Outpatient Treatment for Substance Dependence:

Using Empirical Findings about Retention and Substance Use Outcomes to Shape Treatment Services

By

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ABSTRACT

The literature has indicated that frequently examined patient variables at intake have shown mixed results in the prediction of dropout from outpatient substance abuse treatment. In this research sociodemographic characteristics, substance use and psychological problem severity at intake were examined as predictors of early dropout in 411 patients enrolled in a 6-month outpatient substance abuse treatment program. Early dropout was defined as participation of less than 6 weeks, the first phase of treatment. Another focus of the research was to determine how patients who dropped out of treatment early fared in terms of substance use at 6 months compared to those retained longer. It was found that being younger, unmarried or not cohabitating, and having a greater severity of employment problems at intake were associated with early treatment dropout. Substance abuse and psychological problem severity at intake were not associated with dropout from the first phase of treatment. Patients who left treatment early had some reduction in alcohol consumption at 6-month follow-up, but overall, those retained in treatment longer had better alcohol and drug use outcomes at 6 months. Both the outcomes on retention and substance use were examined in order to explore possible solutions to dropout from the perspective of health services. Despite the improvements in substance abuse for patients retained longer than 6 weeks, it was determined that only 40% of patients were retained for 6 months, thereby indicating that the majority of patients had not received the planned 6-month intervention. In response to these facts, a brief intervention consisting of 5 individual therapy sessions based on coping skills and motivational enhancement strategies was designed and manualized with participation of the clinical staff. Following this, a randomized clinical trial was conducted with 72 patients, and substance use at 6-month follow-up was compared between the brief

intervention and the conventional treatment groups. At 6 months, both the brief intervention and conventional treatment groups had reductions in alcohol use compared to intake, but no conclusions could be made about drug use. The implications of the findings for substance abuse treatment service delivery are discussed.

RÉSUMÉ

Les études révèlent que la probabilité d'abandon de traitement pour abus de substance en milieu externe ne peut être prédit de façon fiable par les variables habituellement recueillit lors de l'entrevue de contact. Cette recherche a examiné les caractéristiques sociodemographiques, l'usage de substance et la sévérité de problèmes psychologiques au moment du premier contact comme pronostiqueurs d'abandon précoce chez les 411 patients inscrits dans un programme de traitement de six mois pour abus de substance en milieu externe. L'abandon précoce fut défini par une participation d'une durée de moins de six semaines, soit la première phase du traitement. Un autre aspect d'intérêt était de connaître l'usage de substances après six mois chez ceux qui abandonnaient en début de la thérapie par rapport à ceux qui sont restés plus longtemps. Les résultats ont montré qu'être plus jeune, célibataire ou de ne pas être en cohabitation et avoir des problèmes d'emploi plus sérieux au moment de l'entrevue de contact étaient des facteurs associés à l'abandon précoce du traitement. L'abus de substances et la sévérité des problèmes psychologiques constatés au premier contact n'étaient pas associés à l'abandon dans la première phase du traitement. Les patients qui avaient quitté le programme thérapeutique de façon précoce avaient quelque peu réduit leur consommation d'alcool au suivie de six mois, mais de façon générale, ceux qui étaient restés le plus longtemps en thérapie avaient de meilleurs résultats thérapeutiques après six mois relatif à leur consommation d'alcool ou de drogues. Les résultats à l'égard de la durée de la thérapie et de l'usage de substances ont été examinés afin d'explorer des solutions possibles à l'abandon précoce de traitement du point de vu des services de santé. Malgré l'amélioration accrue tant qu'a l'abus de substances chez les patients demeurés en thérapie pour une plus longue période, seulement 40% de ces patients ont été retenus pour la durée totale de six mois tel que

prévu. Pour combler à ces lacunes, une intervention de courte durée en raison de cinq sessions de thérapie individuelle basée sur des stratégies de l'augmention de la motivation et le talent d'adaptation, a été conçue et adaptée en manuel avec la participation du personnel clinique. Ensuite un essai clinique, randomisé fut mené avec 72 patients. Au suivi de 6 mois, l'usage de substances a été comparé entre le groupe de thérapie conventionnel et celui de l'intervention de courte durée. Après six mois les deux groupes démontraient une diminution de la consommation d'alcool par rapport à la consommation à la visite de contact, mais aucune conclusion ne pouvait être tirée concernant l'usage de drogues. Une discussion sur l'implication de ces résultats sur le traitement de l'abus de substance suivra.

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Table of Contents

List of Tables

Early Dropout Study

List of Tables

Brief Intervention Study

List of Figures

Early Dropout Study

List of Figures

Brief Intervention Study

Outpatient Treatment For Substance Dependence: Using Empirical Findings About Retention And Substance Use Outcomes To Shape Treatment Services

Introduction

In a climate of escalating health care costs, streamlining and coordinating health and social services and the development and evaluation of effective and efficient treatment interventions in health care are a high priority (Health Canada, 1997; Romanow Commission, 2002). A proactive stance in designing, implementing, and evaluating treatment interventions allows researchers and clinicians to maintain a prominent role in decisions about resource management and future policy directions for treatment (Solesbury, 2001). Knowledge about treatment effectiveness also places clinicians on firmer ground with patients when recommending treatment because valid and reliable information about treatment options can be provided (Pendergast & Podus, 2000; Solesbury, 2001). Although major advances have been made towards improving the treatment of substance use disorders in the past 20 years, there are still many unanswered questions about the effective and efficient delivery of treatment services (Iowa Practice Improvement Collaborative, 2003).

The evidence-based movement with the primary focus on outcomes is currently the dominant paradigm in the assessment of health care (Evidence-based Medicine Working Group, 1992; Davies & Crombie, 1997). Evidence-based decision-making is the systematic application of the best available evidence to the evaluation of options and to decision-making in clinical, management, and policy settings (Health Canada, 1997). The

goal of the evidence-based movement is to develop a body of empirical knowledge of treatment effectiveness and disseminate the information to practitioners in order to improve the quality and efficiency of health care. While research findings pertaining to treatment effectiveness are important to clinicians, they may not translate into concrete changes in existing treatment programs. Barriers to the use of evidence in the health care system include: lack of useful evidence, lack of consensus, inappropriate use of evidence, and lag time in diffusion and uptake of information (Health Canada, 1997).

The field of treatment for substance dependence shares the common concern of the entire National Health Care system about the gap between what is known empirically and what is practiced clinically. Examples of empirically validated treatments for chemical dependence that have failed to gain wide acceptance in practice include: methadone maintenance for opiate dependence, contingency management for cocaine dependence, as well as social skills training, naltrexone (Revia), and brief intervention for alcohol dependence (Miller & Hester, 1986; Miller et al.1995; Miller & Wilbourne, 2002; Carroll & Rounsaville, 2003). In the U.S., methods which remain widely used in the treatment of alcohol dependence are those associated with the 12-Step Minnesota model using the principles of Alcoholics Anonymous, as well as methods of confrontation and education, which have received little empirical support (Miller et. al., 1995; Morgenstern, 2000). Some reasons for the gap between research and practice may be related to methodological issues of treatment evaluation research and the failure of research to connect with clinical settings (Carroll & Rounsaville, 2003). A greater emphasis on effectiveness research conducted in the field has been proposed as a strategy to bridge the

gap between research and practice (Institute of Medicine, 1998). Despite the fact that methods for conducting outcome-based evaluations through randomized controlled trials have been well defined (Rounsaville, Carroll, & Onken, 2001; Prien & Robinson, 1994; Institute of Medicine, 2001), the nature of what constitutes sound effectiveness research for substance dependence treatment is not as straightforward (Carroll, 1997a; Carroll & Rounsaville, 2003). The emerging field of health services research provides some guidelines that can be applied in the evaluation of treatment effectiveness.

Health services research is a discipline that has been evolving over time and several recent definitions provide a description of the field's scope of investigation. Health services research comprises many different activities with differing aims and methods, and includes not only assessment of how effective a treatment is, but also the consequences of the care given for patients and the community as a whole (Crombie, 1996). The Institute of Medicine (1995) stated that "Health services research is a multidisciplinary field of inquiry, both basic and applied, that examines the use, costs, quality, accessibility, delivery, organization, financing, and outcomes of health care services to increase knowledge and understanding of structure, processes, and effects of health services for individuals and populations" (p.3). The Board of the Academy for Health Services Research and Health Policy (Lohr & Steinwachs, 2002) in the U.S. broadened the definition further and proposed that "Health services research is the multidisciplinary field of scientific investigation that studies how social factors, financing systems, organizational structures and processes, health technologies, and personal behaviours affect access to health care, the quality and cost of health care, and ultimately

our health and well-being. Its research and domains are individuals, families, organizations, institutions, communities, and populations" (p.16). These definitions describe a field of research that is well suited to effectiveness research in addiction treatment. Health services research in substance dependence treatment examines the effectiveness of interventions in unrestricted patient populations in clinical settings, and the interventions are evaluated by a range of more general outcomes as well as drug use, including health status, psychological status, and employment status (Booth, Stanton, & Leukefeld, 2001). In addition to examination of interventions that have been shown to be efficacious in randomized clinical trials, health services research can examine innovative interventions focused on prevention, early intervention, or methods to improve access or engagement in treatment (Booth et al., 2001).

Process measures are elements involved in service delivery that can influence the effectiveness of treatment and are sensitive indicators of the quality of care (Crombie & Davies, 1995; Crombie & Davies, 1998). Process is the collective term for all the activities which occur within health care, and covers the means by which patients access care, the investigations and diagnoses made, treatments received, and the method of discharge or referral (Donabedian, 1968). Questions about process ask "What was done?" as well as, "Was the action done well, justified, and in a timely manner?" (Crombie & Davies, 1998). Studies of process provide empirical data about how the treatment will confer a measurable benefit to a treatment-seeking population in actual clinical practice. Studies of process measures may also point to more obvious actions that need to be taken to improve care, but the study of process measures, in contrast with the study of outcome

measures, has been somewhat left behind in the research arena (Crombie & Davies, 1998). The study of performance measures in evaluating addiction services on levels of prevention/education, problem recognition, treatment, and maintenance of change has lagged behind that of other chronic medical conditions (Garnick et al., 2002).

The Problem of Dropout from Treatment and the Question of Optimal Treatment Duration

Unnecessary resource use is a measure of process that is open to investigation, and may be examined in terms of ordering of laboratory tests, radiological investigations, surgical procedures, as well as treatments that are inappropriate or unnecessary (Crombie & Davies, 1998). It has been noted that in Canada, "The health care system is data-rich, and information-poor: there is little that tells management, the public, or providers about the quality of their labours in relation to agreed-upon goals and standards. There are no benchmarks for either utilization (how many procedures should be done in a population) or outcomes (what difference should we expect from a service, what is an acceptable failure rate)" (p.45) (Fyke, 2001). Similarly, in the field of addiction, examination of service duplication or inappropriate treatment is complex due to the wide range and severity of disorders, the multi-faceted etiology of addiction, the co-existence of private and public treatment services, and diverse modalities and philosophies of care. These characteristics of addiction treatment result in a lack of a shared understanding across the field regarding the dynamics of addiction and an absence of agreed upon guidelines and standards that define effective treatment (Institute of Medicine, 1998). The practical questions for a treatment program for substance dependence are how to deliver the most

effective treatment to a wide selection of patients in an efficient manner. These questions require knowledge of what constitutes the "best" treatment, when treatment involves unnecessary use of resources, and if treatment is delivered in the appropriate manner. Both questions of process and outcomes may be addressed in an examination of treatment effectiveness. Despite the lack of consensus about "standard" treatment for addiction, it is possible to measure if the treatment provided was delivered in the way that it was intended. It is also possible to determine if the outcomes support the design of the treatment. The former is a question of process evaluation, the latter one addresses outcomes.

A problem identified in the delivery of services in an outpatient treatment clinic for substance dependence (the Addictions Unit of the McGill University Health Centre) provided the basis for the research conducted herein. Specifically, the problem identified was dropout, which is pervasive across health care settings, but is particularly evident in substance dependence treatment (Stark, 1992). Treatment at the clinic was based on the philosophy that improvement in substance dependence was accomplished over time through a series of behavioural changes facilitated by therapy (Prochaska & Di Clemente, 1992; Wallace, 1992; Tatarsky & Washton, 1992), and treatment services were designed to be administered over a minimum period of 6 months. One study examining rates of attendance of a sample of consecutively admitted patients to the clinic's standard treatment program found that only 40% of patients remained in treatment for the full duration of 6 months (Gauthier, Paraherakis, & Gill, 1997). Those who reported more health problems, had more education, and higher rates of employment, and lower scores

on the Beck Depression Inventory at intake were more likely to complete 6 months of treatment. However, little more was known about the early dropouts, and it appeared that many patients were not participating in the treatment program as it was designed. Clinical interest was sparked by these facts and questions about the potential impact of this problem on treatment effectiveness and efficiency were raised. The clinical team was interested in examining the factors leading to dropout, as well as its impact on treatment effectiveness and service delivery. Traditionally, few researchers have been attracted to the study of dropout and how it affects treatment services, leaving clinicians and policy makers with little feedback about their activities from quantitative research (Mammo & Weinbaum, 1993).

The principal goals of this thesis were to: (a) determine whether patients who left treatment before 6 weeks (Early Dropouts) differed from those who stayed in treatment longer than 6 weeks (Retained) on sociodemographic, substance use, and psychological variables at baseline; (b) determine if additional psychological factors of motivation, self-efficacy, and personality characteristics were associated with early dropout; (c) identify sociodemographic, substance use, and psychological predictors of early dropout; (d) determine whether sociodemographic, substance use, psychological factors, and length of stay in treatment were associated with substance use outcome variables at 6-month follow-up; (e) compare substance use at 6 months between the Early Dropouts and Retained; (f) evaluate treatment services from the perspective of health services criteria of acceptability, equity, effectiveness, and efficiency; and (g) determine the effectiveness of a brief treatment compared to conventional treatment.

The first six objectives were examined within the context of a naturalistic follow-up study. The last objective was addressed within the context of a randomized treatment study specifically designed for this thesis.

Towards these goals, the thesis is divided into eight chapters. The first chapter begins with a general overview of the consequences associated with substance dependence in Canada in order to illustrate the pressing need to examine the effectiveness of existing programs and services for patients who seek treatment for substance dependence. Treatment effectiveness, the problem of dropout, and a review of the literature pertinent to factors influencing retention in treatment and substance use outcomes are also discussed in Chapter 1. The factors reviewed are: demographic characteristics, social support, substance use problem severity, psychological problem severity, and additional cognitive psychological factors. The last section of Chapter 1 presents the study objectives and hypotheses. Chapter 2 describes the methodology, procedures, and statistical plan for the study. Chapter 3 provides the results of the analyses on early dropout, as well as attrition from treatment over time. Chapter 4 reports the results of the analyses on substance use and psychological outcomes at 6 months, with comparisons between the Early Dropouts and the Retained. This is followed by an examination of demographic, substance use, and psychological factors as well as treatment retention to determine if there was an association with substance use outcomes at 6 months. Chapter 5 discusses the results on retention and substance use outcomes, and evaluation of findings from a health services perspective that led to the plan to conduct a brief intervention. Chapter 6 begins with an overview of the literature on brief

interventions in substance dependence treatment, followed by the rationale, study objectives, and hypotheses. Subsequently, the methodology of the brief intervention study is presented. The next section of the chapter presents the results of the brief intervention study. Chapter 7 provides a summary of combined results and discussion with methodological considerations. Chapter 8, the final chapter, presents the conclusions with clinical implications for the treatment of substance dependence and applications as they relate to the health care system.

Chapter 1

The Prevalence of Substance Abuse

Substance dependence is the most prevalent serious mental disorder in North America, with lifetime prevalence rates ranging from 13.5% in U.S. samples (Regier, Farmer, Locke, Keith, Judd, & Goodwin, 1990; Grant et al., 2004) to as high as 18.0% in some regions of northern Canada (Bland, Newman, & Orn, 1992). A more recent survey on the 12-month prevalence of any substance use disorder using DSM-IV (APA, 1994) criteria estimated rates of 9.5% in a representative sample of 43,000 Americans (Grant et al., 2004). An overview of substance use in the Canadian public is provided by the Canadian Addiction Survey (CAS) (CCSA, 2004), the first major survey on the use of alcohol and drugs in Canada since 1994. A total of 13,909 Canadians over the age of 15 across the 10 provinces participated in the telephone survey. The results indicate that the use of alcohol, cannabis, and other drugs has increased in the past decade. Most Canadians drink in moderation, but about 23% exceeded low-risk drinking guidelines defined as 14 standard drinks for males and 9 standard drinks for females weekly. Based on the Alcohol Use Disorders Identification Test (AUDIT) 17% of current drinkers, or 13.6% of Canadians, were considered to be high-risk drinkers. The high-risk drinkers were predominately males under the age of 25. The rate of cannabis use doubled in the past 10 years, and 14% of Canadians reported smoking cannabis in the past year. Although most illicit drug consumption is limited to cannabis, about 3% reported using cocaine or other illicit drugs including heroin, hallucinogens, speed, inhalants, or MMDA (Ecstacy) in the past year.

A provincial report stated that the percentage of people consuming alcohol in Quebec has also been on the rise (CPLT, 2000). Heavy drinking, defined as 5 drinks or more per occasion, more than 5 times a year, was reported by one in 13 Quebecers over the age of 15. Heavy drinking was also more common among males and youths aged 15 to 24.

The CAS (2004) survey found that over 16% of Quebec residents used illicit drugs in the last year, which is the highest prevalence in Canada, and an increase from the 13% reported by the earlier Quebec survey (CPLT, 2000). Cannabis was the most frequently consumed illicit drug, with 70% of drug users consuming marijuana or hashish exclusively. Cocaine was the most frequently injected substance among the 23,000 people in Quebec who used drugs intravenously (Remis et al., 1998). Dual substance dependence was more common in drug abusers who were also the largest consumers of alcohol, drinking regularly and in large quantities (CPLT, 2000).

The Canadian Community Health Survey: Mental Health and Well-Being (Statistics Canada, 2002) found that 10% of Canadians over the age of 15 reported symptoms consistent with a psychiatric disorder during the 12 months prior to the interview. The disorders included: alcohol or drug dependence, depression, mania, panic disorder, agoraphobia, or social phobia. The overall prevalence of substance use has increased across Canada in the last decade, and the costs and consequences of untreated long-term substance dependence will continue to rise and exact a toll on the Canadian health care system, the economy, and community and social life.

The Costs and Consequences Associated with Untreated Substance Abuse

Long-term complications arising from unremitting substance use disorders result in adverse medical, psychological, and social consequences for the individual, family members, and the community. It has been estimated that annually in Canada over 6,000 deaths and 80,000 hospitalizations are associated with alcohol use, and over 800 deaths are caused by illicit drug use (Single, Rehm, Robson, & Truong, 2000).

The CAS (2004) also asked participants about harm to self or others resulting from alcohol and/or drug use. The responses were compared to the 1989 National Alcohol and Other Drugs Survey (NADS)(Eliany, Giesbrecht, & Nelson, 1990) and the 1994 Canada's Alcohol and Other Drugs Survey (CADS)(MacNeil & Webster, 1997). There was a general trend towards more drinkers in 2004 reporting harm from their own or others' drinking compared to the previous surveys. In 2004 close to 10% of current drinkers reported that they experienced negative effects on their health or social lives in the past year. Almost one third of the survey respondents reported that they were harmed in the last year because of someone else's drinking. Individuals experienced family or marital problems (10%), verbal abuse (40%), serious arguments (15%), and physical assault (15%). About 5% of Canadians in the survey reported concern about cannabis use, primarily related to failing to control their use, and a strong desire to consume. For current users of any drugs other than cannabis, the commonly reported negative consequences were harm to physical health, reported by 24%, followed by problems with home, social life, finances, and work. The Canadian picture reflects a similar one in

Quebec, with an 8-fold increase in the risk of social problems for heavy drinkers (Demers & Vallee, 1999).

Research on substance abuse and suicide is rare in Quebec. Tousignant and Payette (1997) summarized findings from key European and North American studies on the association between suicide and substance abuse and extrapolated findings in order to provide a picture of the situation in Quebec. Conservatively, psychoactive substance disorders play a role in 30 to 50% of all suicides (Lesage et al., 1994; Henriksson, Aro, Marttunen, & Heikkinen, 1993). Approximately one quarter of people who commit suicide have an alcohol disorder, and the average duration of alcoholism before suicide is 19 years (Murphy & Wetzel, 1990). Cocaine users were found to be at 45 times higher risk of committing suicide than the population without a substance use or psychiatric disorder (Marzuk, et al., 1992).

The consequences resulting from substance dependence disorders including morbidity, mortality, motor vehicle accidents, legal problems, suicide, family dysfunction, and lost employment place a heavy burden on the Canadian economy and the health care system (Choi, Robson, & Single, 1997). The total cost of tobacco, alcohol, and drug dependence to the Canadian economy has been an estimated $18.45 billion annually (Single et al., 1996). The Canadian Community Mental Health Survey (Statistics Canada, 2002) reported that mental disorders including substance use disorders were the third highest source of direct health care costs after heart disease and cancer. It was estimated that the total cost of tobacco, alcohol and drug abuse in Quebec alone was 4.4 billion annually (Desjardins, 1997). The majority of Quebec government funds delegated

to substance abuse was spent on hospitalization for the medical and psychiatric sequelae of substance use disorders, with less than 10% of funding provided for specialized treatment services. As health care and social service costs continue to escalate, and scrutiny about resource allocation increases, provision of empirically supported treatments has become a major objective of the health care delivery system.

Clearly, the consequences of untreated substance use disorders result in tremendous health, social, and economic costs that touch all levels of society. Of key importance is the fact that drug and alcohol consumption in the Canadian population is on the rise, and many of the severe consequences such as illness, death, or violence occur at the end of a long trajectory of chronic use and relapse. Effective treatment intervention has a major role to play in the reduction and prevention of long-term negative consequences for the individual and the community at large.

The next section outlines what is known about treatment effectiveness and discusses factors associated with retention and substance use outcomes.

Background Literature Review and Rationale for the Present Studies

Treatment for Substance Dependence: Factors Influencing Outcomes

The issue of treatment efficacy is of utmost importance to all medical and psychosocial services. Positive outcomes associated with treatment for substance dependence include decreased hospitalizations, emergency room visits, motor vehicle accidents, and traffic and criminal offences (Hoffman & Miller, 1993). Numerous reviews have identified a set of treatment approaches with positive outcomes for alcohol

problems, including cognitive behavioural therapy, behavioural couples therapy, behavioural self-control, brief interventions, community reinforcement, and social skills training (APA, 1995; Miller et al., 1995; Roth & Fanagy, 1996; Miller & Wilbourne, 2002). Miller & Wilbourne (2002) reviewed 46 different treatment modalities for alcohol dependence and found that brief interventions, social skills training, and community reinforcement were among the top 5 empirically validated treatments in clinical populations. However, Miller & Wilbourne's criteria for rating studies automatically inflated the effect sizes of studies with a placebo or no-treatment control group, thereby placing studies with two active treatments comparisons, the research design typically used in clinic settings, at a disadvantage in their rating system.

The Task Force on Promotion and Dissemination of Psychological Procedures of the American Psychological Association (Chambless et al., 1996), failed to identify any empirically validated or probably-efficacious treatments for alcohol-use disorders (McCrady, 2000). The report of the Task Force in 1996 did include 4 treatments for substance use disorders that were listed as probably-efficacious: contingency management for cocaine abuse (Higgins et al., 1993), brief dynamic therapy and cognitive therapy for opiate dependence (Woody, Luborsky, Mclellan, & O'Brien, 1990), and cognitive-behavioural therapy for benzodiazepine withdrawal in panic disorder patients (Otto, Pollack, Sachs, Reiter, & Rosenbaum, 1993; Spiegel, Bruce, Gregg, & Nunzello, 1994). McCrady (2000) applied the criteria of the Task Force to her own review of 62 studies of treatment conducted in the alcoholism field up until 1998 and found that only 2 of the 13 treatment modalities studied—brief intervention and relapse

prevention—met the Task Force criteria of empirically validated treatments. Motivational enhancement therapy met criteria for a probably-efficacious treatment. For these 3 treatments, definitive studies meeting the Task Force criteria were published after 1996, demonstrating that research methodology in the study of alcoholism treatment has only recently met rigorous criteria.

Based on reviews of drug dependence treatment in the U.S., it has been shown that those who attend treatment have reduced drug use and crime, as well as improved social adjustment, employment, family relationships, and psychological adjustment, and that treatment efficacy is positively related to the length of time spent in treatment (National Institute on Drug Abuse, 1999; Etheridge & Hubbard, 2000; Pendergast & Podus, 2000). Despite many positive reports of outcomes, there is still considerable variability in a wide range of outcomes from substance use to psychosocial measures within given treatment modalities (McLellan et al., 1994; Breslin, Sobell, Sobell & Sobell, 1997). These variations may be related to patient differences, program management, staffing, treatment delivery, measurement of outcomes, and these factors deserve consideration before drawing conclusions regarding treatment outcomes (Etheridge & Hubbard, 2000; Schildhaus, Gerstein, Dugoni, Brittingham, & Cerbone, 2000).

The question "Is treatment effective?" is too general and needs to be reduced to questions of "What treatment?", "What problem?", "What patient?", and "What outcome?" (Roth & Fanagy, 1996). The following section summarizes commonly studied

factors and their association with effectiveness for substance dependence treatment in outpatient settings.

Overview of Factors Associated with Treatment Outcomes in Outpatient Settings

Over the past three decades, the literature on treatment outcomes for substance use disorders has burgeoned. A review of outcome variables in 357 alcohol treatment trials from 1968 to 1998 concluded that "Overall, the variety of outcome variables assessed in alcohol treatment research makes it difficult to compare results across studies and to identify 'best' treatment approaches" (Finney, Moyer, & Swearington, 2003, p.1677). Due to the vast number of studies on alcoholism, Miller and Wilbourne (2002) point out that it has been necessary to summarize the outcome literature by categories focusing on specific clinical issues, examining subsets of treatment approaches, or by conducting meta-analyses. Evaluation of outcomes for drug use disorders has followed a similar trend, with examination of patient variables, certain clinical features, type of treatment program, specific drug of abuse, program structure, and more recently, measures of the patient-treatment process, resulting in a wide array of predictor and outcome variables (Etheridge & Hubbard, 2000).

Etheridge and Hubbard (2000) proposed a seven-level empirically grounded framework that involves a multidisciplinary approach for the study of drug dependency treatment structure and process. The seven levels of variables and factors are: external policy environment, treatment and service systems, structural and operational features of the program, treatment/service interventions, patient characteristics, patient social environment, and patient outcomes. Since it is not possible for all variables to be studied

in a single research project, the framework provides the investigator with a mechanism for selection of variables of greatest research, policy, and practice interest, as well as a context for discussion and interpretation (Etheridge & Hubbard, 2000).

The two first levels of variables chosen for the present study were patient characteristics and patient outcomes, and results from these analyses were then examined for their implications on a third level, that of treatment and service systems. The literature review that follows is described in the context of determining what is known about some of the most frequently examined predictors of retention and substance use outcomes in outpatient treatment for substance dependence. These predictors include sociodemographic characteristics, social support, substance use problem severity, psychiatric comorbidity, and additional psychological factors of motivation, self-efficacy, and personality features.

Treatment Retention - The Definition and Prevalence of Dropout

Comparison of dropout rates across studies is problematic because different time frames are used to distinguish dropouts from completers based on the design and length of the specific treatment program under study (Stark, 1992). Due to the variable definitions of dropout based on duration, a definition that combines therapist judgment of appropriateness of termination plus a time classification that distinguishes early from later dropouts may be more comprehensive (Pekarik & Zimmer, 1992). This combined definition allows examination of predictors that are associated with dropout at different stages. The literature indicates that factors associated with early and later dropout may differ, with early dropouts being younger and less socially stable in terms of employment

and living situation (Pekarik & Zimmer, 1992; Gottheil, Sterling, & Weinstein, 1997; Gottheil, Weinstein, Sterling, Lundy, & Serota, 1998). Differences between early and later dropouts on the degree of psychological distress have been inconsistent, with some studies finding that those less distressed were likely to leave treatment early (Siqueland et al., 1998), while others have found the opposite (Simpson, Joe, Broome, Hiller, Knight & Rowan-Szal, 1997).

The actual number of dropouts in any given study is often omitted or unclear. In a study of treatment methodology it was determined that only half of the 61 alcohol treatment studies reviewed from 1989 to 1993 provided attrition rates (Breslin et al., 1997). However, it is universally known that many who start treatment drop out early, before receiving planned interventions (Stark, 1992). Due to the divergent definitions of dropout, different populations studied, and different expectations of participation across treatment modalities, comparisons of the rates of retention across studies do not provide yardsticks for clinicians to measure success of their programs.

Why Examine Dropout?

The basic and pragmatic question " Why does treatment attrition matter?" deserves a response prior to an examination of dropout in substance dependence treatment. The answer is three-fold. As described in the Introduction, there are long-term negative consequences of untreated substance abuse, and the first reason to examine dropout is that an association between positive outcomes and longer stays in treatment has been found. The second reason to examine dropout is that high attrition rates cast doubt on the positive reports of outcomes from treatment. The third reason to examine

dropout is related to a health care perspective of inefficient use of treatment services that are designed with longer treatment goals. Each reason is briefly outlined in the following section.

The Association Between Treatment Retention and Reduced Substance Use

Although no causal relationship can be drawn, links between treatment retention and reduction of substance use have been found in the majority of studies (Mammo & Weinbaum, 1993; Hubbard, Craddock, Flynn, Anderson, & Etheridge, 1997; Gottheil et al., 1998 ; Siqueland et al.1998; Etheridge & Hubbard, 2000; Hubbard, Craddock, & Anderson, 2003). The following discussion provides more detail about studies that have reported an association between improved substance use outcomes and time spent in treatment.

In a study examining factors associated with dropout from outpatient treatment for alcoholism it was found that those who completed treatment had significantly greater reductions in drinking, improved health status, and marginal improvements in family situations and legal status compared to noncompleters (Mammo & Weinbaum, 1993). The study was an examination of admissions and discharges from the New Jersey State Department of Health Division of Alcoholism, Drug Abuse and Addiction Services and was based on outpatient treatment services for patients admitted and followed up to one year. Treatment was considered "completed" when the patient finished the initially agreed upon treatment plan or a revised plan that was developed while treatment was in progress. If a patient left against staff advice or contact was lost, the person was considered a dropout. Forty-nine per cent of the males completed treatment, and at

follow-up 67% of the completers were abstinent and 25% had reduced their drinking. Among the male dropouts, 35% were abstinent and only 7.8% had reduced their drinking. Among the female subjects, only 37.8% were defined as treatment completers. Of these, 74% had stopped drinking compared to 42% of the dropouts. In summary, 92% of the completers and 44% of the dropouts had improved their drinking status at one-year follow-up.

The Drug Abuse Treatment Outcome Study (DATOS) was a prospective epidemiological study that examined correlates of treatment outcome and effects by subgroups of patients. Four treatment modalities including short-term inpatient, methadone maintenance, long term residential, and outpatient drug free, as delivered in 76 programs across the United States, were examined (Hubbard et al., 1997, Etheridge & Hubbard, 2000; Hubbard, Craddock, & Anderson, 2003). Only the outcomes for retention in the Outpatient Drug Free (ODF) programs (N = 24) are described here (Hubbard, et al., 1997; Hubbard, Craddock, & Anderson, 2003). More detail about this large scale study is provided below.

Patients were assessed at intake, at 7 to10 days into treatment, and at 1, 3, and 6 months of treatment. An additional interview was conducted at the 12-month follow-up. The overall one-year follow-up rate was 70%, resulting in 764 subjects being interviewed from the 24 ODF programs. Cocaine was the primary substance of abuse, and many patients were also drinking and smoking cannabis as well. At one-year follow-up, cocaine and alcohol use were reduced by 50%, and less than 10% reported weekly or more frequent use of marijuana, compared to 25% at intake. The follow-up sample was further

divided into categories of those who remained in treatment < 3 months (N = 240), and those who stayed in treatment > 3 months (N= 524) in order to examine the association between treatment duration and substance use outcomes. Of those who remained in treatment < 3 months, 55% were still using cocaine, 53% had some drug use, 15% were using alcohol, and over half had spent some time in jail. Of those who remained in treatment > 3 months, only 28% were still using cocaine, 19% had some drug use, 9% were using alcohol, and one quarter had spent some time in jail. The results indicated that longer stays in outpatient treatment were significantly associated with improved substance use, social, and behavioural outcomes.

There are limitations to the DATOS reports on ODF treatment including the fact that there was no control and monitoring of treatment or randomization to treatment condition, and that substance use outcomes cannot be attributed to treatment per se. However, the association of improved outcomes with longer time spent in treatment deserves further consideration. One-year follow-up data from the DATOS group indicated that 3-month retention was associated with improved substance use outcomes in the ODF programs (Hubbard et al., 1997), and 5-year follow-up data indicated that 6 months of treatment was associated with reduced cocaine use in both Long-Term Residential (LTR) and ODF programs (Hubbard, Craddock, & Anderson, 2003). Thus, better treatment retention overall is generally associated with improvement in substance use outcomes at longer follow-up periods.

Randomized clinical trials have also found a positive association between improved substance use outcomes and treatment retention. More session attendance and

longer retention in outpatient treatment for cocaine abuse in a publicly funded inner-city program in Philadelphia were associated with better substance use outcomes (Gottheil et al., 1998). In this randomized controlled trial comparing the effectiveness of intensive outpatient treatment with individual counselling there were no significant differences among three treatment conditions of varying intensity, but those who stayed in treatment longer had better substance use outcomes. At 9-month follow-up patients who remained in treatment more than 6 weeks had an average reduction of 75% in the number of days of cocaine use in the previous month, compared to a 50% reduction for those who remained in treatment for less than 6 weeks. Those who attended more treatment, in addition to a significant reduction of cocaine and alcohol problems, also had reduced employment and psychological problems, and were more likely to be attending self-help meetings, continuing in outpatient treatment, or school.

Another randomized trial study compared the effectiveness of high standardization cognitive-behavioural treatment, low standardization CBT, and treatment as usual for substance abuse in a community setting (Morgenstern, Blanchard, Morgan, Labouvie, & Hayaki, 2001). All three treatment conditions consisted of 12 weekly individual therapy sessions. At 6-month follow-up the average increase in percentage of days abstinent from cocaine was 30%, and although no significant differences across the three treatment conditions emerged, those who attended more sessions in any of the conditions had improved outcomes.

Although longer stays in treatment have been linked to improved outcomes, the conclusions drawn about treatment effectiveness require skepticism because high dropout

rates may result in data provided by a select group of patients at follow-up.

The Effect of Dropout Rates on Evaluation of Treatment Efficacy

Dropout rates have a major impact on the quality and reliability of data gathered in clinical trials because missing data are non-random and can lead to distortion or biases in outcome results (Lavori, 1992; Harris, 1998; Nick & Carroll, 2002).

Details of the dropout rates in the following study are provided because they illustrate how attrition over time reduces the sample to a select set of participants who may not be representative of the original treatment-seeking group of patients.

A multi-site randomized psychotherapy outcome study for patients with cocaine dependence funded by the National Institute on Drug Abuse (NIDA) examined predictors of dropout from psychosocial treatment of cocaine dependence (Siqueland et al., 1998). Prior to treatment initiation, attrition of eligible participants occurred after telephone screening, the first interview, and during the stabilization phase that was required pre-randomization. Of 1386 patients who were eligible for the study, a little more than half came for the initial interview, and another 13% were lost before beginning the stabilization phase. Completion of the 20-day stabilization phase required attendance to an average of 3 individual sessions per week and provision of 3 consecutive drug-free urine screens as a prerequisite for randomization to the study treatment. Only 46% of patients (286) completed this phase and were randomized to treatment. The dropout rate from the time of initial telephone screening to randomization into the study was 84%. Furthermore, only half of the randomized patients in the three treatment conditions completed the full 6 months of treatment, with dropout rates of 15% at 1 month, 33% by

the third month, and 49% by the sixth month. Recognizing the impact of missing data and the selection bias that resulted from these high rates of dropout, the investigators changed the prerequisites of abstinence and reduced the session attendance required during the stabilization phase in order to engage more patients in future research.

Due to high rates of attrition throughout treatment and study protocols, resulting in loss of follow-up data, outcomes examined may be based on only a fraction of patients who originally applied for and were adherent to treatment, thereby overestimating optimistic outcomes.

The Effect of Dropout from the Perspective of Health Services

Retention can be conceived of as an important treatment outcome that reflects a "good fit" between the patient, therapist, treatment, and setting (Carroll, 1997). Despite the caution required to interpret the association between treatment and positive outcomes, treatment utilization may be considered as an intermediate end-point to the goal of improving outcomes (Booth et al., 2001).

Although the association between more time in treatment for drug dependence and better outcomes has generally been accepted by researchers and policy makers, the validity of these conclusions has been questioned on the basis of lack of control for self-selection (De Leon, 1998). Patients who seek treatment for substance dependence differ from those who do not (Sobell, Ellingstad, & Sobell, 2001), and those who remain in treatment differ from those who leave. De Leon (1998) describes self-selection as a concept in research methodology that refers to factors that affect sample bias, but in treatment, refers to individual differences in seeking, engaging or remaining in treatment.

In fact, active "treatment shoppers" have shown better outcomes in psychotherapy than passive recipients (Seligman, 1995). Treatment effectiveness, defined by outcomes of retention and reduction of substance abuse, reflects a dynamic and interactional process between patient self-selection factors and treatment factors (Miller, 1985; De Leon, 1998). Understanding more about patient characteristics that may be associated with choices for leaving treatment, or dropout, also necessitates an examination of the treatment services provided. Describing rates of dropout without examining the quality and appropriateness of services leaves out elements that are useful for further understanding of factors influencing dropout. It has been suggested that rather than the usual negative view of treatment attrition, from a services perspective, substance abusers seeking treatment may be regarded as requiring a range of services that may not necessarily be met in a single treatment episode (Booth et al., 2001).

Although the definitions and rates of dropout may vary, dropout in treatment is a universal fact that raises doubt about the positive outcomes associated with treatment since only a fraction of people who seek treatment actually complete it. From a health services perspective, knowing more about dropout helps to determine if treatment services are being utilized in the manner in which they were designed, and are benefiting a wide range of patients in the best manner possible.

In the following section, a summary of the most commonly examined predictors of outpatient treatment retention and substance use outcomes is provided.

Predictors of Retention and Substance Use Outcomes

There are few consistent findings demonstrating a clear relationship between

sociodemographic characteristics and dropout and substance use outcomes, but there are some trends that can be described.

Age: Age is a characteristic that can be confounded with other factors including problem severity. Hser, Grella, Hsieh, Anglin, and Brown (1999) found that older patients were often more treatment-experienced, had more severe substance use and social problems, were less likely to follow program instructions, and attended less individual counselling sessions. Subjective ratings of problem severity may be less for those who are younger since they may have had fewer years of problem use. Although several studies found no association between age and early dropout (Pekarik & Zimmer, 1992; Gottheil et al., 1997; McCaul, Svikis, & Moore, 2001), it has frequently been observed that younger patients tend to drop out of outpatient treatment sooner and have poorer treatment outcomes (Mammo & Weinbaum, 1993; Siqueland et al., 1998; Joe, Simpson & Broome, 1998; Grella, Hser, Joshi, & Anglin, 1999; Monras & Gual, 2000; Neilsen, Nielsen, & Wraae, 2000; Harrison & Ashe, 2001).

Gender: Caution is also needed when drawing conclusions about gender and dropout from substance abuse treatment since many studies have had a small proportion of female patients and difficulty gathering an adequate sample size for analysis (McCaul et al., 2001). A number of studies found an association between female gender and early dropout from outpatient substance abuse treatment (Anglin, Hser, & Booth, 1987; Arfken, Klein, di Menza, & Schuster, 2001; McCaul, et al., 2001; Mammo & Weinbaum, 1993). Other studies found no differential dropout rates for males and females (Kleinman et al., 1992; Gottheil, Sterling, & Weinstein, 1997; Pekarik & Zimmer, 1992), or that

females stayed longer in treatment (Monras & Gual, 2000). The lack of gender-sensitive treatments could have an effect on retention in outpatient treatment for women (Vanicelli, 1984; Institute of Medicine, 1990; McCaul et al., 2001; Office of Applied Studies, 1997). One randomized controlled trial found that females treated in a women specific program had higher rates of treatment completion and reported improved substance use outcomes (Dahlgren & Willander, 1989). Gender may also be confounded with problem severity. It has been noted that women may do less well in treatment because they have more severe social, substance use, and psychiatric problems at intake (Arfken et al., 2001; Harrison & Asche, 2001; Brown, Seraganian, & Tremblay, 1994). Whereas male retention is strongly related to personal factors such as social stability, female retention is more often related to treatment factors like service modality and help for health-related problems (Stark, 1992; Kingree, 1995).

Socioeconomic Status: The classification of socioeconomic status differs from study to study. Usually, a combination of factors including educational background, income, and occupation comprise socioeconomic status. More education, higher income, and employment have been found to be positively correlated with retention in outpatient treatment (Mammo & Weinbaum, 1993; Siqueland et al., 1998). Using state archival data, Pekarik and Zimmer (1992) examined discharge records for 1,424 consecutively terminated outpatients who had been treated for alcohol-related problems in state public community mental health drug and alcohol programs. Although the single strongest predictor of outpatient treatment completion was referral by the criminal justice system, social class variables of higher income and education were also strongly associated with

continuance in treatment. In a study examining treatment outcomes for adult outpatients in the state of Minnesota, lower severity of substance abuse, older age, higher education, and white race predicted treatment completion (Harrison & Asche, 2001).

Socioeconomic status will likely be relevant to dropout if factors related to personal, financial, and cultural needs limit the accessibility and availability of resources required to continue in treatment. If the treatment program offered presents barriers to attendance and does not address the special needs of patients including childcare, language flexibility, social services, scheduling flexibility, and financial assistance, it may be more likely that premature termination will occur. Those who have less stable social, employment, and living situations tend to have poorer treatment outcomes, but these factors may also be confounded by problem severity.

The findings for demographic characteristics as predictors for substance use outcomes in most studies parallel those for dropout from treatment. Those who are younger (18 to 35 years old), unmarried, or residentially unstable tend to have poorer treatment outcomes (Ornstein & Cherepon, 1985; McLellan et al., 1994, Phibbs, Swindle, & Racine, 1997; Hendryx, Dyck, & Strebnik, 1999; Moos, Moos, & Finney, 2001; Moos, Nichol, & Moos, 2002). There is some evidence that those who are less educated may have poorer treatment outcomes (Ornstein & Cherepon, 1985; McLellan et al., 1994), but this may be confounded by factors related to program structure and treatment delivery.

Social Support: Despite the assumption that many substance abusers are isolated and estranged from family, it was found that most were in close contact with a family member at least weekly, and many lived with or saw a family member daily (Stanton,

1997). Cocaine users living alone were more likely to leave treatment early compared to those living with others (Gainey et al., 1993), and those who were married were more likely to remain longer in treatment (Carroll et al., 1994; Moos, Nichol, & Moos, 2002).

A naturalistic follow-up study of 206 patients conducted at the Addictions Unit of the McGill University Health Centre (MUHC) found that patients who had more social support stayed in treatment significantly longer. However, higher levels of social support failed to predict reduction in drug abuse, and accounted for only 6% of the variance in outcomes for reduction of alcohol abuse at 6-month follow-up (Dobkin, De Civita, Paraherakis, & Gill, 2002).

Social support is a complex construct and a distinction between the general quality of social support and specific support for reduced substance use may help clarify some of the contradictory findings in the literature (Beattie & Longabaugh, 1999). Alcoholics highly committed to relationships with others who provided low support for abstinence were more likely to experience problems during recovery (Longabaugh, Beattie, Noel, Stout, & Malloy, 1993). While general friendship quality may be important for overall well-being, friends' support for abstinence is a better predictor of substance use behaviour (Beattie & Longabaugh, 1997; Humphreys, Mankowski, Moos, & Finney, 1999).

Problem Severity: Some studies have found that those with more severe drug or alcohol problems leave outpatient treatment sooner (Stark, 1992; Gainey et al., 1993; Simpson, Joe, Broome, Hiller, Knight, & Rowan-Szal, 1997; Joe, Simpson, & Broome, 1999; Mulvaney, Alterman, Boardman, & Kampman, 1999). It could be that the

consequences of substance abuse including health, financial, social, psychiatric, and legal problems interfere with treatment attendance. It is also possible that treatment programs with a goal of abstinence overtly or covertly discourage those with more severe substance use from attending since they are unable to achieve this goal early in treatment (Marlatt, Tucker, Donovan, & Vuchinich, 1997). Lack of agreement between patient and treatment provider about the goals of treatment could play a role in the patient's early departure from treatment. Although retention, engagement, and adherence are problems inherent in the treatment of all medical and mental disorders, the nature of substance abuse disorders presents some especially challenging obstacles for retention. Many people seek treatment in order to eliminate the negative consequences of substance abuse, but not to stop using drugs and alcohol altogether (Onken, Blaine, & Boren, 1997).

Cocaine abusers have been noted to be difficult to retain in outpatient treatment, with drop-out rates increasing dramatically as the treatment progresses (Kleinman, Kang, Woody, Kemp, & Millman, 1992; Gainey, Wells, Hawkins, & Catalano, 1993; Covi, Hess, Schroeder, & Preston, 2002), although there have been some promising results for increasing retention with contingency management approaches (Higgins et al., 1991; Higgins, Budney, Bickel, Hughes, Foerg, Badger, 1993; Roozen, Boulogne, van Tulder, van den Brink, De Jong, Kerkhof , 2004).

Some cocaine dependent patients may leave treatment early because they are unable or unmotivated to achieve abstinence. Several studies have reported that urine toxicology positive for cocaine on the first test was predictive of outpatient treatment attrition for cocaine abuse, indicating that those with a more severe problem may be

unable to achieve even a very short period of abstinence prior to treatment (Higgins, Budney, Bickel, Foerg, Donham, & Badger, 1994; Alterman, McKay, Mulvaney, & McLellan, 1996; Mulvaney, Alterman, Boardman, & Kampman, 1999). It may be that continued participation in treatment is related to early success in treatment. Remission from cocaine and alcohol dependence during a 4-week intensive outpatient program for male veterans predicted greater participation in aftercare (McKay, McLellan, Alterman, Cacciols, Rutherford, & O'Brien, 1998), and corroborated other reports that continued substance use early in treatment has a negative impact on treatment completion (Alterman et al., 1996; Siqueland et al., 1998). Those who are more severely dependent on cocaine and alcohol may opt for self-help attendance over formal treatment that requires ongoing abstinence as a condition of participation (Carpenter, Miele, & Hasin, 2002).

A study of 239 patients admitted for treatment at the Addictions Unit of the MUHC examined primary drug as a predictor of treatment retention (Paraherakis, Charney & Gill, 2000). Five drug categories were compared for treatment attendance and substance use outcomes at 6 months. These categories were: alcohol, alcohol +, cocaine, opiates, and sedatives. The results at 6 months indicated that retention in treatment was significantly different among drug groups. The primary substance of abuse was the largest predictor of dropout. In the opiate group, 52% dropped out of treatment within the first month, compared to dropout rates of 15% to 35% for the other drug groups. The opiate group also had significantly higher rates of positive urine screens compared to the other drug groups. The study showed that the first month of substance abuse treatment

seemed to be critical for longer-term recovery, and that primary substance of abuse was a factor associated with retention and substance use outcomes.

Greater severity of substance abuse has been associated with poorer substance use outcomes at follow-up (McLellan et al., 1994). In a study examining problem severity related to substance use outcomes McLellan et al. (1994) reviewed data from a total of 22 inpatient, outpatient, and methadone maintenance programs in the Philadelphia area. The authors reported no significant differences in outcomes between inpatient and outpatient treatment, and most of the analyses were conducted on three primary drug groups of opiates, cocaine, and alcohol, irrespective of treatment modality. The outcome variables used were the composite scores from the 6-month Addiction Severity Index. For both the inpatient and outpatient groups, greater severity of alcohol and drug use at admission was associated with greater post-treatment substance use at 6-month follow-up. Polydrug use has also been associated with less improvement of substance abuse at follow-up. It was found that patients dually-addicted to alcohol and cocaine had lower rates of abstinence compared to those with a primary drug problem of either alcohol or cocaine (Gainey et al., 1993; Brower et al., 1994).

McKay & Weiss (2001) reviewed 12 major studies of alcohol and drug treatment in order to summarize outcome predictors at long-term follow-up. The most frequently examined baseline predictor was severity of drug and alcohol use, described in 45 out of 100 reports reviewed. Pretreatment severity of substance use was related to outcomes in 30 out of 45 reports, and greater severity predicted worse outcomes in 20 studies, but better outcomes in 6 reports. McKay & Weiss underlined the challenge of interpreting

outcomes across studies due to methodological differences and multiple outcomes and measures.

Psychological Problem Severity and Distress: Some studies have found an association between severity of psychological problems at admission and poor treatment retention. A Danish study examined factors associated with retention for alcoholics in outpatient treatment (Neilson et al., 2000). Participants were randomly assigned to two different 12-month individual treatment conditions of high or low structure. The results indicated those who had higher scores on the Addiction Severity Index psychological composite severity score were less likely to complete the 4-week motivational phase of the program, regardless of treatment condition. Other investigators determined that psychological distress was not associated with dropout from treatment (Gottheil et al., 1997; McKay et al., 1998). In a randomized clinical trial of intensive outpatient treatment for cocaine dependence, it was found that 27% of those who had agreed to participate dropped out before beginning treatment (Gottheil et al., 1997). These pre-treatment dropouts were compared to patients who came to at least one treatment session. The investigators found that the pre-treatment dropouts had more recent cocaine use, less stable employment, less severe medical problems, and significantly lower scores on interpersonal sensitivity, obsessive–compulsive, phobic anxiety, and psychoticism on the SCL-90 subscale scores. When pretreatment dropouts were compared to those who stayed in treatment for at least 2 months, the differences were even more pronounced on the SCL-90 subscales. The pre-treatment dropouts were less psychologically distressed.

In the review of factors predicting long-term outcomes for substance abuse

treatment McKay & Weiss (2001) found that psychological problem severity was significantly associated with substance use outcomes in more than 70% of the studies. Of the 20 reports with significant findings, greater severity predicted worse outcomes in 13, but better outcomes in 4. In 3 studies, psychological problem severity yielded significant interaction effects with treatment condition, but no main effects.

Psychiatric Diagnoses: In a DATOS study, investigators found that those with concurrent DSM III-R Axis I and II diagnoses had shorter retention in an outpatient aftercare treatment for veterans with alcohol and/or cocaine dependence (Simpson, Joe, Broome, Hiller, Knight, & Rowan-Szal, 1997). Other investigators (McLellan, Luborsky, Woody, O'Brien, & Drugley, 1983; Rounsaville, Dolinsky, Babor, et al., 1987) have reported that a high level of psychopathology at intake was associated with poorer treatment outcomes in alcoholics, but this finding is not universal (Tidey, Mehl-Madrona, Huggins, & Badger, 1998). However, integrating conclusions across studies about psychiatric severity as a predictor of substance use outcomes is problematic since various indices of psychiatric symptomatology and diagnoses examined among studies may, to some degree, account for the diverse and inconsistent findings.

Depression: The study of depression as a predictor of dropout and substance use outcomes has also led to mixed results. McKay et al. (1998) failed to find an association between lifetime and current diagnosis of major depression or anxiety and retention. However in this study, veterans had to have stable living conditions and complete the intensive outpatient therapy in order to be eligible for the aftercare program, and those with more severe depression may have been excluded. The NIDA randomized clinical

trial examining predictors of dropout from outpatient cocaine treatment described earlier found that early dropouts had higher scores on the Beck Depression Inventory and the Hamilton Depression Rating Scale (Siqueland et al., 1998). It was suggested that it may be difficult for depressed patients to initially engage in treatment, but that they could be more motivated to continue if they received additional support and treatment for depression or other psychiatric disorders.

In fact, the provision of appropriate mental health services during treatment and appropriate referrals post-treatment for those with psychiatric disorders, has been shown to improve substance use outcomes (Moos, Nichol, & Moos, 2002). In a study of outcomes in 15 Veterans Affairs substance programs, Ritsher, Moos & Finney (2002) examined the relationship of patients' age, education, marital status, motivation, severity of substance use, severity of psychiatric problems, and substance-related cognitions at intake to remission at two years. Remission was defined as abstinence from illicit drug use and either abstinence or non-problem use of alcohol. In contrast to findings at the1-year follow-up point, severity of psychiatric problems was negatively associated with remission at two years (Ouimette, Gima, & Moos, 1999). The authors also examined whether continuing outpatient mental health care during the first follow-up year predicted remission at two years. They found that half of the patients who received 12 months of outpatient treatment were in remission compared to one third who received 5 to 11 months of treatment, and one quarter who received 4 months of treatment. The authors also found that the overall duration of additional outpatient care was more predictive of positive outcomes than the intensity and total number of sessions.

Another study conducted Addictions Unit of the MUHC examined the effect of a current diagnosis of depression on treatment retention and change in substance use (Charney, Paraherakis, & Gill, 2001). The participants were 75 men and 45 women seeking treatment for substance use disorder. The patients were assessed for depression at intake with the Beck Depression Inventory, Hamilton Rating Scale for Depression, Symptom Checklist-90, and a psychiatric evaluation using the SCID and DSM-IV criteria. During the 6-month treatment depressed patients received more treatment in the form of psychiatric appointments, initiation of new antidepressant regimes, and inpatient detoxification than non-depressed patients. Substance use outcomes were equivalent for depressed and non-depressed patients at 6-month follow-up. The study illustrates that the provision of appropriate and timely psychiatric interventions, in addition to standard addiction treatment, may improve substance use outcomes for depressed patients with substance abuse disorders. Substance abuse treatment services vary in their assessment and expertise in the treatment of psychiatric comorbidity, and variations in the availability of services targeted to meet patients' needs may account for inconsistent results in terms of the association between severity of psychological problems, retention, and substance use outcomes (Alterman & McLellan, 1993; Simpson et al., 1999).

Personality Disorders: The association between personality features and retention in treatment and substance use outcomes is complex and not well understood. DSM-IV Axis II disorders have frequently been found to co-exist in patients with substance dependence and may predict poorer treatment outcomes (Pettinati, Pierce, Belden, & Meyers, 1999). A number of studies have found that a diagnosis of personality disorder

predicts poorer outcomes for alcoholics (Verheul, van den Brink, Hartgers, 1998; Brutscheidt, Redner, Schwarz, & Gabel, 2002), drug dependent individuals (Compton, Cottler, Jacobs, Ben-Abdallah, & Spiznagel, 2003), and a mixed sample of drug and alcohol abusers (Galen et al., 2000). More specifically, the presence of antisocial and borderline personality disorder has been associated with poorer substance use outcomes (Wolwer, Burtscheidt, Redner, Schwarz, & Gaebel, 2001; Links, Heslegrave, Mitton, van Reekum, & Patrick, 1995; Compton et al., 2003).

Clinicians in alcohol and drug populations frequently miss the diagnosis of personality disorders, but these patients may be more challenging to engage in the treatment program (Bowden-Jones, Iqbal, Seive Wright, Judd, & Weaver, 2004). Rather than a global diagnosis of personality disorder, it may be more meaningful to understand how certain personality traits are associated with dropout from treatment. Livesley, Jang, and Vernon (1998) developed a four-factor model of personality based on principal component analysis of 18 lower-order dimensions of personality from twin, clinical, and nonclinical samples. The four higher-order personality factors that emerged were: emotional dysregulation, dissocial behaviour, compulsivity, and inhibition. In a subsequent study, a subset of traits delineating antisocial personality was found to be influenced by genetic factors in common with alcohol abuse (Jang & Livesley, 2000). This research is pertinent to the study of addiction because of the multi-faceted etiology of addiction involving genetic as well as environmental influences. For the purpose of the present study, personality factors of antisocial behaviour as well as emotional dysregulation, which broadly resembles borderline personality disorder, were examined

to determine if patients with high scores on these factors were more likely to drop out of treatment early.

Additional Psychological Factors of Motivation and Self-Efficacy: Self-selection for treatment is a way of viewing individual differences in seeking, engaging, or remaining in treatment. These individual differences likely involve emotional, cognitive, or decisional processes, but these processes have only recently been examined in relation to outcomes in the treatment of addiction (De Leon, 1998). Cognitive and psychological processes including motivation and self-efficacy may influence a person's decision to remain in a particular treatment or reduce substance intake. These cognitive processes are included in the repertoire of assets and liabilities that patients bring to the treatment experience and will interact with the treatment provider and the services offered. Therefore, understanding more about what the patient brings to the treatment experience in terms of motivation and self-efficacy may enhance understanding about dropout.

A number of studies have examined the role of motivation in treatment retention and substance use outcomes. Motivation at intake has been predictive of engagement and treatment retention in outpatient alcoholism treatment (Ryan, Plant, O'Malley, 1995). Earlier studies made attempts to abstract motivation from indirect and ill-defined measures, but more recent work on motivation has evolved into specific measurement of motivation and the influence it may have on other key therapeutic factors such as therapeutic alliance, self-efficacy, and coping skills (Stark, 1992).

In a series of studies conducted by the DATOS project, patient motivation at intake was associated with the formation of better therapeutic alliance, increased session

attendance and a more positive view of counsellor competence and peer support (Simpson, Joe, Rowan-Szal, & Broome et al., 1997). Treatment readiness, a measure of motivation at intake, was predictive of 90-day retention for long-term residential programs and outpatient methadone treatment programs, but not for the outpatient drug-free programs (Joe, Simpson, & Broome, 1998; Broome, Simpson & Joe, 1999; Joe, Simpson, & Broome, 1999). This illustrates the fact that in order to understand the effect of motivation on outcomes, information regarding the treatment provided is also necessary. Importantly, motivation, readiness to change, and the conceptually-linked variable of self-efficacy were the most consistent predictive pre-treatment variables for substance use outcomes at the 1-year and 3-year follow-up points in Project MATCH, a large multisite U.S. clinical trial designed to test patient-treatment matching hypotheses for patients with alcohol dependence (Project MATCH, 2003).

However, the association between motivation at intake and retention has not been upheld in other studies for outpatient substance abuse treatment (Fiorentine, Nakashima, & Anglin, 1999; Blanchard, Morgenstern, Morgan, Labouvie, & Bux, 2003; Patkar et al., 2004). Some of the contradictory findings about the association between pretreatment motivation and retention may be due to the use of different instruments of measurement and varying treatment durations and modalities examined. Motivation and treatment readiness are dynamic processes that change over time (Prochaska & DiClemente, 1992). It has been found that the intention to carry out a behaviour is likely to be a better predictor if the time interval between measurement of the intention and the behaviour is shorter (Ajzen, 1985; Ajzen, 1991, DeWeert-Van Oene, Schippers, Jong, & Schrijvers,

2000). Therefore, pretreatment motivation is most likely to be associated with early engagement in treatment, but may not be related to longer treatment retention or substance use outcomes at follow-up.

The concept of self-efficacy arising from a cognitive-social learning perspective refers to the belief that one can carry out the behaviours necessary to achieve a desired outcome (Bandura, 1977, Bandura, 1986). According to social learning theory, perceived self-efficacy is linked with initiation and maintenance of behaviour change. Although positive change in substance use self-efficacy has been found to be associated with reduced drug and alcohol use after outpatient treatment (McKay, Maisto, & O'Farrell, 1993; Maisto, Connors, & Zwyiak, 2000; Long, Williams, Midgeley, & Hollin, 2000; Brown, Seraganian, Tremblay, & Annis, 2002a), little research has examined the role of pre-treatment self-efficacy in prediction of outpatient treatment retention (L'Abbe, 1999).

The following section presents the rationale, objectives, and hypotheses for the present study based on the pertinent features of the literature review on predictors of retention in treatment and reduction of substance use.

Rationale for the Present Study

There are few consistently reproduced findings concerning the relationship between patient characteristics and retention in outpatient substance abuse treatment or substance use outcomes. Some studies have found that patients who are more socially stabile (older age, being married, employed) are likely to remain in treatment longer and show better outcomes. Severity of substance abuse has been identified as a factor associated with poorer retention and outcomes in some studies, although not consistently.

The findings on psychological and psychiatric problem severity are also mixed, since some patients may remain in treatment if they also receive help for depression, anxiety, or other psychiatric disorders. If psychiatric disorders are untreated, people may leave treatment early or show deterioration at follow-up (Moos, Moos, & Finney, 2001). Personality factors have only recently been explored, and there is some indication that the diagnosis of a personality disorder may be associated with poorer treatment retention and outcomes. Pretreatment motivation has shown some association with retention, but not consistently across studies. Although a number of studies have found an association with positive changes in self-efficacy and improved substance use outcomes at follow-up, little research has been conducted on the association between pretreatment self-efficacy and dropout. It is important to note that patient characteristics including sociodemographic, substance use, and psychological problems, generally account for only a very small proportion of the variance in outcomes, leaving a great deal of room for exploration of other relevant factors.

Despite the fact that some reviewers state that the most consistently replicated finding in drug abuse treatment outcome studies is that patients with more severe impairments, such as dual substance dependence and psychological impairments have lower retention rates and poorer post-treatment outcomes (Etheridge & Hubbard, 2000), no firm conclusions can be drawn because the nature of services provided and continuity of care available is also associated with outcomes (Ritsher, Moos, & Finney, 2002). In addition, studies have used different independent and outcome variables, samples, and durations of follow-up, thereby reducing generalizability of results (McKay & Weiss,

2001). The result of these methodological differences is that the research on factors predicting substance use outcomes is somewhat inconclusive, with no clear consensus on which variables are the best predictors (Kedia & Williams, 2003).

Despite the lack of consistency in predictors of treatment retention and substance use outcomes, most studies confirm findings about low rates of treatment completion as well as a positive association between longer treatment attendance and improved substance use outcomes. However, in nonrandomized studies, although patient characteristics may be associated with outcomes of dropout and substance use, differing treatment characteristics across programs including philosophy, goals, and actual services offered require cautious interpretation of findings. The answer to the question of "Is treatment effective?" must be based on an understanding of the interface between the characteristics of the patients using the services as well as the services provided.

Evaluation of Treatment from a Health Services Perspective

Demonstration of the success of treatment and measures taken to improve treatment will promote a dialogue for discussion of future funding and treatment planning. Another important reason for conducting research from a health services perspective is that evidence required for clinical decision-making about the design and operation of treatment services will likely be more relevant, appealing, and utilized by clinicians when it has been gained from research conducted in the field. The purpose of this thesis was to gather empirical data about retention in treatment and substance use outcomes for adults who sought treatment in an outpatient clinic in order to guide practical decisions about treatment services. An exploration of the most frequently

examined predictors of dropout and substance use outcomes was conducted in order to determine if client characteristics could be identified so that practical strategies and possible changes in treatment delivery could be implemented.

Objectives and Hypotheses

The main study was designed to determine factors associated with early dropout, survival in treatment, and examine substance use outcomes for patients with alcohol and drug dependence who sought treatment in a hospital-based outpatient community treatment setting. Five objectives were examined within the context of a naturalistic prospective follow-up study.

The first objective of the research was to determine whether patients who left treatment before 6 weeks (Early Dropouts) differed from those who stayed in treatment longer than 6 weeks (Retained) on sociodemographic, substance use, and psychological variables at baseline. Hypotheses based on this objective were:

⇒ Hypothesis 1-Younger age, and greater severity of social and substance abuse problems at intake would be associated with early dropout from treatment.

Based on the literature review and background studies conducted in the Addictions Unit, it was expected that the strength of the associations between sociodemographic characteristics and substance use problem severity at intake with dropout would be modest, still leaving unanswered questions about predictors of dropout.

Thus, the second objective of the study was to examine the relationships between dropout, and other factors including motivation, self-efficacy, and personality traits measured at intake. The primary variables were based on scores from the Stages of

Change, Readiness, and Treatment Eagerness Scale (SOCRATES), the Drug Taking Confidence Questionnaire (DTCQ), and the Dimensional Assessment of Personality Pathology (DAPP). These variables were assessed in a subset of the main study sample. Hypotheses based on this objective were:

⇒ Hypothesis 2- Lower motivation and self-efficacy scores at intake would be associated with early dropout from treatment.

⇒ Hypothesis 3- Higher scores on personality factors of antisocial behaviour and emotional dysregulation would be associated with early dropout from treatment.

The third objective was to examine the predictors of survival in treatment over the entire 6-month follow-up period. The hypothesis based on this objective was:

⇒ Hypothesis 4- Severity of substance dependence at intake would be associated with survival in treatment over time.

The fourth objective was to examine the association between retention in treatment and substance use outcomes and psychological and social functioning at 6 months. The primary variables related to substance use outcomes were: drug and alcohol composite severity scores on the Addiction Severity Index (ASI), the number of days of primary drug use in the past month, the number of days of any drug use in the past month, and days of continuous abstinence from the primary drug. The secondary variables related to psychological and social outcomes included the number of days of psychological problems in the past month, the Global Severity Index (GSI) scores, and the ASI employment composite severity scores. The hypotheses based on this objective were:

⇒ Hypothesis 5- The Retained group would show significantly less problems in all measures of substance use outcome at 6 months compared to the Early Dropouts.

⇒ Hypothesis 6- The Retained group would show significantly less psychological distress and employment problems at 6 months compared to the Early Dropouts.

The fifth objective was to determine the relative association among demographic, substance use, psychological variables, as well as treatment attendance and substance use outcomes at 6 months. The primary outcome variable was the number of days of primary drug use in the past 30 days at 6 months. The hypotheses based on this objective were:

⇒ Hypothesis 7- More severe substance abuse at intake would be associated with poorer drug and alcohol outcomes at 6-month follow-up.

⇒ Hypothesis 8- Longer treatment retention would be associated with less drug and alcohol use at 6 months.

The following chapter describes the methodology of the study conducted in order to evaluate the above hypotheses.

Chapter 2

Methodology and Procedures

The Research Site

The research was conducted at the Addictions Unit of the McGill University Health Center (MUHC), Department of Psychiatry, in Montreal, Quebec, Canada. The Addictions Unit is the only designated hospital-based substance abuse treatment program for adult English-speaking residents of Quebec and all treatment is covered by the Quebec health insurance plan. The treatment program is primarily outpatient, with a four-bed capacity for inpatient detoxification on a psychiatry unit in the hospital. An average of 450 patients receive treatment annually. The waiting time for entry to treatment after the initial telephone contact varies from 8 to 12 weeks. Patients may be self-referred, or may be referred by a health care provider, but must initiate the request for treatment on their own. A multidisciplinary mental health care team comprised of psychiatrists, psychologists, psychoeducators, nurses, and occupational therapists staff the Unit.

Patients and Procedures

Approval for the study was granted by the MUHC ethics committee (see Appendix A). All patients who contacted the Addictions Unit for treatment were eligible to participate in the study. A total of 411 patients were enrolled in the study following the procedures outlined below. The 6-month follow-up rate was 79% (N = 326): 293 attended interviews in person; 33 provided information only by telephone and did not return follow-up questionnaires; 39 refused to participate at 6 months; and 46 were unreachable. The procedure for enrollment into the study consisted of the following steps: 1) standard

Addictions Unit baseline assessment 2) obtaining informed consent; 3) psychiatric interview and application of study inclusion/exclusion criteria; 4) collecting additional measures including self-report instruments; 5) delivery of treatment; 6) follow-up interview and questionnaires at 6 months.

Detailed Procedures

1) Conducting the baseline assessment: Prior to assessment all patients received an information letter that described the clinic's abstinence-oriented treatment program and the research program. The initial interview consisted of the standardized assessment of approximately 2 hours duration. Data collected included sociodemographic information, treatment history, and severity of substance-related problems in a variety of areas covered by Addiction Severity Index (ASI) (McLellan, Parihk, & Braff, 1990). Depression was assessed using the Beck Depression Inventory (BDI) (Beck & Steer, 1987), and psychological distress was assessed using the Symptom Checklist-90 (SCL-90) (Derogatis, 1983). These core questionnaires were administered to all patients attending the Addictions Unit, as part of the standard initial clinic assessment. Details on the instruments are provided below.

2) Obtaining informed consent: After the standard clinical assessment, the follow-up study was explained to patients in detail by a research assistant who was independent from the treatment team, and consent to participate was requested. Patients were asked to sign consent allowing use of the information provided in the first clinical assessment, and completion of self-report measures on how they were feeling and thinking about attending treatment. They were also asked to consent to return for a confidential follow-

up interview, repeat self-report measures, and to provide a urine sample to be tested for alcohol and drugs at 6 months, even if they were no longer in treatment. The refusal rate for participation in the follow-up study was 11%.

3) Psychiatric assessment and application of study inclusion/exclusion criteria: All baseline assessments were reviewed by an Addictions Unit psychiatrist, who conducted a brief clinical interview with each patient in order to apply inclusion/exclusion criteria. Exclusion criteria were based on the Addiction Society of Addiction Medicine (ASAM) guidelines for inpatient treatment (Hoffman, Halikas, Mee-Lee, & Weedman, 1991), and were designed to exclude patients who were experiencing severe withdrawal syndromes, medical complications, or severe psychiatric comorbidity such as psychotic symptoms or suicidal ideation requiring admission to the hospital. Patients who had been abstinent for more than one month, undergone previous substance treatment within the past 3 months, or those mandated to treatment by court order were excluded from the follow-up study. The sample aimed to be representative of the total outpatient population seeking treatment, and only 3.5% (17) patients were ineligible based on these exclusion criteria.

4) Collecting Additional Measures and Self-Reports: A sample of patients consenting to participate in the follow-up study were administered an additional battery of instruments including: the Stages of Change, Readiness, and Treatment Eagerness Scale (SOCRATES), the Drug Taking Confidence Questionnaire (DTCQ), and the Dimensional Assessment of Personality Pathology (DAPP). These questionnaires were given to a consecutive sample of patients later in the study in the form of a take-home

package so that they would not be burdened by the additional time required to complete the measures at assessment.

5) Delivery of treatment: Following assessment, all patients entered the standard Addictions Unit treatment program. The duration of recommended treatment in the Addictions Unit was from 6 to 12 months, based on patient progress and discussion with their primary care therapist. The treatment philosophy of the clinic was based on a goal of total abstinence from alcohol and psychoactive drugs (with the exclusion of non-addictive prescribed medication for co-existing Axis I disorders). Treatment was divided into the initial phase of engagement (Phase I) and the second phase of maintenance (Phase II).

The engagement phase (Phase I) was of 6 weeks duration. During Phase I each patient was treated by a single therapist and attended one group therapy session and one individual therapy session per week. The goal of Phase I was to achieve abstinence from alcohol and all drugs. Interventions during this phase were primarily based on motivational enhancement strategies, psychoeducation, cognitive-behavioural techniques, and coping skills training. The 50-minute individual therapy sessions covered a series of themes including: motivation for seeking treatment, coping with urges and cravings, identifying and preparing for high risk situations, and strategies to prevent relapse. A support group was available for the patient's significant others. The 90-minute group therapy sessions were comprised of similar themes and interventions, but included more psychoeducation about substance dependence, and an introduction to working in groups.

This engagement phase of treatment was followed by the maintenance phase (Phase II) that lasted 6 to 12 months.

Phase II of treatment consisted primarily of group therapy once or twice weekly. Groups were comprised of 6 to 8 members and led by a therapist with training in addiction and psychiatry. The therapeutic orientation of the groups in Phase II was a combination of supportive, cognitive-behavioural, and insight-oriented interventions. The groups were aimed at helping patients to adjust to a drug-free lifestyle, examine the function and consequences of substance abuse in their lives, develop new coping skills, identify high risk situations to prevent relapse, develop or maintain an appropriate social support system, and identify factors that could interfere with ongoing sobriety. Discharge planning was discussed between the patient and primary therapist.

Due to the heterogeneous nature of the population, three groups for patients with special needs were also available. These were the senior's group for patients 55 and older, a women's group, and a dual diagnosis group. Further psychiatric evaluation or short-term treatment was provided on an as-needed basis during the course of treatment. In the event that long-term psychiatric follow-up was needed, it was provided by the patient's psychiatry sector services in the community.

Therapists and Psychiatrists

The therapists who delivered the Phase I individual and group sessions remained consistent throughout this study. They were two Master's level trained therapists with from 8 to 15 years of experience working in addiction treatment. The therapists discussed cases and therapeutic procedures on a regular basis to ensure consistency of approach and

treatment delivery in individual and group sessions in Phase I of the treatment.

Therapists delivering Phase II group therapy were all experienced mental health practitioners with backgrounds in nursing, social work, and occupational therapy, with an average of 15 years experience working in addiction treatment or mental health. Psychiatrists on staff met with all therapists weekly at team rounds to discuss case management, follow-up, or referral for psychiatric evaluation.

6) Follow-up procedures at 6 months: At the time of assessment consenting patients were asked to provide the names of three contact persons who would know where to reach them at follow-up but would not be given any information about the nature of the contact. A trained research interviewer who was not part of the treatment program conducted the follow-up interviews. Patients were compensated with $ 20 gift certificates for attending the interview, or completion of questionnaires in the case of a phone contact. Follow-up efforts were begun 2 weeks before the 6-month date and were extended up to 2 months in the event that patients were unreachable at the time. In these cases, retrospective interviews were conducted, using the timeline followback method (Sobell & Sobell, 1996b). When patients had cancelled or did not show for two scheduled in-person interviews, attempts were made to conduct phone interviews.

Measures

Substance Use: Demographic characteristics including age, gender, marital status, living situation, education, employment status, were collected using the Addiction Severity Index (ASI) (McLellan, Parikh, & Braff, 1990). The ASI is a 45 to 60 minute structured interview that measures lifetime and recent (past 30 days) problem severity in

seven categories: drug and alcohol use, family/social functioning, and medical, employment, legal, and psychological status. Within each of these categories, items measuring the severity of the problem in the last 30 days and are combined into a composite score. The composite scores are computed on a range from 0 (no significant problem) to 1 (extreme problem) to reflect problem severity for each category. The ASI composite scores have shown acceptable internal consistency (Cronbach's alpha ranging form .68 to .87) and test-retest reliability (kappas ranging .88 to .99) in opiate, alcohol and cocaine-dependent populations (McLellan et al., 1994). The ASI has been found to have high inter-rater reliability for all composite scores (Alterman, Brown, Zaballero, & McKay, 1994), and clinical dimensions have been shown to retain concurrent and predictive validity across a wide range of substance dependent patients (Alterman et al., 2000).

Psychological Distress: The Beck Depression Inventory: The BDI (Beck & Steer, 1987) is a 21-item self-report questionnaire designed to assess the severity of depression. For each item there is a series of four statements on a 4-point scale to reflect the range of severity of symptoms for affective, cognitive, behavioural, somatic, and interpersonal aspects of depression experienced over the past seven days. The inventory takes from 5 to 10 minutes to complete. Total scores range form 0 to 63. A score of over 20 has been used to define moderate to severe depression (Kendall, Hollon, Beck, Hammen, & Ingram, 1987). Psychometric studies found high internal consistency in clinical and nonclinical populations, including outpatient and heroin samples with coefficient alphas of .90 and .88, respectively.

The Symptom Checklist-90-R (SCL-90): The SCL-90-R (Derogatis, 1983) is a 90-item self-report symptom inventory that measures psychological distress

experienced in the past seven days. The subscales include interpersonal sensitivity, somatization, obsessive-compulsiveness, depression, anxiety, phobic anxiety, hostility, paranoid ideation, and psychoticism. Each item ranges from 0 to 4. Three global indices of pathology are provided. The Global Severity Index (GSI) indicates the overall intensity of subjective distress, the Positive Symptom Total (PST) represents the total number of symptoms experienced, and the Positive Symptom Distress Index (PSDI) is a score that combines the intensity and the number of symptoms. Internal consistency for various subscales ranges from 0.77 – 0.90, and test-retest reliability ranges from 0.78 – 0.90 (Derogatis, 1983).

Additional Measures Administered to the Subset of the Total Sample

In addition to the core questionnaires, a subset of patients was given additional questionnaires at baseline to assess motivation, self-efficacy, and personality factors. The self-efficacy questionnaire was re-administered at 6-month follow-up.

Motivation: The Stages of Change, Readiness, and Treatment Eagerness Scale (SOCRATES) (Miller et al., 1991; Miller & Tonigan, 1996) is a self-report inventory designed to assess readiness for change in alcohol and drug abusers. It is a 40-item scale that produces scores on 5 scales corresponding to Prochaska and DiClemente's (1992) five Stages of Change theory. The instrument yields three factorally-derived scale scores: Recognition, Ambivalence, and Taking Steps. Cronbach's alpha for the scales are: Ambivalence: 0.60 - 0.88; Recognition: 0.85 - 0.95; and Taking Steps: 0.83 - 0.96.

Self-Efficacy: The Drug Taking Confidence Questionnaire (DTCQ), (Annis, Sklar, & Turner,1997; Sklar, Annis, & Turner, 1997) is a 50-item self-report

inventory that was developed for people seeking treatment for drug and alcohol problems. It is grounded in Bandura's (1977) theory of self-efficacy, but is specific to drinking and drug-use situations. The eight subscales are based on Marlatt & Gordon's (1985) category classifications of relapse precipitants. Each subscale is rated by increments of 20 from 0 to 100 on a 6-point scale. Respondents rate their confidence in ability to resist drinking or taking drugs in each of the situations. The scales are subdivided into two major types of situations: personal states, and situations involving other people. The subscales included in "personal states" are: unpleasant emotions (10 items), physical discomfort (5 items), pleasant emotions (5 items), testing personal control (5 items), and urges and temptations (5 items). The subscales included in the "situations involving others" are: conflict with others (10 items), social pressure to use (5 items), and pleasant times with others (5 items). Cronbach's alpha for the two 10-item scales on the DTCQ (unpleasant emotions and conflict with others) each had alphas of at least 0.94. All six of the 5-item scales had alphas ranging from 0.79 - 0.95.

Personality Factors: The Dimensional Assessment of Personality (DAPP) is an abbreviated 69-item form of the original 291-item inventory (Livesley, Jang, & Vernon, 1998; Jang, Vernon, & Livesley, 2000). It consists of 18 dimensions that are combined to derive four factorally-derived factors of personality. The research involved in the development of the personality inventory was based on evidence that personality traits are hierarchically organized with more specific lower-order traits combined to form more general higher-order traits. The DAPP was constructed from factor analysis based on three samples: a clinical sample of patients with a DSM-IV diagnosis of personality disorders, a general population sample, and a sample of twin

pairs. The four factors that emerged through principal component analysis were similar across the three samples. The emotional dysregulation factor represents unstable and reactive tendencies, dissatisfaction with self and life experiences, and broadly represents DSM-IV cluster B diagnosis of borderline personality disorder. The lower-order dimensions included in this factor are: submissiveness, cognitive dysregulation, identity problems, affective lability, oppositionality, anxiousness, suspiciousness, social avoidance, and insecure attachment. The dissocial behaviour factor includes personality dimensions of stimulus-seeking, callousness, rejection, narcissism, and conduct problems, and resembles the DSM-IV cluster B diagnosis of antisocial personality disorder. The inhibitedness factor is defined by intimacy problems and restricted expression, and resembles the DSM-IV diagnosis of avoidant and schizotypal personality disorders. The compulsivity factor is most similar to the obsessive-compulsive personality disorder of DSM-IV, marked by compulsivity. The DAPP has internal consistency (Chronbach's alpha) ranging from 0.83 – 0.94, and test-re-test reliability ranging from 0.81 – 0.93.

Measures Related to Treatment Attendance and Participation

Information collected during treatment was obtained from medical charts and included: the frequency and amount of substance use reported by patients, results of urine screening, clinical notes of the treating team consisting of individual therapy session reports as well as primary therapist monthly progress notes. Attendance records were used to verify all treatment contacts, including individual therapist and psychiatrist appointments, group sessions, and the total number of days in treatment.

Statistical Plan and Data Analyses

For each patient, data collected during the baseline and follow-up interviews and all variables recorded from Addictions Unit charts were coded and entered by the research assistant into a database using Microsoft Excel, and checked for accuracy by the principal investigator. All subsequent statistical analyses were conducted using the microcomputer version of SPSS (11.5). Two groups were created using a cutoff of 6 weeks as the time point for distinguishing Early Dropout (EDO) patients from those who were Retained (RTD) longer in treatment. This time point was chosen based on the design of the treatment program in the clinic. As outlined in the section describing the treatment, the therapy was divided into two phases, the first phase of engagement was 6 weeks and the second phase of maintenance was 6 to 12 months. Therefore, a natural time frame for examining early dropout in the clinic was to look at retention based on completion of the engagement phase of treatment.

The first objective of the research was to determine whether patients who left treatment before 6 weeks (Early Dropouts) differed from those who stayed in treatment longer than 6 weeks (Retained) on important sociodemographic, substance use, and psychological variables at baseline. Descriptive analyses were conducted on all baseline and follow-up data in order to compare the two groups on demographic, social, substance use, and psychological factors. Associations were examined using Chi-square analysis for categorical data and Student's t-tests for continuous data, with a Bonferroni correction for multiple comparisons. Subsequently, variables relating to age, gender, employment, primary drug of abuse, severity of substance abuse, psychiatric diagnoses, and psychological distress were used as predictors of early

dropout in a multiple logistic regression analysis to examine predictors of early dropout. This analysis was chosen because while the dependent variable is dichotomous, it accepts a mixture of nominal, ordinal, and interval independent variables and is useful for exploratory and predictive research (Hosmer & Lemeshow, 1989).

The second objective was to determine if motivation, self-efficacy, and personality factors assessed at intake were related to early dropout from treatment. The primary variables were based on scores from the Stages of Change, Readiness, and Treatment Eagerness Scale (SOCRATES), the Drug Taking Confidence Questionnaire (DTCQ), and the Dimensional Assessment of Personality Pathology (DAPP). Separate analyses were carried out on the subset of patients who completed the SOCRATES, DTCQ, and the DAPP. These analyses included Student's t-tests and Chi-square analyses in order to examine associations between motivation, self-efficacy, and personality factors and retention in treatment.

The third objective was to determine if predictors of attrition from treatment over time differed from those of early dropout. The primary variable for this objective was survival in treatment up to 6 months. Separate survival analyses were conducted in order to compare males and females, as well as the different primary drug groups (alcohol, drugs, alcohol + drugs). In addition, comparisons were made between those patients with and without depression at intake, as determined by Beck Depression Inventory scores > 20. The survival functions for the different groups were compared using the Wilcoxon (Gehan) statistic provided by SPSS, yielding comparisons of the median survival time in treatment. Subsequently a Cox proportional hazards regression analysis was used to determine the relative association among

demographic, substance use, psychological variables, and rate of attrition from treatment over 6 months.

The fourth objective was to examine the association between retention in treatment and substance use outcomes and psychological and employment problems at 6 months. Primary outcome variables were analyzed using a two-way ANOVA with repeated measures, with retention status (Early Dropouts versus Retained) X time (intake, 6 months) as factors. The primary outcome variables for measurement of the substance use outcomes were: the drug and alcohol composite severity scores on the Addiction Severity Index (ASI), the number of days of primary drug use in the past month, and the number of days of any drug use in the past month.

Secondary outcome variables were also analyzed using a two-way ANOVA with repeated measures, with retention status (Early Dropouts versus Retained) x time (intake, 6 months) as factors. The secondary outcome variables for measurement of the objective for psychological functioning and employment problems were: the number of days of psychological problems in the past month, the Global Severity Index (GSI) scores, and the ASI employment composite severity scores.

The fifth objective was to determine the relative association among demographic, substance use, psychological variables, as well as treatment attendance and substance use outcomes at 6 months. The primary outcome variable was the number of days of primary drug use in the past 30 days, as measured at the 6-month follow-up interview. Variables relating to age, gender, employment, primary drug of abuse, severity of substance abuse, psychological distress at intake, and treatment attendance were used as predictors in a hierarchical linear regression analysis. The stepwise model of entry for this analysis sequentially tests independent variables for

their contribution to explaining variation in the independent variable and the predictor that accounts for the largest portion of the variance is entered into the equation at that point. The variance accounted for by that variable is removed from the equation, providing and opportunity to test remaining variables for their independent contribution to explaining the remaining variance. The results therefore provide a test of individual contribution of subsequent variables, adjusting for the contribution of all previous variables. These subsequent predictors are then tested and entered in order of their contribution to the explanation of the variance in the particular outcome criterion (McLellan, 1994).

Chapter 3

Predictors of Treatment Retention

A total of 411 patients participated in the follow-up study. The sample was initially stratified into two groups based on treatment attendance. The Early Dropout (EDO) group left treatment before 6 weeks, and the Retained (RTD) group stayed in treatment beyond this time period. Twenty-six per cent of patients (109) left treatment before 6 weeks.

Tables 1 through 5 display the demographic, social, substance use, and psychological characteristics of the sample at intake, stratified by Early Dropout classification. Table 1 shows that the total sample was two thirds male. Almost all patients (93%) were Caucasian. Patients in the EDO group were significantly younger than those in the RTD group [$t\ (409) = -3.88$, $p = 0.001$]. The ASI employment composite severity scores demonstrate that the EDO group had more employment problems [$t\ (406) = 2.57$, $p = 0.011$], but it is evident that all patients were generally experiencing a moderately high degree of problems related to work. Less than 50% in both groups were employed full or part-time. Table 2 shows that the sample was largely single, and most patients were living with a family member. There were no significant differences between groups on any of the social variables examined.

Table 1: Demographic Characteristics of the Sample at Intake

	Early Dropouts N = 109	Retained > 6 weeks N = 302
Age*	37.5 (0.86)	41.4 (0.67)
Gender		
Male	64.2%	60.3%
Employment status		
Unemployed	43.5%	36.9%
Employed (full or part-time)	41.7%	49.8%
Student/Retired/Homemaker	14.8%	13.3%
Number of years of education	13.0 (0.3)	13.5 (0.18)

Groups were compared using Student's t-tests, and Chi-square analysis.
Values are percentages or means (± SEM).
* $p < 0.05$ corrected for multiple comparisons.
ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

Table 2: Social Variables at Intake

	Early Dropouts N = 109	Retained > 6 weeks N = 302
Marital Status		
Single	47.7%	41.4%
Married/Common Law	24.8%	36.8%
Widowed/Separated/Divorced	26.8%	22.1%
ASI Social Composite Severity score	0.26 (0.02)	0.22 (0.01)
Living arrangements		
Family	62.4%	59.9%
Friends	5.5%	3.3%
Alone/Other	32.1%	36.8%
Number of days of family problems (past month)	2.6 (0.63)	3.0 (0.4)
Number of days of problems with people (past month)	1.7 (0.46)	1.3 (0.27)
ASI Legal Composite Severity score	0.07 (0.01)	0.04 (0.01)

Groups were compared using Student's t-tests, and Chi-square analysis.
Values are percentages or means (± SEM).
* $p < 0.05$ corrected for multiple comparisons.
ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

Substance Use Variables

Patients reported their primary and secondary drugs of abuse as part of the ASI intake interview. For the total sample (N = 411) the overall distribution of primary drug of abuse was as follows: alcohol, 55%; cocaine, 24%; cannabis, 10%; benzodiazepines, 6%; opiates, 4%. Forty-six per cent had a secondary drug of abuse and 52% were using a second substance. Patients were further classified into three mutually exclusive groups

based on primary and secondary drugs of abuse. Patients in the alcohol alone group were dependent only on alcohol. The drug group was comprised of patients dependent on cocaine, cannabis, opiates, or benzodiazepines, with some abusing more than one drug. The alcohol plus drug group was comprised of those dependent on alcohol as well as another drug.

As shown in Table 3, the ASI alcohol and drug composite severity scores supported the accuracy of primary group assignment. The alcohol composite severity scores were elevated in the alcohol only and alcohol + drug groups compared to the drug only group [$F(2, 404) = 141.53$, $p < 0.0001$]. The drug composite severity scores were elevated in the drug only and the alcohol + drug groups compared to the alcohol only group [$F(2,403) = 206.64$, $p < 0.0001$]. Table 4 shows that there were no significant differences at intake between the EDO and RTD groups for either alcohol or drug severity measured by the ASI alcohol and drug composite severity scores.

Table 3: Mean ASI Alcohol and Drug Composite Severity Scores for Primary Drug Group for Total Sample at Intake (N = 411)

	ASI Alcohol Composite Severity Score	ASI Drug Composite Severity Score
Alcohol alone (N = 134)	0.54 (0.02)	0.03 (0.005)
Drugs (N =111)	0.08 (0.01)	0.24 (0.01)
Alcohol + Drugs (N = 166)	0.47 (0.02)	0.19 (0.01)

Groups were compared using ANOVA.
Values are means (± SEM).

Table 4: Substance Use Variables Stratified by Early Dropout

	Early Dropouts N = 109	Retained > 6 weeks N = 302
Number of years of problem use of primary drug	9.3 (0.77)	11.1 (0.51)
Primary drug of abuse		
Alcohol alone	27.5%	34.4%
Drugs	30.3%	25.8%
Alcohol + Drugs	42.2%	39.7%
Number of days of primary drug intake (past month)	14.9 (1.12)	15.0 (0.69)
Previous treatment for substance abuse	48.1%	50.7%
ASI Alcohol Composite Severity score	0.36 (0.03)	0.40 (0.02)
ASI Drug Composite Severity score	0.15 (0.01)	0.15 (0.01)
ASI Medical Composite Severity score	0.16 (0.03)	0.21 (0.02)
Secondary drug of abuse	53.2%	42.7%

Groups were compared using Student's t-tests, and Chi-square analysis.
Values are percentages or means (± SEM).
* $p < 0.05$ corrected for multiple comparisons.
ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

Psychological Variables

The psychological variables shown in Table 5 demonstrate that there were few significant differences between groups at intake. Two thirds of patients in both groups had a lifetime history of anxiety, depression, or both. The Beck Depression Inventory (BDI) total score was elevated for patients who dropped out early [$t(382) = 1.98$, $p = 0.048$], but the value was not significant when corrected for multiple comparisons. Patients who dropped out before 6 weeks were less likely to be taking psychiatric medication at intake [$\chi^2(1) = 7.43$, $p = 0.006$].

Treatment Attendance

Table 6 summarizes the rates of treatment attendance for both groups. The EDO group stayed in treatment for an average of 23 days and attended an average of 6 therapy sessions in total: 2 individual sessions, 4 group sessions, and less than one session with a psychiatrist. The RTD group stayed an average of 147 days and attended an average of 27 therapy sessions in total: 5 individual sessions, 18 group sessions, and 3 sessions with a psychiatrist. As expected, attendance to total, individual, group, and psychiatry sessions confirmed that the EDO group attended significantly fewer sessions in each category compared to the RTD group.

Table 5: Psychological Variables at Intake

	Early Dropouts N = 109	Retained > 6 weeks N = 302
GSI (SCL-90)	1.25 (0.07)	1.17 (0.04)
History of anxiety or depression (lifetime)	31.8%	33.6%
None	24.3%	26.2%
Depression only	12.1%	13.0%
Anxiety only	31.8%	27.2%
Depression + anxiety		
Beck Depression Inventory total score	20.14 (1.07)	17.84 (0.59)
ASI Psychological Composite Severity score	0.37 (0.02)	0.36 (0.01)
Previous treatment received for psychological problems (lifetime)		
Inpatient	22%	19%
Outpatient	71.3%	73.6%
Taking medication for psychiatric disorder*	35.5%	50.8%

Groups were compared using Student's t-tests, and Chi-square analysis.
Values are percentages or means (± SEM).
* $p < 0.05$ corrected for multiple comparisons.
ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.
GSI-Global Severity Index on the Symptom Checklist-90.

Table 6: Comparison of Treatment Attendance Between Early Dropout and Retained Groups

	Early Dropouts N = 109	Retained > 6 weeks N = 302
Length of time in treatment*	22.94 (1.30)	146.87 (3.36)
Total number of therapy sessions*	6.42 (0.72)	26.69 (2.68)
Number of group sessions*	3.93 (0.6)	18.55 (0.84)
Number of individual sessions*	2.01 (0.15)	5.48 (0.23)
Number of psychiatry sessions*	0.53 (0.11)	2.76 (0.22)

Groups were compared using Student's t-tests.
Values are percentages or means (± SEM).
*$p < 0.05$ corrected for multiple comparisons.

Based on preliminary comparisons of sociodemographic characteristics, it was found that patients who dropped out early were significantly younger and experiencing more employment problems compared to those retained longer than 6 weeks. Social and living situations did not differ between groups. There were no significant differences evident for severity of substance use or primary drug group between EDO and RTD groups. Patients who left treatment before 6 weeks were less likely to be taking psychiatric medication, but did not differ significantly from those retained on any other psychological variables.

Predictors of Early Dropout

Based on the above comparisons, there were few baseline differences identified between the EDO and RTD groups, however, there may have been confounding variables, for example, age and severity of substance use. In order to control for confounding variables, and to explore the relative contribution of predictors of early dropout, a stepwise logistic regression using SPSS (2002) was carried out. The question addressed by the analysis was "How do Early Dropouts differ from those retained longer in treatment?" The analysis sought to determine the extent to which demographic characteristics, substance use severity, and psychological problems coincided with early dropout. Each set of variables was entered stepwise into the regression model, with the dependent variable set as Retained > 6 weeks (0 = no, 1 = yes). Since t-tests had shown that ASI employment composite severity scores were elevated in the EDO group, this variable was entered in the first step of the model along with other sociodemographic variables of age, gender, and marital status. The primary drug group and the ASI alcohol and drug composite severity scores were entered in the second step. In the third step of the

model the Global Severity Index (GSI) from the SCL-90 and the ASI psychological composite severity score were entered.

Table 7 shows that only the sociodemographic variables of age, marital status, and the ASI employment composite severity score were associated with early dropout. None of the substance use or psychological variables in the model were significantly associated with early dropout. Results indicated, as hypothesized, that less social stability, i.e., younger age, divorced, separated or widowed marital status, and more severe employment problems, were associated with early dropout. More psychological problem severity at intake, specifically, higher scores on the ASI psychological composite severity score, and the GSI score, was not associated with early dropout. Similarly, those with more severe substance use problems at intake were not more likely to drop out of treatment early.

Motivation, Self-Efficacy, and Personality Factors and Treatment Retention

Psychological problem severity measured by the ASI composite scores and the GSI scores were not predictive of early or later dropout. When patients were assessed, they were asked why they were seeking treatment at that time. "Family" was the most frequent response given by 24% of participants as the reason for seeking treatment, followed by health for 18%, then work, for 6%, and financial or legal concerns, 5%. The other reasons given included more general kinds of motivators for treatment (46%) such as being tired of the lifestyle, feeling "stuck" in a cycle, losing time due to substance abuse, or no longer getting the same pleasure from alcohol and drugs. There were no significant differences in reasons for seeking treatment between the EDO and RTD groups [χ^2 (5) = 5.035, p = 0.412]. Since level of motivation, self-

Table 7: Summary of Results of Logistic Regression for Early Dropout (N = 391)

Variable	B	Wald (df)	p value
Step 1 Nagelkerke R2 = 0.081 Step: χ^2 = 22.15 (5) p = 0.0001			
Age	0.044	10.00(1)	0.002
Gender†	0.368	1.98 (1)	0.159
Marital status††		5.413	0.067
Single		4.47 (2)	0.575
Married/ Commonlaw	-0.148	0.209 (1)	0.648
Divorced/Separated/ Widowed	-0.721	4.98 (1)	0.026
ASI Employment Composite Severity score	-1.050	6.24	0.012
Step 2 Nagelkerke R2 = 0.085 Step: χ^2 (2) = 23.17, p = 0.006 $\Delta\chi^2$ (4) = 1.017 p = 0.924			
Primary drug group†††			
Alcohol alone		0.204 (2)	0.903
Drugs	0.061	0.01 (1)	0.909
Alcohol + Drugs	-0.088	0.053 (1)	0.916
ASI Drug Composite Severity score	0.936	0.379(1)	0.538
ASI Alcohol Composite Severity score	0.104	0.035 (1)	0.851
Step 3 Nagelkerke R2 = 0.085 Step: χ^2 (3) = 23. 21, p = 0.017 $\Delta\chi^2$ (2) = 0.041, p = 0.980			
ASI Psychological Composite Severity score	0.130	0.039 (1)	0.843
GSI score (SCL-90)	0.118	0.006(1)	0.937

† Males served as reference group
†† Single served as reference group
††† Alcohol served as reference group

ASI-Addiction Severity Index
GSI-Global Severity Index on the Symptom Checklist-90

efficacy regarding resistance to substance use, and personality features have been associated with poorer treatment outcomes of retention and change in substance abuse, additional information about these factors was gathered in a subset of the main sample.

In order to examine associations between motivation, self-efficacy, personality features, and treatment retention, a subset of the main sample of 411 participants was given additional questionnaires at assessment. The Stages of Change, Readiness, and Treatment Eagerness Scale (SOCRATES) was administered to assess motivation. The Drug Taking Confidence Questionnaire (DTCQ) was administered to assess self-efficacy in specific substance-using situations. The Dimensional Assessment of Personality Pathology (DAPP) (Livesley et al., 1998) was administered to assess personality factors. The DTCQ and SOCRATES were given to 199 participants. The DAPP was added later and was given to 165 patients. Not all patients who were given questionnaires returned them, and data obtained for the questionnaires at intake were as follows: SOCRATES, 168; DTCQ, 166; and DAPP, 120.

These additional questionnaires were given to consecutively entered patients after subject # 211. Previous studies conducted in the Addictions Unit demonstrated that patients seeking treatment over the past 5 years have had very similar demographic, substance use, and psychiatric profiles. However, the subset was compared with the larger sample to determine if there were significant differences on important demographic or substance use characteristics. There were no significant differences on ASI employment, social, legal, medical, and drug severity composite scores. Although the means of the ASI alcohol composite severity scores for the

subset (M = 0.427, S.E.M. 0.022) and the earlier part of the sample (M = 0.346, S.E.M. 0.019) were significantly different [t (398) = 2.76, p = 0.006], there were no significant differences on the number of days of primary drug intake or the number of days of any substance use in the past 30 days. The ASI psychological composite severity scores for the subset (M = 0.333, S.E.M. 0.016) and the first half of the sample (M = 0.402, S.E.M. = 0.017), were significantly different [t (405) = -2.912, p = 0.004], but there were no significant differences on the SCL-90 or Beck Depression Inventory scores.

Motivation and Self-Efficacy

As shown in Table 8, the scores on the SOCRATES scales of Recognition, Taking Steps, and Ambivalence, and the average DTCQ subscale scores for the EDO and RTD groups were very similar, and analyses using t-tests comparing the means yielded no significant differences at baseline. Nor were there differences on the individual subscales of the DTCQ between groups. Therefore, the hypothesis that lower motivation and self-efficacy scores at intake would be associated with early dropout was not supported.

Personality Factors

For the subset of patients who were given additional questionnaires to assess motivation and self-efficacy, clinic files were reviewed and coded for a DSM-IV diagnosis of any personality disorder being "present" or "not present" based on initial psychiatric assessment. Based on this coding, 23.6% of this subset had an Axis II disorder (n = 47). There was no significant difference between the EDO (28.6%) and

Table 8: Comparison of scores on the SOCRATES and DTCQ for Early Dropout and Retained Groups at Intake

	Early Dropouts	Retained > 6 weeks
SOCRATES (N = 168)	N = 44	N = 124
Ambivalence	14.84 (0.58)	14.39 (0.37)
Recognition	29.64 (0.79)	29.54 (0.50)
Taking Steps	30.34 (1.13)	30.36 (0.71)
DTCQ (N = 166)	N = 40	N = 126
Average subscale score	55.94 (3.86)	56.57 (2.16)

Groups were compared using Student's t-tests.
Values are percentages or means (± SEM).
* $p < 0.05$ corrected for multiple comparisons.

RTD (22.4%) groups for presence of a personality disorder [χ^2 (1) = 0.884, p = 0.347]. The prevalence of Axis II disorders coded was: 9.5% borderline, 2.5% antisocial, 2.5% narcissistic, 1.5% histrionic, 1.5% dependent, 1% avoidant, and 5% "not otherwise specified".

All 7 ASI composite scores were examined using t-tests to determine if the diagnosis of a personality disorder was associated with greater problem severity in any of these areas at intake. As expected, higher ASI psychological composite severity scores were significantly associated with the presence of a personality disorder [t (193) = -2.914, p = 0.004]. The diagnosis of personality disorder was associated with higher ASI drug composite severity scores [t (192) = -2.048), p = 0.042], although this value was not significant when corrected for multiple comparisons. There were also significant differences in the prevalence of personality disorders for the primary drug groups. Twelve per cent of those in the alcohol alone group had a diagnosis of a personality disorder, compared to 25% in the alcohol and drug group, and 37% in the drug only group [χ^2 (2) = 9.338, p = 0.009].

Since the ASI psychological composite severity score was significantly elevated in those with a diagnosis of an Axis II disorder, and the co-existence of both Axis I and Axis II disorders is common, a Chi-square analysis was conducted to determine if there was a relationship between diagnosis of Axis I and Axis II disorders but no significant association was found [χ^2 (1) = 0.383, p = 0.536].

The diagnosis of a personality disorder per se may be less predictive of poorer outcomes than the particular traits associated with a specific personality disorder. The DAPP questionnaire was administered in order to examine an association between certain personality factors and early dropout from treatment. These 4 personality

factors were: emotional dysregulation, dissocial behaviour, inhibition, and compulsivity. It was predicted that those with higher scores on emotional dysregulation, and dissocial behaviour would be more likely to drop out of treatment early. T-tests confirmed a significant association between the inhibition factor and early dropout [t (117) = 2.015, p = 0.046], although this was not significant when corrected for multiple comparisons. The scores for factors of emotional dysregulation and dissocial behaviour were not significantly elevated in the early dropouts compared to those retained, as had been hypothesized.

Factors Associated with Survival in Treatment Over Time

Since the primary focus of the research was based on a health service perspective, questions of interest in this study included those related to the percentage of patients completing the recommended treatment and the patient characteristics associated with completion of the program. To examine additional characteristics associated with overall rates of attrition from treatment over time, several survival analyses were conducted. The survival functions for the different groups were compared using the Wilcoxon (Gehan) statistic provided by SPSS, yielding comparisons of the median survival time.

Analyses were conducted in order to determine if there were differential rates of attrition from treatment for males and females. The results of the survival analysis showed that the median survival time for males (117 days), and females (158 days) was not significantly different [Gehan statistic (1,411) = 1.34, p = 0.247].

A survival analysis was conducted to examine rates of attrition from treatment based on BDI scores. The outcome criterion used was "Depressed" or "Not Depressed", with a total BDI score of 20 or more as the cut-off for depression. The

results of the survival analysis comparing the Depressed and Not Depressed groups showed no significant difference for median survival time [Gehan statistic (1, 411), = 2.34, p = 0.126].

A third survival analysis was conducted to examine median lengths of stay in treatment for each of the primary drug groups. A comparison of the primary drug groups in terms of rates of survival in treatment over the 6-month follow-up period is represented in Figure 1. There was a significant difference among the three primary drug groups for median length of stay in treatment [Gehan statistic (2, 411) = 7.08, p = 0.03]. Pairwise comparisons indicated that the rate of attrition was significantly higher in the drug group compared to the alcohol alone group [Gehan statistic (1,245) = 7.51 p = 0.006], but not between the alcohol alone and alcohol + drugs groups [Gehan statistic (1,300), = 0.133], or the drug group and the alcohol + drug groups [Gehan statistic (1,277) = 0.231].

Based on the results of the logistic regression conducted on early dropout, and the survival analysis indicating significant differences in median lengths of stay among the primary drug groups, chi-square analyses and ANOVA's were conducted comparing age, marital status, and ASI employment composite severity scores among the primary drug groups. When corrected for multiple comparisons, only age remained significantly different among the three drug groups, with the alcohol alone group being significantly older than the drug and the drug + alcohol groups [F (2, 410) = 27.363, p < 0.0001] (Scheffe post hoc tests).

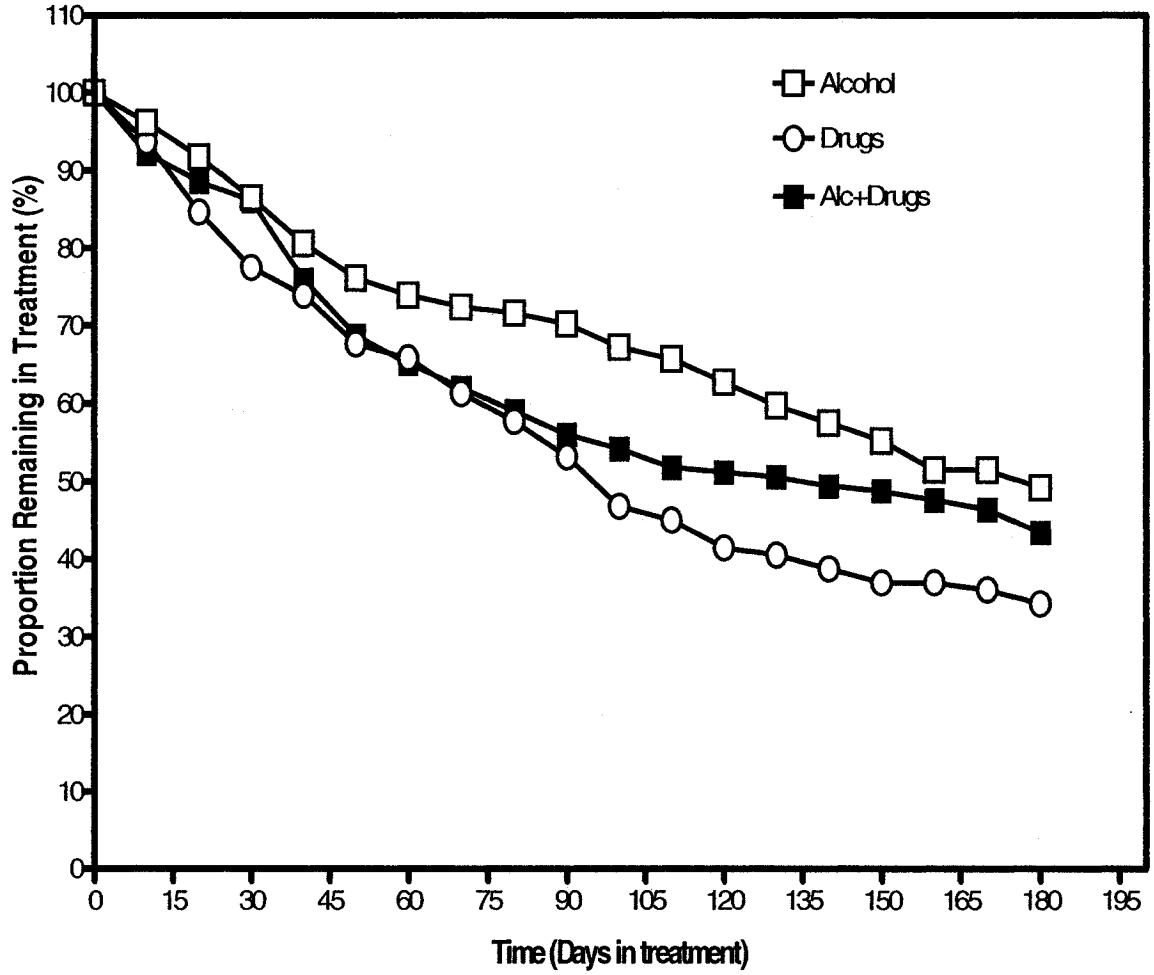

Figure 1. A comparison of the primary drug groups in terms of rates of survival in treatment over the 6-month follow-up period

Cox proportional hazards regression (SPSS) was utilized to determine factors associated with the rate of attrition from treatment over 6 months. Sociodemographic, substance use, and psychological variables at intake were examined for an association with the rate of attrition from treatment. The variables were selected using the same rationale as the model for logistic regression for early dropout, based on the literature showing an association with these variables and dropout. The logistic regression had examined predictors of early dropout and found a significant association with age, marital status, and severity of employment problems. The Cox regression model was conducted to examine patient factors at intake that were associated with survival in treatment over time, with the dependent variable set as the number of days in treatment.

As Table 9 demonstrates, in the final step of the Cox regression model, younger age, male gender, and higher severity of employment problems were significant determinants of attrition from treatment up to 6 months. Drug and alcohol severity and psychological distress were not predictors of attrition.

There were some differences between males and females in terms of primary drug of abuse, as well as problem severity in several areas measured by the ASI composite severity scores. For women, the most common primary drug of abuse was alcohol (60%), followed by cocaine (17%), then benzodiazepines (9%), cannabis (6%), and opiates (6%). For men, alcohol was also the most commonly used primary drug (52%), followed by cocaine (29%), then cannabis (12%), benzodiazepines (4%), and opiates (2.4%). There were no differences between males and females in terms of dependence on alcohol [χ^2 (1) = 3.04, p = 0.081] and opiates [χ^2 (1) = 2.98, p = 0.084]. However, women were more likely to be dependent on benzodiazepines [χ^2

(1) = 4.15, p = 0.042], and less likely to be dependent on cocaine [χ^2 (1) = 7.61, p = 0.006] and cannabis [χ^2 (1) = 3.92, p = 0.048].

T-tests used to compare differences between gender on the ASI composite severity scores at intake found that psychological [t (405) = -1.990, p = 0.047], and medical [t (405) = -1.75, p = 0.004] problem severity were greater in the females. Females were also more likely to be taking psychiatric medication at intake [χ^2 (1) = 15.086, p = 0.0001] and to have lifetime history of anxiety or depression [χ^2 (3) = 9.94, p = 0.002].

The analyses conducted on early dropout and survival in treatment had not identified robust predictors among demographic, substance use, and psychological variables examined. The next chapter describes substance use outcomes at 6 months, with comparisons between the EDO and RTD groups.

Table 9: Summary of Cox Regression Proportional Hazards Survival for Determinants of Number of Days in Treatment up to 6 Months (N =391)

Variable	B	Wald (df)	p value	2 LL
Step 1 Step: χ^2 = 26.911 (5) P = 0.0001				2454.32
Age	-0.023	9.655(1)	0.002	
Gender†	-0.320	4.721(1)	0.030	
Marital status††				
Single		4.370(2)	0.113	
Married/ Commonlaw	-0.005	0.001(1)	0.977	
Divorced/Separated/ Widowed	0.334	3.391(1)	0.066	
ASI Employment Composite Severity score	0.625	7.186	0.007	
Step 2 Step: χ^2 (7) =29.023, $\Delta\chi^2$ (2) = 2.321, p = 0.313				2452.001
ASI Drug Composite Severity score	0.924	2.281 (1)	0.131	
ASI Alcohol Composite Severity score	0.176	0.521(1)	0.470	
Step 3 Step: χ^2 (10) =29.185, $\Delta\chi^2$ (2) = 0.144, p = 0.931				2451.858
ASI Psychological Composite Severity score	-0.210	0.32 (1)	0.575	
GSI (SCL-90) score	-0.029	0.03 (1)	0.857	
Total BDI score	0.005	0.21 (1)	0.647	

† Males served as reference group
†† Single served as reference group

ASI-Addiction Severity Index

GSI-Global Severity Index on the Symptom Checklist-90

Chapter 4

Substance Use Outcomes at Six Month Follow-up

The next series of analyses were conducted to examine factors associated with substance use outcomes at 6-month follow-up. A total of 21% of the sample was lost to follow-up at 6 months. In general, patients lost to follow-up were younger [F (1, 403) = 4.239, p = 0.040], with more social problems [F (5, 394) = 0.039, p = 0.007], however, analysis using MANOVAs determined that there were no other significant differences at intake for demographic [F (4,396) = 0.189, p = 0.111], substance use [F (7,380) = 1.156, p = 0.327], or psychological variables [F (6,361) =1.195, p = 0.308].

There were significant differences in follow-up rates between the Early Dropout (EDO) and Retained (RTD) groups. Twenty-nine per cent of the patients in the EDO group were lost to 6-month follow-up, compared to 18% in the RTD group [χ^2 (1) = 5.96, p = 0.015], leaving sample sizes of 109 and 302, respectively. Nevertheless, analysis using MANOVAs also determined that there were no significant differences at intake between the EDO and RTD groups for those lost to follow-up on demographic [F (4,396) = 0.579, p = 0.678], substance use [F (7,380) = 0.835, p = 0.558], social [F (5,394) = 0.384, p = 0.860], or psychological variables [F (6,361) = 2.032, p = 0.061].

The RTD group reduced their substance use more than the EDO group, as indicated by the fact that at 6 months 54.3% of the RTD group compared to 28.4% of the EDO group were abstinent from the primary drug of abuse [χ^2 (1) = 17. 972, p = 0.0001]. The mean number of days of continuous abstinence from the primary drug of abuse was 95.6 ± 4.17 for the RTD group, and 44.5 ± 7.5 for the EDO group [t (344) = –5.35, p = 0.0001].

Comparison between Early Dropout and Retained Groups on Primary Outcome Variables of Substance Use

Two-way ANOVAs with repeated measures were used to compare the EDO versus RTD groups on a number of measures of substance use outcomes including the ASI alcohol and drug composite severity scores, the number of days of primary drug intake, and the number of days of any substance use in the past month at intake and 6-month follow-up.

As shown in Figure 2, analysis of ASI alcohol composite severity scores yielded no main effect for group [$F(1,323) = 0.531$, $p = 0.467$], a significant group by time interaction [$F(1, 323) = 17.65$, $p = 0.001$], as well as a significant effect for time [$F(1, 323) = 66.233$, $p = 0.0001$]. Post hoc analysis using t-tests with a Bonferroni correction were conducted on significant ANOVA findings. Post hoc analysis indicated that there were significant differences between the EDO and RTD groups only at follow-up [$t(324) = 3.254$, $p = 0.001$]. Further post hoc analysis indicated that there were significant differences between the means for the EDO group at intake compared to 6-month follow-up [$t(75) = 2.492$, $p = 0.015$]. These results indicated that despite a short stay in treatment, Early Dropouts did show some improvement in alcohol abuse at 6 months.

The results of the analysis of the ASI drug composite severity scores, the number of days of primary drug intake, and the number of days of any substance use all yielded significant group by time interaction effects as well as significant main effects for group and time, as presented in Figures 3 to 5. Figure 3 shows the results of a two-way ANOVA with repeated measures comparing ASI drug composite severity scores at intake versus follow-up between EDO and RTD groups. The

analysis yielded a significant main effect for group [F (1,322) = 12.031, p = 0.001], a significant group by time interaction [F (1,322) = 14.84, p = 0.0001] and a significant effect for time [F (1, 322) = 37.061, p = 0.0001]. Post hoc analysis showed that there were significant differences between the EDO and RTD groups only at follow-up [t (324) = 4.54, p = 0.0001]. For the EDO group, post hoc analysis indicated that there were no significant differences between means at intake and follow-up [t (75) = 1.132, p = 0.261].

The results of a two-way ANOVA with repeated measures comparing the number of days of primary drug use in the past month at follow-up versus intake between EDO and RTD groups are shown in Figure 4. There was a significant main effect for group [F (1,323) = 14.74, p = 0.0001], a significant group by time interaction [F (1, 323) = 20.56, p < 0.0001], and a significant effect for time [F (1,323) = 39.06, p = 0.0001]. Post hoc analysis showed that there were significant differences between the EDO and RTD groups only at follow-up [t (324) = 6.209, p = 0.0001]. As for the ASI drug composite severity score, for the EDO group, post hoc analysis indicated no significant differences between the mean number of days of primary drug use at intake and follow-up [t (75) = 1.035, p = 0.304].

Figure 5 shows the results of a two-way ANOVA with repeated measures comparing the number of days of any substance use in the past month at follow-up versus intake between EDO and RTD groups. There was a significant main effect for group [F (1,323) = 14.27, p = 0.0001], a significant group by time interaction [F (1, 323) = 25.36, p = 0.0001], and a significant effect for time [F (1,323) = 35.06, p = 0.0001]. Post hoc analysis indicated that there were significant group differences only at follow-up [t (324) = 6.111, p = 0.0001].

Overall, the analyses revealed that the RTD group had a greater degree of improvement in substance abuse than the EDO group at 6 months follow-up, as indicated by the significant group by time interactions for ASI alcohol and drug composite severity scores, as well as the number of days of primary drug use, and the number of days of any substance use in the past 30 days. Therefore, the hypothesis that the RTD group would show significantly less problems in measures of substance use outcome at 6 months compared to the EDO group was supported.

Psychological Problem Severity and Distress

Two-way ANOVAs with repeated measures were used to compare the EDO and RTD groups at intake and follow-up on the number of days of psychological problems in the past month, and the GSI scores from the SCL-90. As shown in Figure 6, analysis of the number of days of psychological problems in the past month yielded no significant main effect for group [$F(1,321) = 1.447$, $p = 0.230$], or group by time interaction effect [$F(1,321) = 0.209$, $p = 0.648$]. There was a significant main effect for time [$F(1,321) = 18.686$, $p = 0.0001$]. The same pattern was seen for the analysis of GSI scores which yielded no significant main effect [$F(1,281) = 0.689$, $p = 0.407$] or group by time interaction effects [$F(1,281) = 0.014$, $p = 0.907$]. There was a significant time effect [$F(1,281) = 66.932$, $p = 0.0001$]. These results pointed to a decline in psychological distress in both groups at 6 months compared to intake, raising the possibility that even the Early Dropouts received some psychological benefit in attending a brief amount of treatment. The hypothesis that the RTD group would show significantly greater improvements in psychological distress compared to the EDO group was not supported.

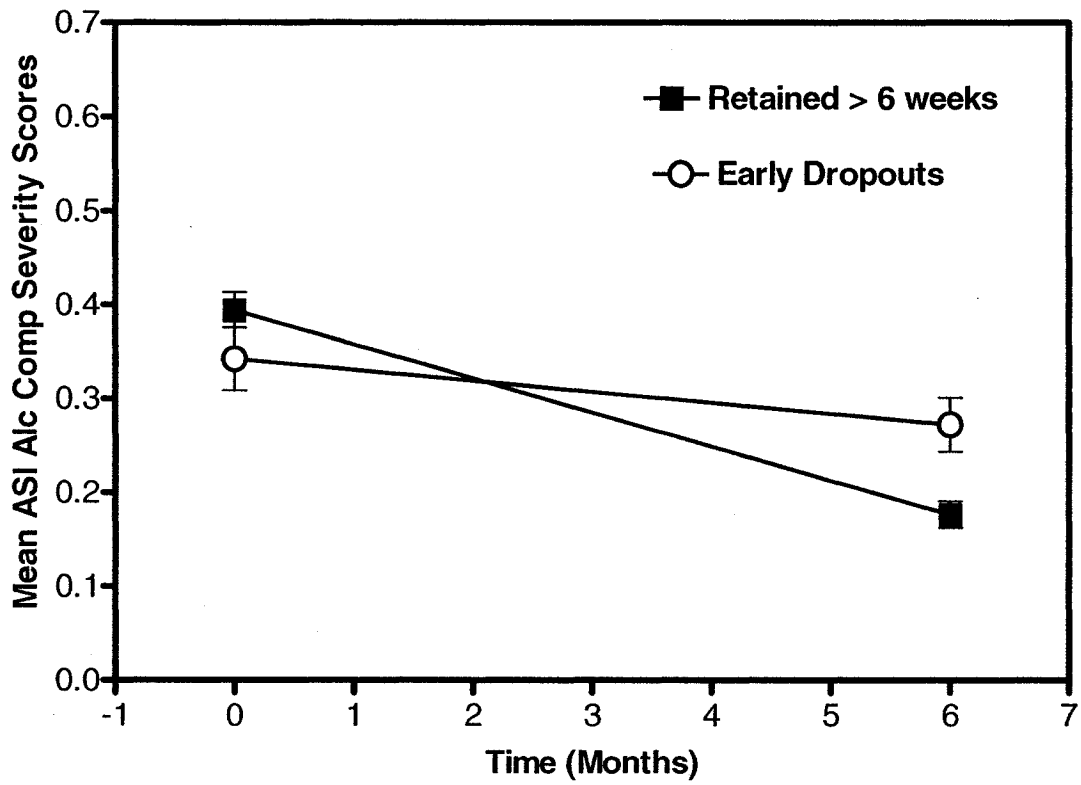

Figure 2. Results of two-way ANOVA with repeated measures comparing ASI alcohol composite severity scores at follow-up versus intake between EDO and RTD groups. Analysis indicated that there was a significant group by time interaction.

Data are the means ± SEM

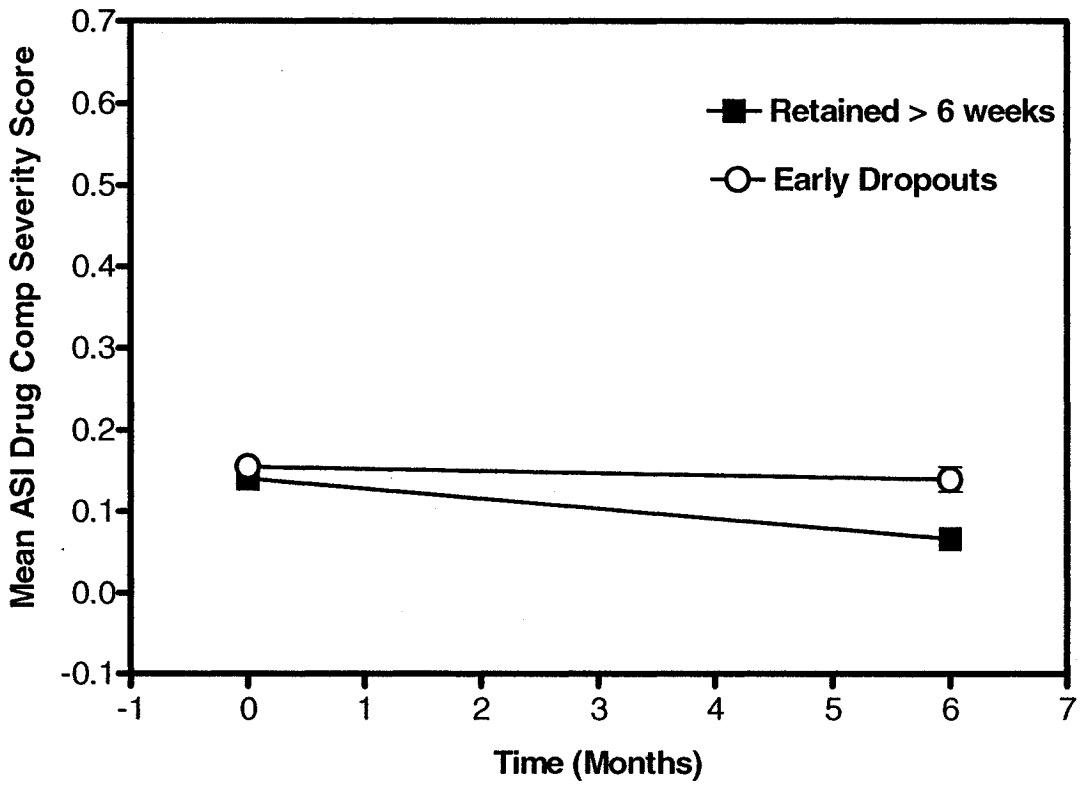

Figure 3. Results of two-way ANOVA with repeated measures comparing ASI drug composite severity scores at follow-up versus intake between EDO and RTD groups. There was a significant main effect for group, a significant group by time interaction, and a significant effect for time.

Data are the means ± SEM.

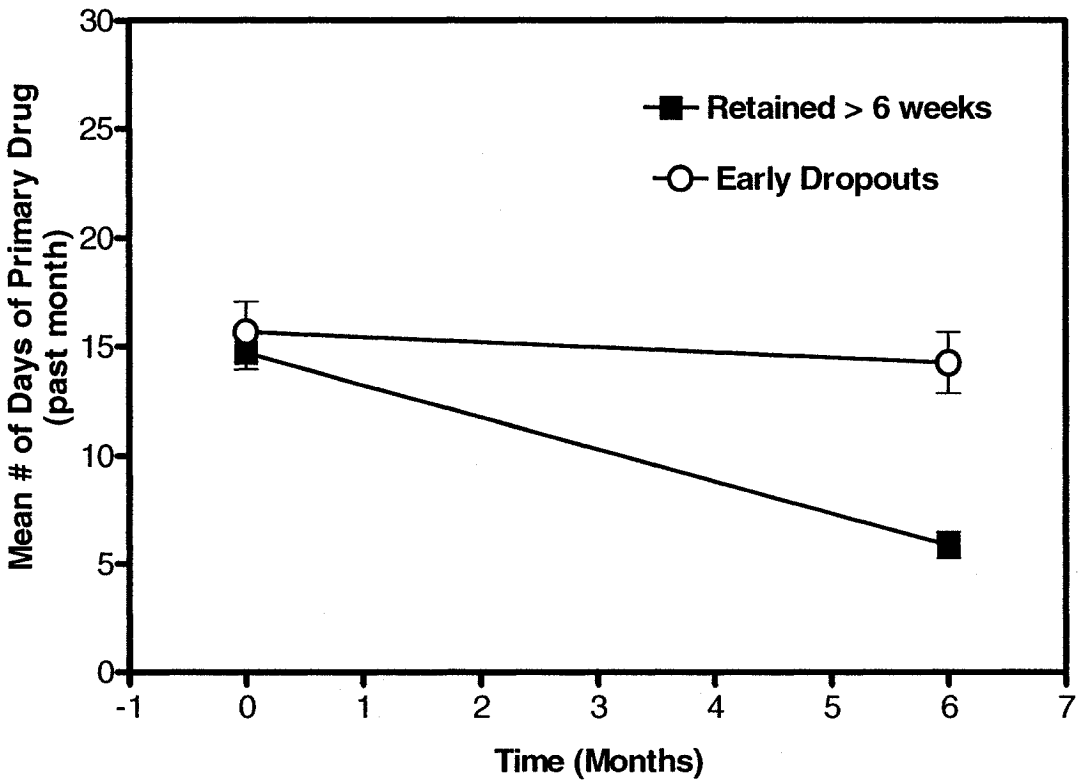

Figure 4. Results of two-way ANOVA with repeated measures comparing the number of days of primary drug use in the past 30 days at follow-up versus intake between EDO and RTD groups. There was a significant main effect for group, a significant group by time interaction, and a significant effect for time.

Data are the means ± SEM.

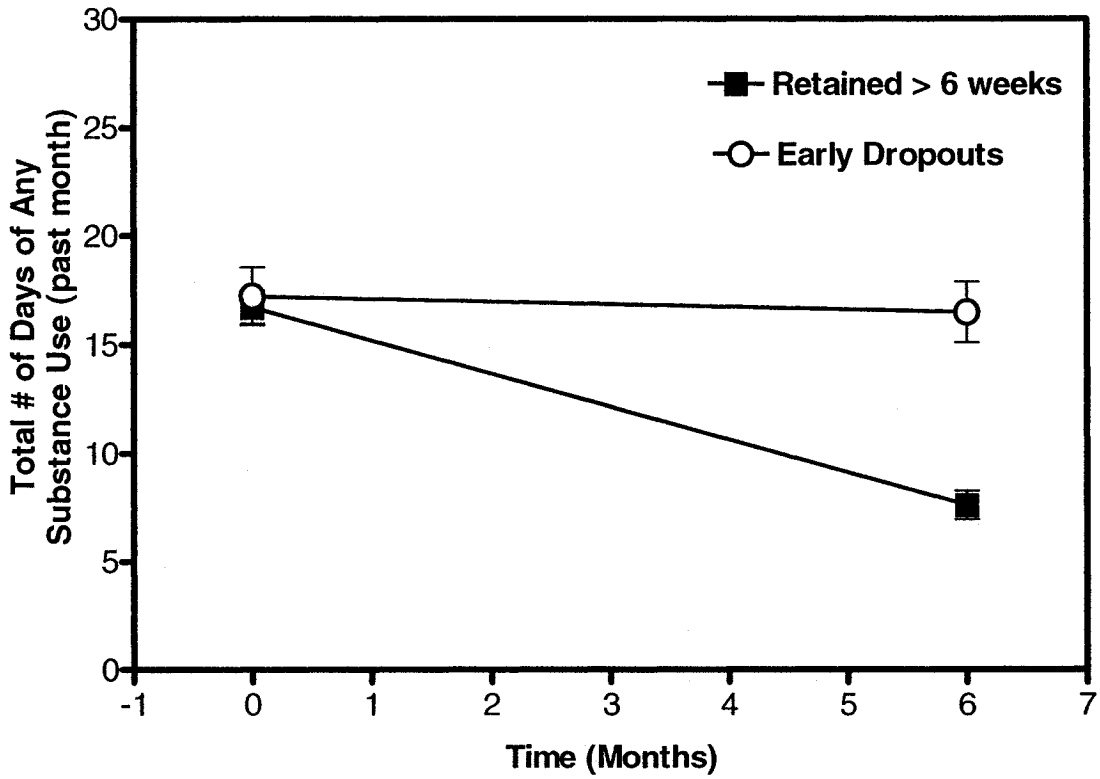

Figure 5. Results of two-way ANOVA with repeated measures comparing number of days of any substance use in the past 30 days at follow-up versus intake between EDO and RTD groups. There was a significant main effect for group, a significant group by time interaction, and a significant effect for time.

Data are the means ± SEM.

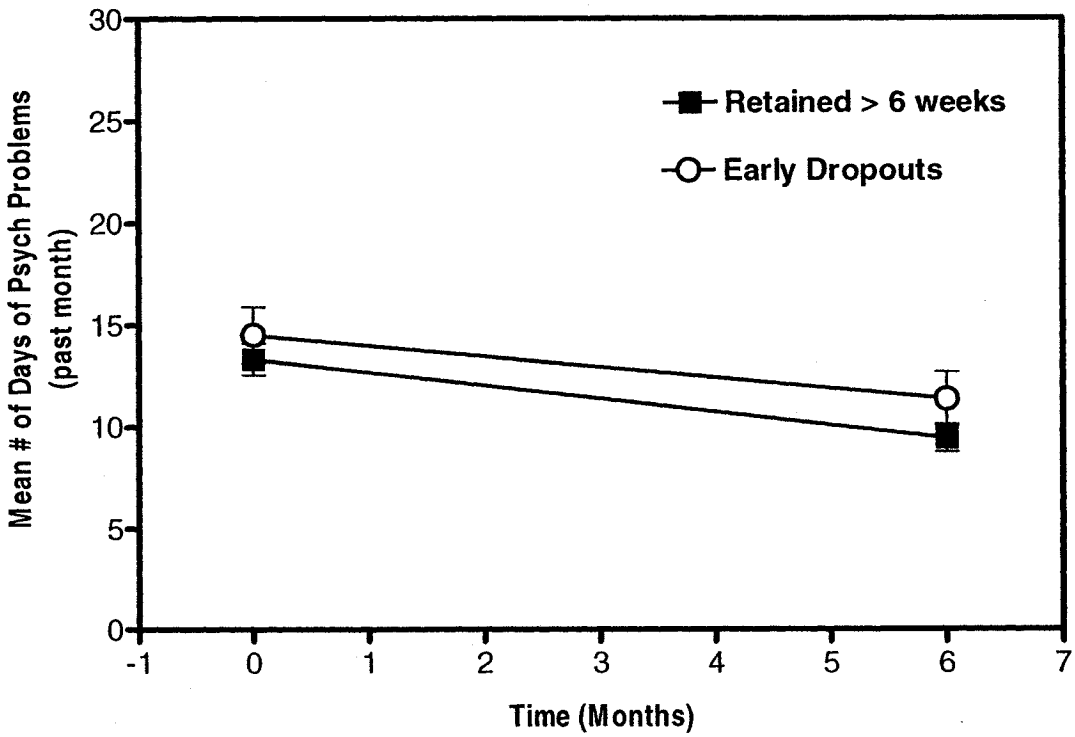

Figure 6. Results of two-way ANOVA comparing the number of days of psychological problems in the past month at follow-up versus intake between EDO and RTD groups. Analysis revealed no main group or group by time interaction effect. There was a significant time effect.

Data are the means ± SEM.

Employment Problems

Given that severity of employment problems had been a predictor of early dropout as well as attrition from treatment over time, the ASI employment composite severity score was also examined. Results of two-way ANOVA with repeated measures comparing ASI employment composite severity scores at follow-up versus intake between the EDO and RTD groups yielded no significant main group [$F(1,323) = 0.211$], or group by time interaction effects [$F(1,323) = 0.26$, $p = 0.609$]. There was a significant time effect [$F(1,323) = 8.85$, $p = 0.003$].

However, it is of note that post hoc analysis indicated that the mean ASI employment composite severity scores at intake were higher in the EDO group than in the RTD group [$t(406) = 2.566$, $p = 0.011$].

Factors Associated with Substance Use at Six Months

The preceding analyses indicated that the RTD group had significantly reduced ASI alcohol and drug composite severity scores at follow-up compared to intake, as well as significantly fewer days of primary drug and other substance use compared to the EDO group. At 6-month follow-up, psychological problems were significantly reduced for both the EDO and RTD groups. Both groups had reductions in mean ASI employment composite severity scores, although the scores for both groups were still moderately high at 6 months.

In order to determine factors associated with substance abuse at follow-up, a hierarchical linear regression analysis was conducted, with the mean number of days of primary drug use in the past month as the dependent variable. The variables selected for inclusion were based on the literature review indicating that sociodemographic, substance use, and psychological factors have been found to be

associated with substance use outcomes, as well as data from this sample indicating that longer time spent in treatment was associated with reduced substance use. The order of entry of the predictor variables was as follows: age, gender, marital status, and ASI employment composite severity score were entered in the first step; the ASI drug and alcohol composite severity scores as measured at intake were entered in the second step; the ASI psychological composite severity scores and the GSI scores at intake were entered in the third step; the total number of days of treatment and the total number of therapy sessions attended were entered in the fourth step of the model.

Table 10 presents a summary of the hierarchical linear regression. In the first step of the regression, but not in the final step of the model, age was significant, accounting for 2% of the variance in the number of days of primary drug use at follow-up. The results indicated that higher ASI alcohol and drug composite severity scores at intake were significantly associated with more days of primary drug use at follow-up. The ASI alcohol and drug composite severity scores at intake accounted for 9% of the variance in the mean number of days of primary drug use at follow-up. The hypothesis that severity of substance abuse at intake would be associated with 6-month outcomes was supported. Psychological problem severity as measured by the ASI psychological composite severity score at intake was not associated with the number of days of primary drug use at 6 months. At 6-month follow-up, the strongest predictors of the number of days of primary drug use in the past month were the number of days spent in treatment and the number of therapy sessions attended. The attendance variables accounted for 19% of the variance in the number of days of primary drug use in the past month, with the total model accounting for 30% of the

variance in days of primary drug use at 6 months. Therefore, the hypothesis that longer treatment retention would be associated with less drug and alcohol use at 6 months was supported.

The following chapter summarizes the results on retention and outcomes at 6 months, and discusses how these findings were used in order to proceed to the next step in the research.

Table 10: Summary of Hierarchical Linear Regression for Variables Predicting Days of Intake of Primary Drug (past 30 days) at 6-Month Follow-up

Variable	R	R2 change	Beta	p value
Step 1				
Step: F (4, 311) = 1.641, p = 0.164 NS	0.144	**0.021**		
Age			-0.032	0.564
Gender			0.025	0.626
Marital status			0.005	0.929
Single				
Married/ Commonlaw				
Divorced/Separated/ Widowed				
ASI Employment Composite Severity Score			-0.002	0.975
Step 2				
Step: FΔ (2, 309) = 15.198, p = 0.0001	0.329	**0.088**		
ASI Drug Composite Severity Score			0.262	0.0001
ASI Alcohol Composite Severity Score			0.126	0.015
Step 3				
Step: F Δ (2, 307) = 0.404, p = 0.668 NS	0.333	**0.002**		
ASI Psychological Composite Severity Score			-0.022	0.737
GSI score			0.080	0.207
Step 4				
Step: F Δ (2,305) = 41.168, p = 0.0001	0.547	**0.189**		
Days in treatment			-0.292	0.0001
Total number of treatment sessions			-0.192	0.005

† Males served as reference group
†† Single served as reference group

ASI-Addiction Severity Index
GSI-Global Severity Index on the Symptom Checklist-90

Chapter 5

I. Discussion of Results

Analysis of the data on retention presented in Chapter 3 indicated that approximately twenty-seven percent of the sample left treatment before 6 weeks, and only 40% remained in treatment for the recommended period of 6 months. Chapter 4 presented results that supported the hypothesis that patients retained longer than 6 weeks in treatment would have greater reductions of substance abuse at follow-up compared to those who left treatment early. Both the Retained and Early Dropout groups showed a decrease in the severity of alcohol problems at follow-up compared to intake. However, at follow-up, patients who remained in treatment longer than those who dropped out before 6 weeks had a greater reduction in severity of alcohol abuse, and no clinically meaningful reductions in the severity of drug abuse, the number of days of primary drug intake, or the number of days of any drug use in the past month compared to intake. Clearly, those who remained longer in treatment were using less drugs and alcohol at 6 months. Contrary to the hypothesis stating that improved psychological and social functioning at follow-up would be associated with greater time spent in treatment, both Early Dropout and Retained groups had improvements in psychological problems at follow-up. Although the both groups showed significant reductions in severity of employment problems, at follow-up the early dropouts as well as the retained patients were still experiencing moderately high levels of employment difficulties.

Younger, divorced, separated, or widowed patients, as well as those with more severe employment problems, were more likely to drop out of treatment before 6 weeks. Therefore, the hypothesis that patients who were younger and less socially stable would be more likely to drop out of treatment early was supported. The

hierarchical linear regression analysis examining factors associated with substance use at 6 months indicated that client characteristics of age, gender, marital status, or employment problems were not associated with the frequency of primary drug use at follow-up. A previous study conducted at the Addictions Unit that had examined the impact of social support on substance use outcomes and retention found that those with low social support tended to drop out of treatment sooner, but that the association between functional social support and reduced drug and alcohol consumption was modest (Dobkin et al., 2002). In that study, however, the role of specific support for reduced substance intake was not examined. Although improved treatment retention has been reported by including a significant other or spouse in the therapy (McCrady, 1986; Sisson & Azrin, 1986; Higgins et al., 1994), during the first phase of treatment in the Addictions Unit fewer than 20% of patients examined complied with the request of having a support person accompany them to a session with the primary therapist, indicating that inclusion of a significant other in the treatment is a challenge. In addition to many factors that could interfere with participation of a significant other, it is also possible that some patients lack a supportive ally as they endeavour to reduce drug and alcohol consumption, and in this sample patients who were married or cohabitating were less likely to drop out of treatment early. Longabaugh et al. (1993) found that alcoholic patients were more likely to experience problems during recovery when they were strongly committed to relationships with significant others who provided little support for abstinence. Support for reduced substance intake from family and friends has been associated with better substance use outcomes (Beattie et al., 1997), and it is possible that younger patients had a reference group of peers who were less supportive of

abstinence or were themselves engaged in abusive drug or alcohol behaviours. The fact that married or cohabitating patients were less likely to drop out of treatment early may indicate that support from a spouse is a motivator for remaining in treatment, but the majority of patients attending the treatment did not include a support person in the therapy when invited. The complexity of interactions among patients' social networks, resources specific for support of abstinence, and how these factors influence treatment retention rates and substance use outcomes deserves further research attention.

Many patients were experiencing employment problems, and greater problems in this area were associated with treatment attrition. Additional services or referral for employment counselling, job search, or vocational training may be added incentives for some patients to remain in treatment. At 6 months, many patients in both groups were still experiencing a moderately high degree of employment problems, and amelioration of these problems may only become apparent over longer periods of time with remission of substance dependence or provision of specific training.

Although gender was not associated with early dropout, the Cox proportional hazard regression analysis examining predictors of attrition over time revealed that males dropped out of treatment sooner than females over the 6-month follow-up period. Gender may also be related to primary drug of abuse. Women were less likely than men to be dependent on cocaine and cannabis, and more likely to be dependent on benzodiazepines. Differential survival rates in treatment over 6 months between males and females may have been a reflection of different lifestyles, patterns of use, and requirements for medical intervention associated with dependence on prescribed medication versus illicit drugs. It is possible that a combination of primary

drug, gender, and personality factors may have contributed to men leaving treatment sooner, and these factors could be explored in future research. Another factor related to differential rates of attrition over time between men and women could have been the greater degree of psychological distress in females. The women in this study had more medical, psychological, and employment problems than men, similar to other studies showing greater social and emotional problem severity in females in substance dependence treatment (Brown et al. 1994; McCaul et al., 2001). In contrast with the present results, some studies have shown that women with more severe psychiatric problems, unstable mood, and interpersonal deficits were less likely to complete treatment (Brown, Huba, & Melchior, 1995; Brown, Melchior, & Huba, 1999; Haller, Miles, & Dawson, 2002). At the present time it is not possible to resolve the discrepancy in findings regarding differential treatment attrition for men and women. In the current study greater medical and psychological problem severity was associated with longer treatment stays for women. Perceived utility of services and an empathetic therapist counselling style have been identified as in-treatment factors associated with greater treatment retention for women (Fiorentine et al., 1998). Given that treatment at the Addictions Unit afforded the opportunity to access services for medical and psychiatric problems in addition to substance dependence, provision of care for these problems may have played a role in retaining women longer in treatment. The availability of a women's group offering support for gender-specific problems in the second phase of therapy may have also had an impact on retaining women longer in treatment.

Severity of Substance Dependence

The examination of factors associated with early dropout from treatment indicated that severity of substance abuse was not associated with early dropout, therefore, this hypothesis was not supported. However, the hypothesis that more severe substance abuse at intake would be associated with poorer drug and alcohol outcome variables at 6-month follow-up was supported. Hierarchical linear regression showed that drug and alcohol severity at intake were modestly associated with the number of days of primary drug use in the past month at follow-up, similar to findings in other reports (Carroll, Power, Bryant, & Rounsaville, 1993; Simpson, Joe, & Broome, 2002).

Other studies have failed to find an association between severity of substance dependence, primary drug group, and retention in treatment (McCaul et al., 2001; Patkar et al, 2004). However, a previous study conducted at the Addictions Unit had determined that patients dependent on opiates were at higher risk for dropout during the first month of treatment (Paraherakis et al., 2000). In the Paraherakis et al. study (2000), 12% of patients were dependent on opiates, whereas in the present study, opiate addicts were only 3.6% of the 411 patients in the sample, so that differences in retention for opiate dependent patients were likely not discernable due to the small number of patients. Survival analysis conducted on the three primary drug groups showed that those who were dependent on drugs, versus alcohol, were found to be more likely to leave treatment sooner over the 6 months of treatment.

Severity of Psychological Problems

Patients who had more severe psychological distress at intake, based on ASI psychological composite severity scores, Global Severity Index or Beck Depression scores were not more likely to drop out of treatment early. Also in the hierarchical linear regression model, the ASI psychological composite severity scores and the GSI scores were not associated with the number of days of primary drug use at follow-up, indicating that severity of psychological problems at intake was not associated with drug and alcohol outcomes at follow-up. The reason for the lack of association between psychological problem severity at intake and substance use outcomes may be, as stated above, that the clinic provided psychiatric services of assessment, early treatment, and referral for concurrent psychiatric disorders. The Addictions Unit multidisciplinary approach consisted of clinicians with expertise in addiction and mental illness. The psychiatrists on staff were addiction specialists who worked closely with primary therapists and were actively involved in assessment and ongoing evaluation of patient progress. It is possible that the lack of differential rates of dropout for patients experiencing more psychological distress were related to the availability of treatment for comorbid psychiatric disorders at the Addictions Unit (Charney et al., 2001). Other investigators have noted improved outcomes when appropriate services and referrals are provided for patients with co-existing psychiatric disorders (McLellan et al., 1994; Moos et al., 2001; Moos & Moos, 2002).

Information about patient characteristics including motivation, self-efficacy, and personality features were obtained in order to enhance understanding of additional psychological factors that could be associated with early dropout.

Motivation and Self-Efficacy

Having explored the commonly examined sociodemographic, substance use, and psychological predictors of treatment retention, the subsequent analyses explored associations between motivation, self-efficacy and treatment retention in a subset of the main study sample. These analyses indicated that baseline motivation and self-efficacy were not associated with early dropout; therefore these hypotheses were not supported.

Motivation at intake, which was examined in the subset of the main sample, was not associated with early dropout from treatment, and this negative finding has also been reported in other studies of outpatient treatment (Fiorentine et al., 1999; Blanchard et al., 2003; Patkar et al., 2004). One reason for the lack of association between pre-treatment motivation and early dropout may be that treatment-seeking patients, by the very fact of presenting for treatment, report relatively high levels of motivation at intake. Equally plausible is the notion that motivation has an indirect effect on other factors such as therapeutic alliance and level of engagement during the therapy sessions that in turn impact retention (Simpson, Joe, Rowan-Szal, & Greener, 1997). The mediating effects of motivation on variables related to within-treatment processes were not analyzed in this study.

The lack of association between scores on the DTCQ and early dropout indicates that whether or not a patient stays in treatment is likely more related to change in self-efficacy that is occurring over time, rather than pre-treatment levels of self-efficacy. Congruent with help-seeking behaviour, patients starting treatment would likely believe that they are unable to resist all high-risk drinking or drug use situations. However, over time, if there is little improvement in self-efficacy, patients

may become discouraged and leave treatment, or give up efforts to reduce substance intake.

Personality Factors

Inhibition, a personality factor measured by the DAPP, approached a significant level of association with early dropout from treatment in the subset of patients who completed this questionnaire at intake [t (117) = 2.015, p = 0.046], although the value was not significant when corrected for multiple comparisons. It would not be surprising that patients with a restricted range of expression and intimacy problems had more difficulty remaining engaged in treatment, especially since group therapy was the main treatment modality offered in the program. Some patients may not be good candidates for group therapy, and if staffing resources permit, may be more likely to remain engaged in treatment if offered the option of individual counselling. Contrary to the hypothesis, patients with higher scores on personality factors of emotional dysregulation and dissocial behaviour were not more likely to drop out of treatment early. Rather than having a direct impact on rates of retention, it is possible that affective instability and antisocial traits of personality interact with other variables in the treatment process, such as the therapeutic alliance, that were not measured in this study. A confrontational versus supportive therapist style has been associated with poorer drinking outcomes (Miller, Benefield, & Tonigan, 1993), but response to the therapist may be associated with factors of the patient's personality as well. To date, similar to the psychotherapy literature, inconsistent results have been found on associations between clinician personality characteristics and outcomes in substance dependence treatment (Najavits, Crits-Cristoph, & Dierberger, 2000). Examination of the interaction between patient and

therapist personality characteristics and therapist style may provide more clues about how the dynamics of this relationship may influence retention. A more in depth assessment of personality features of patients and exploration of intervening processes that are associated with therapist effects could provide useful information about patient-therapist matching.

After exploration of a wide array of patient factors, it was determined that demographic characteristics, but not severity of substance abuse or psychological problems, were modestly associated with early dropout from treatment. Motivation and self-efficacy and the personality factors of emotional dysregulation and dissocial behaviour examined were not directly associated with early dropout from treatment. Factors associated with attrition over time were similar to those associated with early dropout, in that demographic characteristics, but not severity of substance use and psychological problems, showed modest associations.

Treatment Attendance

The hierarchical linear regression also supported the hypothesis that longer time in treatment and more session attendance would be associated with reduced primary drug intake at 6 months. Greater treatment attendance demonstrated the strongest association with fewer days of primary drug intake in the past month at follow-up. Since the method of the research was a naturalistic follow-up study, without control for treatment conditions or other influencing factors, no conclusions about improved outcomes resulting from treatment can be drawn, but the association between better treatment attendance and improved outcomes described in the majority of the literature was supported.

II. Discussion of the Results on Retention and Substance Use Outcomes from a Health Services Perspective

The evidence gathered up to this point in the study revealed the following: close to 30% of patients left treatment before completing 6 weeks; only 40% completed 6 months of treatment; there were no robust predictors for early dropout and attrition over time; longer stays in treatment were associated with improved substance use outcomes at 6 months. These facts were then examined from the perspective of service provision. Criteria used to assess the success of health care provision include effectiveness, equity, acceptability, and efficiency (Liddell, 1990; Crombie,1996; Beck & Miners, 2001). These criteria were used to review the results from the naturalistic follow-up study.

Effectiveness measures the outcome of an intervention as part of routine clinical treatment and care. Since this was a naturalistic study, the reasons for improvement cannot be attributed to treatment, nevertheless, the substance use outcomes at 6 months clearly showed that those who stayed in treatment longer had reduced their substance use compared to those who dropped out early. Therefore, for the 40% who remained in treatment at 6 months, attending treatment was associated with reductions in drug and alcohol consumption. However, the fact that less than half of those who sought treatment completed it as designed translates into reduced treatment effectiveness for the majority of patients. Treatment effectiveness measures the success of an intervention based on routine care, and although better outcomes were associated with longer treatment, only a minority adhered to the recommendation of 6 months of treatment. Outcomes for the Early Dropout group indicated some reduction in alcohol severity, as well as a reduction in psychological

distress, and a slight improvement in employment problems. Therefore, even a minimal amount of treatment was associated with some improvements at 6 months.

Equity refers to accessibility of treatment services to a wide range of clientele in need of the service. To ensure that services intended for particular groups are used, information on the prevalence of a disorder and sociodemographic and cultural characteristics of those who use the services should be routinely collected (Beck & Miners, 2001). Patients receiving treatment at the Addictions Unit were representative of a typical treatment-seeking population in Montreal. This is confirmed by similar sociodemographic, and substance use characteristics in comparison to those patients in a three-site study of substance abuse treatment in the Montreal area (Brown et al., 2002; Brown et al., 2002a). However, women, minorities, and those with less education were underrepresented in the sample. Inclusion of other services such as child care, translators, volunteers, and social resources with links in the community could be explored as methods to potentially reduce barriers to treatment that may arise from social, language, and cultural differences.

The acceptability criterion relates to the extent to which treatment is acceptable not only to those who provide it, but also to those intended to receive it (Beck & Miners, 2001). Patient satisfaction surveys are one method of determining acceptability of the intervention. Another method to infer acceptability may be to evaluate the number of patients who complete the planned intervention. This naturalistic study of 411 patients followed at the Addictions Unit demonstrated that many patients participated in treatment for much shorter periods than the planned 6-month intervention. It has been estimated that up to 90% of substance abusers do not seek specific treatment for addiction at specialized centres (Sobell, 2000). However,

many people seek other medical, social, or psychological services for complications resulting from drug or alcohol dependence. Reasons why substance abusers avoid specialized treatment are not well understood, but one suggestion has been that available addiction services lack appeal and acceptability to the majority of people with substance use disorders (Marlatt & Kilmer, 1998). Provision of consumer-friendly services may be an effective way of encouraging people to seek treatment, by reducing stigma associated with substance dependence and providing alternative interventions (Marlatt & Kilmer, 1998; Sobell & Sobell, 2000). These points may be viewed from the perspective of the self-selection concept (De Leon, 1998). It is possible that patients who remained in treatment at 6 months had selected to continue in the program because of a "good fit" between the services offered and compatibility with their own views of change. Adherence to treatment over 6 months required regular attendance to group therapy for 6 months, acceptance of the goal of total abstinence, and demonstrated reduction in substance use through participation in mandatory urine screening. Some patients may not have agreed with these conditions for continued participation in the program. Patients may be more likely to reduce substance use if the treatment approach is consistent with their preferences (De Leon, 1998; Brown et al., 2002). Although evidence was obtained in the present study for an association between improved substance use outcomes and better retention in treatment, it seemed that the treatment program was not "a good fit" for the majority of patients. Therefore, patients and therapists alike were working within a system of treatment delivery that benefited those who were able to remain in the program until completion, but the majority did not complete the treatment as it was designed.

Efficiency relates to the resources required to provide a specific service and achieve a specific outcome. Costs refer to expenses incurred to provide the intervention or the service (Beck & Miners, 2001). Cost-effectiveness analysis of addiction treatment is complex due to the fact that addiction treatment can lead to several, not necessarily correlated, important outcomes (Sindelar, Jofre-Binet, French, McLellan, 2004). A study of cost-effectiveness conducted on a random sample of 99 drug treatments in the U.S. comparing four treatment modalities found that outpatient drug-free treatment was more cost-effective than inpatient, residential, and outpatient detoxification, underlining the fact that more intensive treatment is not always more effective or efficient (Mojtabai & Zivin, 2003). A preferable method of analyzing long-term economic value of treatment for the individual and the society is a cost-benefit analysis, but this area of research is highly specialized and is only beginning to become standardized and based on real-life treatment services (Cartwright, 2000; French, Salome, Sindelar, & McLellan, 2002). An in-depth analysis of efficiency and costs were beyond the scope of this study, but several facts about efficiency related to the use of services were noted. A potential loss in terms of efficiency was that although some patients may not have needed the full 6 months duration of treatment, an alternative for shorter treatment was not available. Therapists were working within a service that recommended longer durations of care. Although many patients may have self-selected to leave treatment, dropout is not equivalent to therapeutic discussion about treatment needs, options, and preferences. There was also a loss of efficiency in services as a result of dropout since therapists were spending time with phone calls attempting to track down nonattenders, and leaving files "open" in the

event that patients might return to treatment. Both of these facts resulted in fewer new patients being taken into treatment over a period of time.

III. Implications of the Results for Treatment Services

The question that arose as a result of the data analysis on outcomes on retention and substance use presented above was how to offer effective interventions for most people seeking treatment. The analysis of early dropout had not provided clues about strong predictors that could be used to plan changes in the treatment program. A pragmatic response to the question of dropout was formulated based on rates of treatment retention gathered up to this point.

Substance dependence is a chronic disorder with periods of remission and relapse, and many people will participate in more than one treatment episode over a long period of time. Offering treatment approaches of varying intensity and duration may increase the likelihood of more people receiving at least some effective treatment. A "stepped care" approach operates under the assumption that the initial treatment of choice is the procedure that is the least intrusive to the patient's lifestyle, is efficient in terms of treatment resources, and has a reasonable chance of being effective (Sobell & Sobell, 1993). Since decision-making about further treatment in a stepped care model is based on outcomes, this approach may be cost-effective because as interventions become more extensive, the proportion of patients needing each successive level of intervention is relatively small compared to the original population entering treatment (Sobell & Sobell, 1993). Since the waiting period for treatment at the Addictions Unit of the MUHC was an average of 3 months, an obvious benefit to providing a stepped care approach would be a reduction in the

waiting period, given that only those needing additional interventions would receive longer treatment.

An additional advantage of a stepped care approach is that patients may be more likely to accept a treatment approach that they perceive as less lengthy or demanding, and one that is based on their progress in treatment. Since the findings from the data on treatment retention in this study indicated that the majority of patients participated in a much shorter duration of treatment than the planned 6-month intervention, a practical approach to improving treatment was to examine methods of delivering services in the way that they were being used by most patients. From the perspective of health services research, the practical results and implications of research include changing, adding, or removing certain elements of the existing treatment program that are amenable to change with a reasonable amount of resources and effort (Pendergast et al., 2000). Therefore, the creation of a self-contained brief intervention was a natural development based on the already existing structure and interventions of the 6-week Phase I treatment program. The major difference would be that the treatment would be designed to be effective and completed by 6 weeks. This approach could respond to some patients' preferences and requirements for shorter treatment, and include evaluation for additional treatment on an as-needed basis.

A major caveat to providing brief intervention for substance dependence is that treatments requiring less commitment may have higher acceptance and retention rates, but they may also be less likely to produce clinically meaningful treatment effects (De Leon, 1998). Henceforth, an evaluation of the effectiveness of a brief intervention for patients with drug and alcohol problems was needed before this could

be introduced into the standard treatment program, and the next step in this programmatic research involved the development, implementation, and evaluation of a brief intervention in the clinic. The next chapter provides the background literature review, the methodology, and outcomes for the randomized trial of brief intervention that was conducted in the Addictions Unit.

Chapter 6

Brief Intervention

Introduction

There is growing evidence that brief interventions are as effective as more intensive therapy for alcohol problems. The research into the effectiveness of brief interventions has a long history, albeit it is not without controversy (Heather, 1995, Drummond, 1997, 2002). Brief interventions focus on changing specific behaviours, and may range from a short advice session up to several structured counselling sessions (Babor, 1994). Over the years, numerous studies of brief interventions have been conducted in primary health care and specialized treatment settings, with patients varying in degree of alcohol severity. Brief interventions can be classified into two distinct approaches based on the setting and the population receiving the interventions (Heather, 1995, 1996 Moyer et al., 2002). In primary health care settings with patients seeking medical care rather than specific treatment for alcohol problems, brief interventions may include a brief assessment with feedback, behavioural modification, setting goals, and writing a contract for change (Barnes & Samet, 1997). Brief interventions in these settings are advice-driven, low in structure, and delivered by treatment providers not specialized in substance abuse (Heather, 1995, 1996). By comparison, brief interventions delivered in substance abuse treatment settings are more structured, based on theories of alcohol dependence treatment, and are provided by addiction specialists (Heather, 1995, 1996). In primary health care settings brief interventions are most often compared with "no treatment" control conditions, whereas in specialized addiction treatment settings,

brief interventions are usually compared to existing extended treatment (Moyer et al., 2002).

Edwards, Orford, & Egert (1977) conducted one of the first studies examining brief intervention delivered in a treatment setting. Their study was conducted in an outpatient alcoholism clinic in Britain, with 100 married male patients randomly assigned to the "Advice" condition" or to the "Standard Treatment" condition. Both groups were followed prospectively up to 12 months. The Advice condition consisted of one session with the patient and his wife. The need for abstinence was stressed and strategies that could be applied toward this goal were outlined. The Standard Treatment condition included sessions with a psychiatrist, medications, social worker assistance with employment and housing problems, inpatient detoxification if necessary, and an introduction to Alcoholics Anonymous. Their results showed no significant differences in outcomes between the two treatment conditions at the 12-month follow-up assessment, nor were there interactions between treatment intensity and degree of dependence on alcohol, demonstrating that those severely dependent on alcohol improved in both conditions (Edwards & Taylor, 1994).

The Effectiveness of Brief Intervention

A handful of studies have examined the effectiveness of brief interventions by comparing outcomes to extended treatments in specialized treatment settings. Some studies have demonstrated that there were no significant differences between brief and extended treatment in terms of reduction in alcohol consumption (Harris & Miller, 1990; Bien, Miller, & Tonigan, 1993; Langenbucher, 1994; Heather, 2001; Project MATCH, 2003). In a meta-analytic review conducted by Moyer et al. (2002) the effect sizes for 34 studies in non-treatment-seeking and 20 studies in treatment-

seeking populations were examined. The investigators found that in 20 studies of treatment-seeking populations, there were parallel improvements in outcomes for brief intervention and extended treatment, and effect sizes over four follow-up points were equivalent, without differences due to the severity of alcohol dependence. The results of the meta-analysis indicated that brief interventions performed as well as extensive treatments for follow-up periods of up to 6 months (Moyer et al., 2002).

Despite the many positive reports of outcomes for brief intervention, there are caveats to consider before drawing conclusions about the effectiveness of brief interventions in treatment settings. In many studies, small sample sizes, poorly-defined outcome measures, and a restricted range of problem severity reduce the generalizability of findings to clinical settings (Heather, 1995). In Moyer et al.'s (2002) meta-analytic review, of the 20 studies of brief intervention in treatment-seeking populations, only seven studies were adequately powered, and 50% of the studies excluded patients who met diagnostic criteria for alcohol dependence, drank at high levels or for a long period of time, or had received previous treatment. Still little is known about the effectiveness of brief interventions in "typical" clinical settings.

Project MATCH provides an example of the use of a brief intervention in an efficacy trial for the treatment of alcoholism (Project MATCH, 2003). This was the largest multi-site randomized clinical trial of psychotherapies ever conducted and was designed to test *a priori* patient-treatment matching hypotheses for patients with alcohol problems. The three outpatient treatment modalities chosen for comparison were: Motivational Enhancement Therapy (MET), Cognitive Behavioural Therapy (CBT), and Twelve-Step Facilitation (TSF). MET consisted of 4 individual sessions conducted over 12 weeks, and can therefore be classified as a brief intervention. Both

CBT and TSF were conducted in 12 individual sessions over a 12-week period. A total of 1726 patients were enrolled in nine community sites across the United States. Findings indicated that patients in all three treatment conditions showed equal improvements at one and three-year follow-ups. Unfortunately, the trial provided only limited conclusions about the effectiveness of brief intervention. The study sample was restricted in terms of substance dependence and psychiatric problem severity, and the extensive research interviews and special attention provided by participation in the research reduced the generalizability of findings to "real world" clinical situations and typical treatment-seeking patients (Finney, 1999; Heather, 1999).

Most of the studies evaluating outcomes of brief interventions have focused exclusively on individuals with alcohol problems. Few data are available on the effectiveness of brief interventions for the "typical" treatment-seeking individual. In reality, as the description of the study sample in Chapters 3 and 4 showed, over 50% of patients seeking treatment are abusing a secondary substance, over 30% are dependent on illegal or prescription drugs, and up to two thirds have co-existing DSM-IV Axis I or Axis II disorders. These figures are consistent with other investigations (Kranzler & Rounsaville, 1997; Verhuel, Van Den Brink, Hartgers, 1995; Paraherakis et al., 2000; Charney et al., 2001; Dobkin et al., 2002; Verheul et al., 2002). In a small nonrandomized study (N = 33) it was found that cannabis abusers who participated in a brief intervention reported a reduction of cannabis use and improved health and social functioning post-treatment (Lang, Engelander, & Brooke, 2000). Few studies have been designed to evaluate the optimal duration of treatment for cocaine users and, in general, research is lacking concerning patient predictors of response to various treatment lengths (Carroll, 2000).

Rationale for Conducting a Brief Intervention Study

As described above, there is limited evidence for the effectiveness of brief intervention in a typical substance dependence treatment-seeking population. Brief intervention as an alternative to conventional therapy of longer duration may make treatment more inviting to first time patients or to those not willing to commit to abstinence-oriented treatment of longer duration. Brief intervention for some patients could also reduce the over-all cost of treatment. Therefore, availability of an empirically supported brief intervention could potentially improve acceptability, equity, and efficiency of treatment services in an outpatient community treatment setting for substance dependence. However, in order to offer brief intervention as an alternative to standard treatment, the effectiveness of the intervention needed to be established. The study described in Chapters 3 and 4 demonstrated that Early Dropouts had less improvement in substance dependence compared to the Retained. Nevertheless, the Early Dropouts had some improvements in alcohol abuse, and equivalent improvements to the Retained group in psychological distress at 6 months. The standard clinic treatment was designed to be conducted over a duration of 6 months, and the implicit message of less attendance was that treatment was "not successful". The literature on brief intervention indicates that brief intervention may be as effective as extended treatment for alcohol problems, but there are inconclusive outcomes for typical patients seeking treatment under usual clinical conditions. The study on retention and outcomes had also shown that 60% of patients did not complete treatment. Therefore, the study was designed to determine if patients assigned to a specific brief intervention would show substance use outcomes similar to those in conventional treatment

Study Objectives

The objective of the present study was to evaluate the effectiveness of brief intervention (BI) in comparison to conventional therapy (CT) in terms of outcomes for substance use and psychological distress. This was accomplished by conducting a randomized clinical trial where patients were assessed at intake, randomly assigned to treatment condition, and then re-assessed 6 months after intake.

Hypotheses and Outcome Variables

The primary outcome variables were: (1) the total days of continuous abstinence from primary drug; (2) the ASI alcohol and drug severity composite scores; and (3) the number of days of drug and alcohol problems in the past month.

⇒ Hypothesis 1-Patients dependent on alcohol and drugs in the CT condition would show significant improvements on primary outcome variables at 6-month follow-up compared to patients in the BI condition. (Predicted CT > BI)

The secondary outcome variable was related to change in psychological distress, measured by the Global Severity Index (GSI) on the Symptom Checklist-90 (SCL-90). The following hypothesis was based on the results from the follow-up study indicating that the Retained and Early Dropout groups had equivalent improvements in measures of psychological distress at 6-month follow-up.

⇒ Hypothesis 2- Patients in the CT and BI treatment conditions would show significant and equal improvement on the GSI scores at 6 months.

Description of Treatment Conditions

The study had a comparison group rather than a control group. In a clinical setting where provision of some form of treatment is required and expected, a no-treatment control condition was not an ethically or practically viable option.

In the **Brief Intervention (BI)** condition, each patient was treated by a single therapist and attended one individual session per week, for a total of 5 individual sessions. Table 11 outlines the main themes covered in each of the individual sessions. The BI was designed to be administered over a period of 6 weeks, however some flexibility allowed patients to complete the sessions over a slightly longer period of time when necessary (e.g. due to scheduling conflicts or need to cancel sessions). The sessions designed by senior Addictions Unit staff, derived partially from the principles of motivational interviewing (Miller & Rollnick, 1991), and used concepts and materials from the Project Match Treatment Manuals (Volume 2-Motivational Enhancement Therapy; Volume 3-Coping Skills Therapy; 1995). The sessions had the following characteristics: 1) emphasis on promoting the concept of self-efficacy and personal responsibility for change; 2) evaluation and enhancement of the patient's motivational level and readiness for change through an empathetic (non-judgmental) counselling style; 3) education of the patient about strategies to produce change and prevent relapses. Thus, the therapist recognized, accepted, and worked with ambivalence and reluctance for change. The objective was to move the client toward acknowledging current problems, developing a desire to change, setting specific goals, and developing action plans for dealing with high-risk situations. The intervention employed a number of tools throughout therapy including alcohol/drug

self-monitoring records, risk/benefit analysis, reading and homework assignments related to identifying high-risk situations. The entire BI program was placed in a treatment manual, along with descriptions of each session's goals and methods, client handouts, and homework assignments.

The **Conventional Therapy (CT)** condition was comprised of the standard treatment program described in Chapter 2, consisting of an initial 6-week period (Phase I) followed by Phase II with a total expected treatment duration of 6 months. During Phase I each patient was treated by a single therapist and attended one group psychotherapy session + one individual session per week. The group sessions were open, and comprised of 8 to 10 members with mixed primary substances of abuse. The individual sessions comprising the Phase I CT and BI conditions were the same as those outlined in Table 11. This procedure was instituted in order to be able to produce a BI program that differed from CT on the dimensions of treatment intensity and duration, while controlling for content and therapeutic style in so far as possible. Therefore, patients in the BI condition received the same messages regarding treatment goals (e.g. abstinence), exposure to the same concepts (coping with cravings, identifying triggers) and the same motivational counselling style as those in CT, over the five individual sessions.

At the end of the 6-week Phase I period, CT patients were transferred to Phase II where they attended group psychotherapy, once or twice weekly. As described in Chapter 2, group therapy was eclectic, combining psychodynamic, supportive, and relapse-prevention interventions.

Table 11. Summary of themes addressed in individual therapy sessions for BI and CT

Session 1	-Establishing rapport through discussion and feedback from the assessment interview -Addressing motivation for changing substance use -Conducting an Advantages / Disadvantages analysis with the patient -Addressing ambivalence as a natural part of change -Providing a rationale for coping strategies in the upcoming therapy sessions -Setting goals for treatment
Session 2	-Providing education about the phenomena of urges and cravings -Introducing behavioural strategies including monitoring of urges, record-keeping about alcohol and drug use, activity scheduling -Introducing cognitive strategies including rehearsed coping statements and visual imagery
Session 3	-Including a significant other in the session in order to evaluate the patient's support network -Sharing goals of treatment and approaches for reducing substance use with the significant other -Discussing and practicing alcohol and drug refusal skills
Session 4	-Identifying high-risk situations -Fine-tuning of coping for urges and cravings -Problem-solving for high-risk situations: handling triggers by choosing strategies of avoidance, postponement, preparation, or seeking social support, where appropriate
Session 5	-Providing education about the relapse process and warning signals -Discussing relapse prevention strategies and development of a personal plan

Study Procedure and Patients

Approval for the study was obtained from the MUHC ethics committee (see Appendix B). Since the study was designed for outpatients, exclusion criteria were similar to those for the naturalistic follow-up study. However, for this study, patients requiring additional input from a psychiatrist were excluded in order to keep the number of individual therapeutic meetings to 5 sessions. Specifically, patients requiring any medical or psychiatric intervention for control of withdrawal symptoms, or initiation or titration of medication were excluded. These exclusion criteria resulted in 35.7% of patients who were assessed being excluded from the study. In addition, patients who were legally mandated to treatment, abstinent from substances for more than one month, or had received substance abuse treatment in the previous 6 months were excluded. The flow diagram in Figure 7 lists the reasons for exclusion from the study.

After the standard clinic assessment was conducted (as described in Chapter 2, page 47), eligible patients were invited by the research assistant to participate in the study. Informed consent was obtained, and randomization was carried out by the research assistant according to study protocol. Following randomization the patient was informed of treatment assignment and given an appointment with the available primary therapist to start treatment the following week. Patients and staff were not blind with regards to the assigned treatment conditions.

A total of 72 patients were entered into the study. Thirty-eight patients were randomized to the CT group and 34 were randomized to the BI group.

Figure 7. Brief Intervention Study Alogorithm

238 assessments booked
↓
56 DNA or cancelled
↓
182 assessments conducted→110 excluded

Reasons for exclusion	
Needed psychiatric intervention	49
Needed medical management of withdrawal	16
Other treatment in past 6 months	19
> 1 month abstinence	15
Refused participation in the study	7
Legally mandated to treatment	2
Unknown	2
Total	110

72 randomized:

CT	**BI**
38	34

6-month follow-up:

CT	**BI**
21(55.3%)	19 (55.9%)

The interview, questionnaires, and follow-up procedures were identical to those of the naturalistic follow-up study sample (N = 411) described in Chapter 2. In summary, all patients were assessed with the Addiction Severity Index, a DSM-IV interview with a psychiatrist, and were administered the Beck Depression Inventory (BDI), and the Symptom Checklist-90 (SCL-90) at intake.

Total therapy contact in both the BI and CT conditions was carefully monitored throughout treatment. The type and duration of all visits to the clinic (i.e. individual sessions with primary therapist, group therapy sessions, psychiatrist visits) were automatically registered in a database by the clinic receptionist. Additional information on patient contact (i.e. by telephone) was recorded in the Primary Care Record, filled out by each therapist on a monthly basis. Total clinic contact was tabulated on weekly basis throughout treatment. In addition, the results of random urine screens (dates, number of urine samples requested and provided, number of drug tests, number and drug class of positive results) were obtained from the clinic charts on a monthly basis.

Data Analyses

T-tests and Chi-square analyses were used to describe sample characteristics stratified by treatment condition, as well as substance abuse outcomes and rates of treatment attendance. Subsequently, treatment groups were compared on substance abuse and psychological functioning over time using two-way ANOVA for repeated measures [between factors of group (CT versus BI) and time [intake versus 6-month follow-up]. Primary outcome variables were assessed using an intention-to-treat analysis, with data analyzed according to randomly assigned treatment condition. The decision was made that missing data would not be imputed from the first session to follow-up since there was only one follow-up point at 6 months. In addition, the two-way ANOVA for repeated measures required a complete data set for each patient at both time points. The plan was that outcome data would also be analyzed according to patient compliance with treatment condition. However, despite attempts to retrieve patients at 6 months, low follow-up rates prohibited analysis of substance use outcomes based on compliance.

Calculation of sample size and power was based on data from the follow-up study comparing outcomes for primary drug of abuse between the Early Dropout and the Retained groups as described in Chapters 5 and 6. The effect size was determined from the following equation (Streiner, 1990): Effect size = $\underline{X_T - X_C}/SD_c$

Where X_T is the mean of the treatment group, X_C is the mean of the control group, and SD_C is the standard deviation of the outcome measure of the control group.

Based on this equation, comparing outcomes for primary drug of abuse between the Retained and the Early Dropout groups, the effect size was 0.88.

Although the differences in outcomes from the follow-up study could not be attributed to treatment, the sample was comprised of similar patients to this randomized trial, and the objectives of the first study were also to examine outcomes for brief versus longer durations of treatment. Therefore, 0.85 was used as an estimate of effect size to determine the required sample size for the study. The Dupont Power and Sample Size Program (Dupont & Plummer, 2003) was used to calculate sample size based on the following parameters: alpha level set at 0.05; power of 0.80; effect size of 0.85; and a 1:1 ratio. Power calculations indicated that comparison of groups using independent paired t-tests would require 23 patients per group. Based on the previous study described in Chapters 3 and 4 in which the overall follow-up rate was 79%, taking an approximate 20% loss to follow-up into account, at least 54 patients would be required for the trial. A total of 72 patients were recruited in order to provide an adequate sample size for this initial trial of BI in the clinic. However, as the following section will describe, loss to follow-up in this sample was greater than expected, with the result that the study was underpowered to conduct some of the planned analyses, and additional treatment effects may not have been detected.

Characteristics of the Sample at Intake

Tables 12, 13, and 14 display the demographic, social, substance use, and psychological characteristics of the sample at intake, stratified by treatment condition. Table 12 shows the sociodemographic characteristics indicating that the sample was almost two thirds male, over half were working full or part-time, and most patients had completed basic high school education. When compared to BI group, the CT group did have significantly more social problems at intake, as measured by the ASI social composite severity scores [$t(70) = 2.90$, $p = 0.005$]. However, the groups were

Table 12: Sociodemographic Characteristics at Intake Stratified by Treatment Group

	CT N = 38	BI N = 34
Age	39.61 (1.85)	37.50 (1.64)
Gender		
Male	60.5%	61.8%
Number of Years of education	14.11 (0.46)	13.23 (0.42)
ASI Employment Composite Severity score	0.408 (0.05)	0.445 (0.06)
Employment Status		
Unemployed	23.7%	26.5%
Employed (full or part-time)	63.2%	58.8%
Retired/homemaker/student	13.2%	14.7%
ASI Social Composite Severity score*	0.32 (.04)	0.16 (.03)
Marital Status		
Single	36.8%	38.2%
Married/Common Law	42.1%	41.2%
Widowed/Separated/Divorced	21.1%	20.6%
Living situation		
Spouse/Children	52.6%	45.5%
Parents/siblings	21.1%	12.1%
Friends	2.6% (1)	12.1%
Alone/other	23.7%	30.3%
Days of family problems (past month)	5.2 (1.28)	2.1 (1.0)
Days of problems with people (past month)	2.1 (0.74)	0.71 (0.25)
ASI Legal Composite Severity score	0.067 (0.02)	0.051 (0.02)

Groups were compared using Student's t-tests, and Chi-square analysis
Values are percentages or means (± SEM)
* $p < 0.05$ corrected for multiple comparisons

ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

not different in terms of marital status, living situation, legal problems, or days of conflict experienced with other people in the past month.

Substance Use Variables at Intake

There were no significant differences between groups at intake in terms of the majority of substance abuse variables as shown in Table 13. Having a secondary substance of abuse was more frequent in the CT group, although this difference was not significant when corrected for multiple comparisons. In addition, the BI group had a lower mean ASI drug composite severity score at intake, but this was not significant when corrected for multiple comparisons. About one third of both groups had received some form of treatment for substance abuse in the past.

Psychological Variables at Intake

Table 14 indicates that there were no significant differences between the CT and BI groups for variables related to psychological distress at intake. The most commonly occurring additional DSM-IV Axis I disorders were mood disorders and anxiety disorders. More than half of the patients in both groups had undergone previous outpatient treatment for psychological problems.

Table 13: Substance Use at Intake Stratified by Treatment Group

	CT N = 38	BI N = 34
Number of years of problem drug use	8.6 (1.14)	9.8 (1.53)
Primary drug		
Alcohol	31.6%	50.0%
Drugs	23.7%	11.8%
Alcohol + Drugs	44.7%	38.2%
Number of days of primary drug use (past 30 days)	17.0 (1.75)	14.4 (1.80)
Previous substance abuse treatment	31.6%	33.3%
Secondary drug of abuse	44.7%	20.6%
ASI Alcohol Composite Severity score	0.45 (0.05)	0.44 (0.04)
ASI Drug Composite Severity score	0.13 (0.02)	0.08 (0.02)
ASI Medical Composite Severity Score	0.27 (0.05)	0.23 (0.06)

Groups were compared using Student's t-tests, and Chi-square analysis
Values are percentages or means (± SEM)
* $p < 0.05$ corrected for multiple comparisons

ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

Table 14: Psychological Variables at Intake Stratified by Treatment Group

	CT N = 38	BI N = 34
Presence of DSM-IV Axis I disorder other than substance dependence	39.5%	44.1%
Previous treatment for psychological problems (lifetime)		
Inpatient	16.2%	12.1%
Outpatient	57.1%	66.7%
GSI SCL-90	0.98 (0.11)	0.84 (0.12)
Beck Depression Inventory score	15.53 (1.76)	14.32 (1.90)
ASI Psychological Composite Severity score	0.22 (0.035)	0.22 (0.032)
Taking medication for psychiatric disorder (past 30 days)	10.5%	17.6%

Groups were compared using Student's t-tests, and Chi-square analysis
Values are percentages or means (± SEM)
* $p < 0.05$ corrected for multiple comparisons

ASI-Addiction Severity Index, composite scores range from 0 to 1.0, with higher scores indicating greater problem severity.

Treatment Attendance and Status at Follow-up

Table 15 provides the results of t-tests and Chi-square analyses comparing rates of attendance between groups. Twenty-one per cent of CT patients, and 44% of BI patients completed the 5 individual therapy sessions over 6 weeks [$\chi 2$ (1) = 4.391, p = 0.036].

Adherence to treatment condition was examined by determining the number of patients who completed their assigned treatment. Chi-square tests determined that 42% of patients randomized to the CT group remained in treatment up to 6 months, and 65% of the patients randomized to the BI group completed the 5 individual therapy sessions [$\chi 2$ (1) = 3.68, p = 0.055]. As expected, the CT group did receive substantially more therapy than the BI group in the first 6 weeks and up to 6 months.

Follow-up data at 6 months was provided by 55.3% of the CT group and 55.9% of the BI group [t (70) = 0.052, p = 0.959]. Analysis using MANOVA determined that there were no significant differences at intake between those lost to follow-up on demographic [F (5,64) = 0.737, p = 0.978], social [F (6,60) =1.932, p = 0.090], substance use [F (7,60) =1.218, p = 0.307], or psychological variables [F (6,44) = 0.592, p = 0.735] compared to those who were retained at follow-up.

Those who had completed randomized assignment to either CT or BI treatment conditions were more likely to attend 6-month follow-up. Among the CT group 76.2% of those attending the 6-month follow-up interview had completed the standard treatment of 6 months. Among the BI group 78.9% who attended follow-up had completed the 5 sessions of the BI. Therefore, the intention-to-treat analysis on outcomes provides results primarily for those who were adherent to treatment condition.

Table 15: Therapy Attendance and Additional Treatment at 6-month Follow-up

	CT N = 38	BI N = 34
Remained in CT for > 6 weeks	68.4%	
Completed 5 individual sessions over 6 weeks	21.1%	44.1%
Completed 5 individual sessions over 3 months	47.4%	64.7%
Remained in CT treatment up to 6 months	42.1%	
Number of sessions attended in 6 weeks*	6.2 (0.79) (group + ind.)	3.6 (0.31) (ind. only)
Total number of sessions attended over 6 months*	18.50 (2.96)	3.91 (0.31)

Groups were compared using Student's t-tests and Chi-square analysis
Values are percentages or means (± SEM)
* $p < 0.05$ corrected for multiple comparisons

Results

Comparison of Outcomes at Six Months Between the BI and CT Groups

Substance Use at Six Months

Table 16 provides the overall rates of primary and secondary drug consumption for the CT and BI groups at 6-month follow-up. There were no significant differences between groups on any of the substance use outcomes. The CT and BI groups appeared to be equivalent in terms of abstinence from primary drug of abuse, the number of days of primary or secondary drug use, and the number of days of alcohol and drug problems in the past month. The results demonstrate that approximately half of the patients in both treatment conditions were abstinent from their primary drug of abuse at 6 months, and that about half were still using a secondary drug. Importantly, there were no significant differences in the percentage of CT or BI patients who had an additional treatment episode in the Addictions Unit or elsewhere by 6 months.

Two-way ANOVA with repeated measures with the factors of group (CT versus BI) and time (intake versus 6-month follow-up) was used to examine measures of substance use outcomes, including the ASI alcohol and drug composite severity scores, as well as the number of days of alcohol and drug problems in the past month.

Table 16: Substance Use Outcomes at 6-Month Follow-up

	CT N = 21	BI N = 19
At 6 months		
Abstinent from primary drug	57.7%	47.4%
Continuous days abstinence from primary drug	90.0 (13.9)	89.21 (16.8)
Use of a secondary drug	42.9%	47.4%
Additional treatment episode	25%	21.1%
Based on past 30 days		
Number of days of primary drug intake	3.90 (2.01)	5.47 (1.79)
Number of days of any substance intake	6.45 (2.47)	9.79 (2.14)
Number of days of alcohol problems	3.86 (2.01)	1.11 (0.55)
Number of days of drug problems	5.14 (2.37)	4.42 (2.32)
Number of days of intake of secondary drug	5.00 (2.17)	5.30 (2.04

Groups were compared using Student's t-tests and Chi-square analyses
Values are percentages or means (± SEM)
* $p < 0.05$ corrected for multiple comparisons

As shown in Figures 8 and 9, both the CT and BI groups had significantly reduced the severity of alcohol abuse at the time of 6-month follow-up. Results of the two-way ANOVA with repeated measures comparing ASI alcohol composite severity scores (Figure 8) indicated that there was a significant effect for time [F (1,38) = 24.604, p = 0.0001], but no significant main effect for group [F (1,38) =0.23, p = 0.633], or group by time interaction [F (1,38) = 2.403, p = 0.129]. Similarly, results of the two-way ANOVA with repeated measures comparing the mean number of days of alcohol problems in the past 30 days (Figure 9) demonstrated a significant effect for time [F (1,38) = 0.344, p = 0.0001], and no significant main effect for group [F (1,38) = 1.873, p = 0.179], or group by time interaction [F (1,38) = 0.228, p = 0.636].

Figure 10 shows that there were no differences between groups for the severity of drug problems over time. Two-way ANOVA with repeated measures comparing ASI drug composite severity scores at intake versus follow-up for the CT and BI groups yielded a significant effect for time [F (1,38) = 7.87, p = 0.008], and no significant main effect for group [F (1,38) = 0.501, p = 0.483] or group by time interaction [F (1,38) = 0.19, p = 0.658]. Comparison of the mean number of days of drug problems in the past month at intake and follow-up resulted in no significant reduction for either the CT or BI patients, as demonstrated by the results of the two-way ANOVA with repeated measures shown in Figure 11. The analysis yielded no main effect for group [F (1,38) = 0.523, p = 0.474], no significant group by time interaction [F (1,38) = 0.498, p = 0.485], and no significant effect for time [F (1,38) = 0.116, p = 0.735].

The preceding analyses suggested that there were equivalent reductions in alcohol consumption for both the CT and BI groups at follow-up compared to intake.

Therefore, the hypothesis that the CT group would show significant improvements in alcohol abuse compared to the BI group at follow-up was not supported. The reduction of drug abuse was less evident for both groups at follow-up. Hence, the hypothesis that the severity of drug abuse would be significantly reduced in the CT group compared to the BI group at follow-up was not supported.

Psychological Distress at Six Months

A two-way ANOVA with repeated measures was conducted to compare the CT and BI groups on the GSI scores calculated from the SCL-90 at follow-up versus intake. The analysis for the GSI scores resulted in a significant effect for time [$F(1, 27) = 7.5$, $p = 0.011$], and no significant main effect for group [$F(1, 27) = 0.067$, $p = 0.798$], or group by time interaction [$F(1, 27) = 0.168$, $p = 0.685$]. Therefore, the hypothesis that there would be no differences between the CT and BI groups was supported, however, the sample size for this analysis was small ($n = 30$).

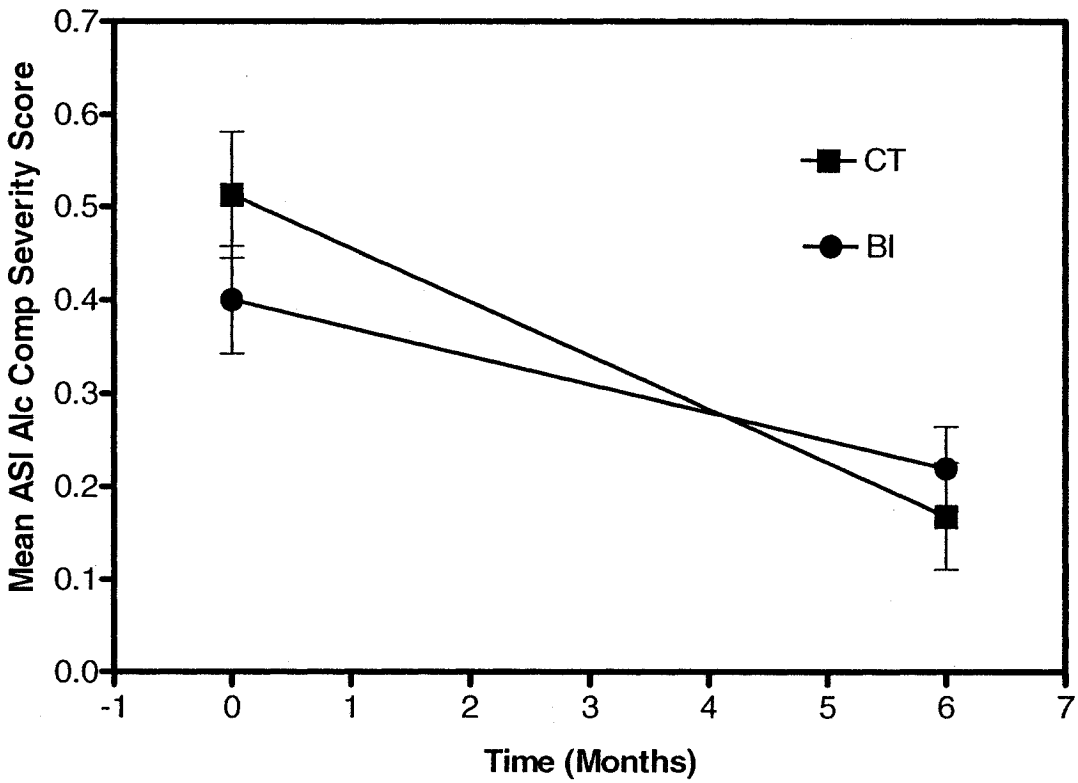

Figure 8. Results of the two-way ANOVA with repeated measures comparing ASI alcohol composite severity scores at follow-up versus intake between CT and BI groups. Analysis indicated that there was a significant effect for time, and no significant main effect for group, or group by time interaction.

Data are the means ± SEM.

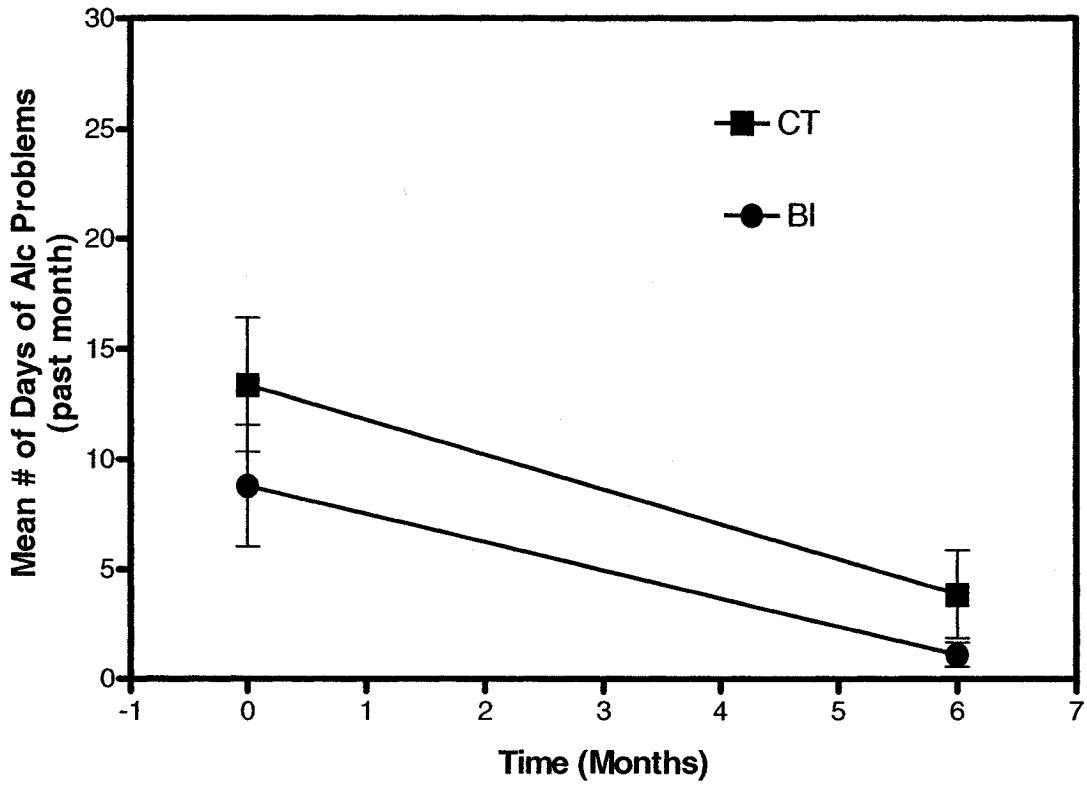

Figure 9. Results of two-way ANOVA with repeated measures comparing the mean number of days of alcohol problems in the past 30 days at follow-up versus intake between CT and BI groups, demonstrating a significant effect for time, and no significant main effect for group, or group by time interaction.

Data are the means ± SEM.

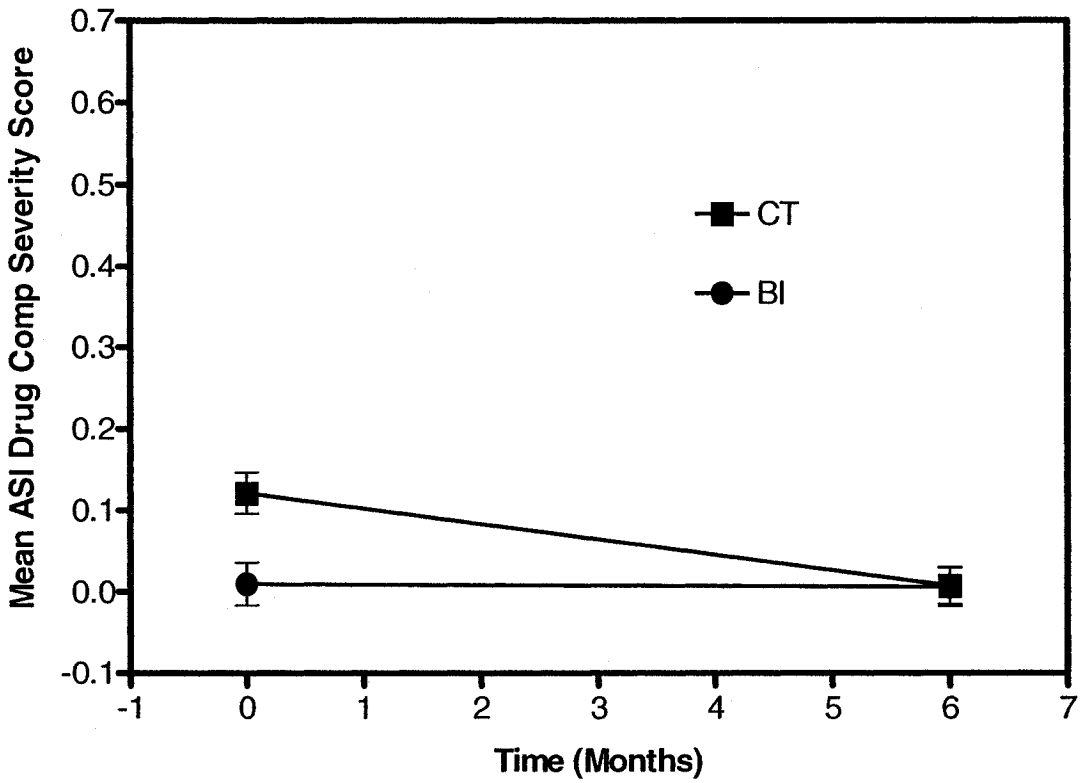

Figure 10. Two-way ANOVA with repeated measures comparing ASI drug composite severity scores at follow-up versus intake between CT and BI groups yielded a significant effect for time, and no significant main effect for group, or group by time interaction.

Data are the means ± SEM.

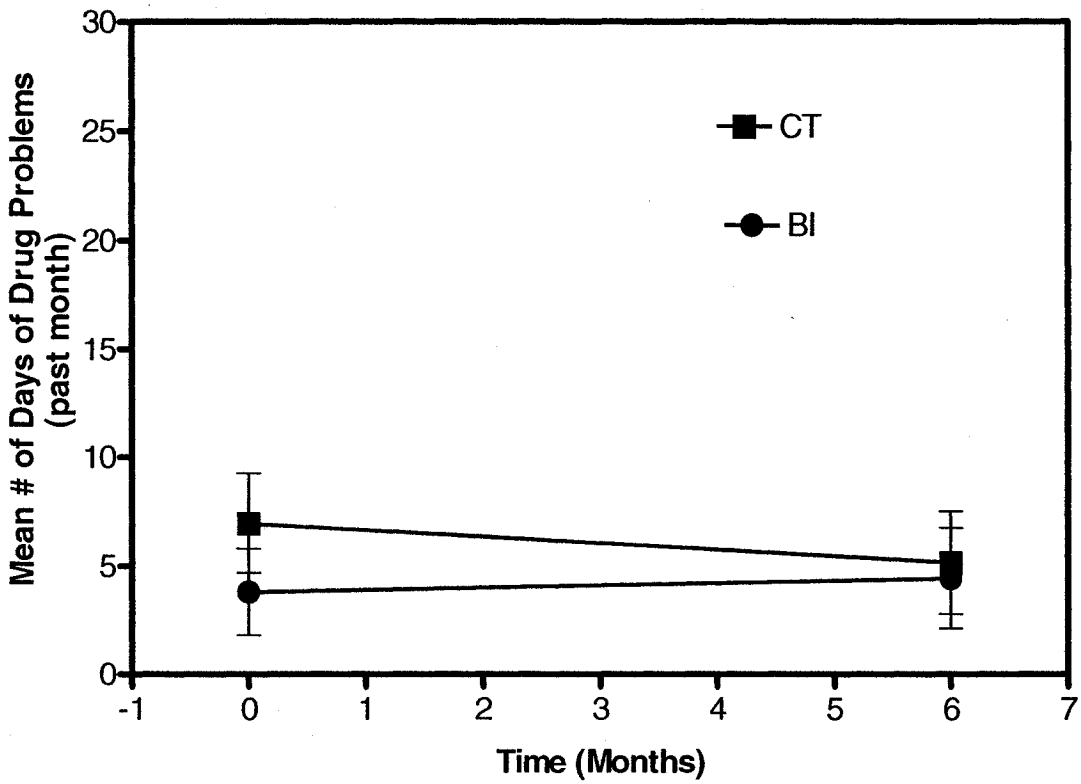

Figure 11. Results of the two-way ANOVA with repeated measures comparing the mean number of days of drug problems in the past 30 days at follow-up versus intake between CT and BI groups. The analysis yielded no main effect for group, no significant group by time interaction, and no significant effect for time.

Data are the means ± SEM.

Summary and Discussion

Both treatment groups reduced alcohol consumption at 6-month follow-up, as measured by significant decreases in primary outcome measures of the ASI alcohol composite severity scores, and the number of days of problem alcohol use. Although the ASI drug composite severity scores showed a decrease over time, there were no significant decreases in the number of days of drug problems over time for either group. Thus, the hypothesis that the CT group would show greater improvements on substance use outcomes compared to the BI group was not supported for alcohol problems and inconclusive for drug problems. The lack of significant findings for drug problems may have been due to the low severity of drug dependence in the sample due to the exclusion of patients requiring any medical intervention for withdrawal symptoms, thereby excluding patients dependent on high dose opiates or benzodiazepines. In summary, outcomes based on an intent-to-treat analysis of the BI compared to the CT indicated that patients in both treatment conditions had equivalent reductions in alcohol abuse at 6-month follow-up, but that no definitive conclusions about improvement in drug abuse could be made. In a meta-analysis of addiction treatment, it was determined that the effect sizes for specific treatment versus treatment as usual were considerably higher for alcohol dependence (0.26–0.92) than in corresponding studies on opiate (0.19–0.65) and cocaine (0.24-0.67) dependence (Berglund, 2005). Therefore, the finding that alcohol-dependent patients in both the CT and BI groups fared better than drug-dependent patients at 6 months fails to support the superiority of CT, and indicates that further investigation of the BI as an effective treatment for other drug dependence is warranted.

Attrition occurred in both treatment conditions. Forty-seven per cent of BI patients completed 5 individual therapy sessions, and 42% of CT patients completed treatment according to primary therapist or remain in treatment up to 180 days. Examination of rates of attendance in the BI and CT groups showed that 44% of the BI patients, and 21% of the CT patients completed the 5 individual sessions over 6 weeks. These rates of attendance may indicate that patients assigned to a brief intervention are more likely to maximize the time available to them in treatment, but that some flexibility in scheduling may increase session attendance.

Improvements on the GSI score at follow-up were evident for the CT and BI groups, but the resulting sample was inadequately powered and an interaction effect may have been undetected.

The sample size limited the analytic strategy since the use of regression models for prediction of differential outcomes between treatment groups was prohibited. A more robust study evaluating the effectiveness of the intervention for a larger number of patients would permit exploration of other variables associated with differential substance use, including primary drug of abuse, patients satisfaction with treatment, personality factors, concurrent DSM-IV Axis I disorders, and additional support for abstinence outside treatment. Examination of these factors would enhance prediction of who would benefit from brief intervention thereby enabling clinicians to make treatment recommendations based on empirical data.

Although the number of patients in the study precludes drawing definitive conclusions about the effectiveness of the BI, the improved and equivalent substance use outcomes for alcohol problems that were evident justify further work in this area. Key questions about the delivery and effectiveness of brief intervention that need to be addressed

include: the optimal number of sessions in order to maximize attendance and effectiveness, the differential effects for drug and alcohol problems, the effectiveness of brief intervention delivered in a group format, the types of patients who will benefit, and the time period for follow-up and monitoring (Anderson, 2002).

Chapter 7

Summary of the Research and Discussion

This research was prompted by questions about the delivery and utilization of treatment services in an outpatient chemical dependency clinic, with a view to evaluating the process of dropout and implementing a solution based on research findings. Data derived from this clinic sample were used to answer key questions about the nature of predictors for early dropout from treatment and substance use at 6 months.

The naturalistic follow-up study found that close to 30% of patients left treatment before 6 weeks, and 60% of patients left treatment before 6 months. Age, marital status, and severity of employment problems were associated with early dropout. Similarly, age, gender, and employment problems were associated with attrition from treatment over 6 months. Greater severity of substance abuse and psychological problems at intake were not associated with early or later attrition from treatment. Also not associated with early dropout from treatment were measures of motivation, self-efficacy, and personality factors of emotional dysregulation and dissocial behaviour examined in a subset of patients. These findings supported the conclusion that few client characteristics predictive of dropout can be identified at treatment onset.

The treatment variables of the length of time spent in treatment and the number of treatment sessions attended were the most robust predictors of substance use at 6 months, accounting for 19% of the variance in the days of primary drug intake. The severity of drug and alcohol abuse at intake was modestly associated with substance use at 6 months, accounting for 9% of the variance in the number of days

of primary drug intake in the past month at follow-up. The severity of psychological problems and psychological distress at intake were not associated with substance use at 6 months.

The analyses also demonstrated that patients who completed treatment showed considerable reduction in severity of substance abuse. However, only 40% received the "recommended" dose of treatment. A pragmatic response to these results was undertaken and a new brief intervention was designed. The objectives of the brief intervention study were to determine if the standard treatment program would be more effective than a planned brief episode of treatment. Despite the limited sample size, it was found that patients dependent on alcohol in both the CT and BI treatment conditions showed significant and equal improvements on primary outcomes for alcohol abuse, but that there was inconclusive evidence to draw conclusions on drug abuse outcome variables.

Methodological Considerations

There were a number of limitations that deserve consideration in interpreting results from both studies described in the thesis.

The loss to follow-up in the naturalistic sample of 411 was 21%, and was close to 45% in the Brief Intervention study. Attrition from treatment and loss to follow-up is a common problem in substance dependence treatment evaluation (Desmond, Maddux, Johnson, & Confer, 1995; Edwards & Rollnick, 1997; Brown et al., 2002; Brown et al., 2002a). Due to the losses to follow-up in both studies, two caveats require attention in interpretation of the results. The first caveat to consider is the bias that may have resulted from the fact that those who attended follow-up were different in some way from those who did not. It is of note, however, that

comparisons between those retained versus those lost to follow-up on a variety of intake variables yielded no significant differences between groups. It is possible that early treatment experiences were closely linked to attendance for research follow-up, since patients in both studies who were adherent with treatment and attended more scheduled sessions were more likely to attend 6-month follow-up. Stout, Brown, Longabaugh, and Noel (1996) found that patients' baseline characteristics had limited impact on attendance to research follow-up, but that patients' participation and engagement early in treatment was strongly associated with attendance to follow-up. Efforts were taken to maximize attendance to follow-up through several strategies including: informing patients about the time for follow-up at intake, obtaining locator information, as well as a contact list, providing $20 gift certificates for attending the interview or return of questionnaires in the case of a phone contact, and providing fare for public transport if required (Desmond al., 1995; Cottler, Compton, Ben-Abdallah, Horne, & Claverie, 1996). In addition to these measures, follow-up efforts were begun 2 weeks before the 6-month date and efforts were extended for up to 3 months. Phone interviews were conducted when patients could not be scheduled for a meeting in person.

The second caveat to consider when interpreting study results is that loss to sample size at 6-months in the naturalistic study and the Brief Intervention trial resulted in missing data in both studies. Whether patients who do not attend follow-up are doing better or worse, than those who do attend cannot be known and both assumptions are plausible (Sobell, 1978; Aspler & Harding, 1991). Those doing better may not return because they do not see the need, have moved on, and those doing worse may be more easily located because they are still in the treatment system and

experiencing problems (Desmond et al., 1995). Stout et al. (1996) found that relapse rates did not negatively affect attendance to 48-month follow-up, and in fact, those with more hospitalizations and more impairment from alcohol were less likely to refuse follow-up. Since there was only one time point for evaluation of outcomes at 6 months in studies conducted in the current research, it was decided not to impute data from the baseline assessment. Imputing values for missing data may be a reasonable procedure when data have been collected over several follow-up points (Nich & Carroll, 2002). Assessment of outcomes at 3 and 12 months could provide additional data about progress related to changes over time. However, adding follow-up interviews requires consideration of the increased costs and the potential influence of the research interviews versus treatment on outcomes, especially in the evaluation of a brief intervention. An example of how research interviews can overshadow treatment is demonstrated by the results of Project MATCH (2003). Of considerable importance in interpretation of positive "treatment" outcomes in Project MATCH was the fact that patients in the three treatment groups participated in numerous research interviews over the course of the study. This clouded the ability to distinguish the impact of treatment versus research contact on the outcomes observed.

Although treatment studies have typically followed patients for 6 months following discharge (McLellan et al., 1994), a longer follow-up period would add information about the short and long term predictors of substance use outcomes. It has been noted that in studies with short evaluation periods, dependence severity at baseline and treatment variables account for a larger proportion of the variance in outcomes (Alterman et al., 1997) compared to historical variables and posttreatment factors that have greater explanatory power in studies with longer evaluation periods

(Moos, Finney, & Cronkite, 1990). However, it has also been reported that short-term outcomes of alcohol and drug intake may be predictive of long-term outcomes, indicating that those who do well at 6 months are likely to be improved at later follow-up (Weisner, Ray, Mertens, Satre, and Moore, 2003; Bottlender & Soyka, 2005). Weisner et al. (2003) found that abstinence from drugs and alcohol at 6-month follow-up was a strong predictor of abstinence at 5 years. In their study, other positive factors influencing 5-year abstinence were alcohol dependence versus other drug dependencies, 12-step meeting attendance, female gender, specific social support for abstinence and readmission to treatment. Similarly, Bottlender & Soyka (2005) reported that patients who had improved during the course of treatment and completed treatment had less risk of relapse at 3-year follow-up.

A methodological issue related to external validity of the results is that psychiatric expertise was available on site at assessment and throughout treatment, which is not always the case in chemical dependency treatment programs. In the U.S., 50% of treatment facilities registered in the National Survey of Substance Abuse Treatment Services were found to offer dual diagnosis treatment, but even some of these programs did not offer supplementary services for mental, social, or health services often required by these patients (Mojtabai, 2004). A survey of the Veterans Administration addiction treatment programs in the U.S. reported that most had dedicated psychiatric, psychological, social work, and nursing staff, but 17% had no dedicated access to a psychiatrist, 20% had no social workers, and 26% did not have psychology services (Willenberg et al., 2004). In the current studies, having psychiatrists on staff as well as therapists with expertise in mental illness and addiction may have resulted in improved treatment outcomes and a lower dropout rate

for those with co-existing psychiatric disorders. Patients may also have sought treatment at the Addictions Unit rather than other treatment sites because of the availability of assessment and treatment for psychiatric problems, although the percentages of comorbid Axis I and Axis II disorders were not higher than in other community outpatient treatment samples. Multi-site trials comparing outcomes based on availability of psychiatric treatment would be useful in examining how availability of psychiatric treatment may influence rates of retention and substance use outcomes. Other facts to consider about generalizability of outcomes based on the current studies is that patients attending the Addictions Unit were mainly Caucasian, relatively well educated, English-speaking or bilingual (English and French), and primarily male.

Data reported on substance use outcomes were based on a combination of urine screen results, self-reports, and therapist notes from patient charts. Compliance with provision of urine screens during the treatment was below the treatment guidelines, but at follow-up assessment patients were asked to provide a urine screen and less than 1% refused this request. Due to the fact that urine screening has low sensitivity for alcohol, future research could be improved by adding a blood test or breath analysis for confirmation of self-reported alcohol intake. Other investigators have noted that, contrary to assumptions about deception, omission or poor recall, self-report on drug and alcohol intake is frequently corroborated by collaterals (Brown et al., 2002), urine testing (Weisner et al. 2003), and has been reported to have high levels of consistency over a 3-month period (Adair, Craddock, Miller & Turner, 1996).

Examination of the association between patient's choice of treatment, retention in treatment and substance use outcomes in would add valuable information about treatment outcomes. Although patients will not always be accurate in determining their needs for treatment, in a study examining predictors of deterioration among substance abusers, Moos et al. (2001) found that patients who had more severe drug, psychiatric, and social problems were aware of their dysfunctions, and were in agreement with therapists about needing treatment. Although choice of treatment condition is precluded in a randomized trial, additional information about whether or not patients had been randomized to preferred treatment, and inclusion of a group who refused randomization but accepted conventional treatment and follow-up would add useful information about whether or not patient choice had an effect on retention and substance use outcomes (Brown et al., 2002).

Despite the limitations described above, the studies included in the thesis had the strength of being conducted in a "real world" clinical setting, with a typical treatment-seeking population. The studies addressed pertinent questions about the nature of dropout and the implications for treatment effectiveness and the efficiency of services. An additional strength of the research was the introduction of a brief intervention into the culture of a clinic where the standard duration of therapy was 6 months. The design of the Brief Intervention, production of the treatment manual, and implementation of the study was conducted in close collaboration with the treating team, which may reduce barriers for the transfer of knowledge from research into clinical practice (Carroll & Rounsaville, 2003).

Further research on the effectiveness of a brief intervention in a larger scale study could address questions of format, number of sessions, and differential responses to treatment. However, conducting this study was a "first step" towards changing treatment services in the clinic. The National Forum on Health (Health Canada, 1997) made the point that although decisions ought to be made based on the "best" evidence, waiting for "perfect" evidence is not an excuse for ignoring available information or not taking action.

Chapter 8

Conclusion

Clinical Implications: The Impact of Findings on Planning Treatment Services and Health Care

For many clinicians, a continuum of care approach to treatment has an intuitive appeal, and also has the potential to increase cost-effectiveness by limiting the amount of time patients spend in relatively intensive and expensive rehabilitation programs (Ito & Donovan, 1986). All cases of addiction are not progressive; some people recover without specialized treatment; others have long periods of remission; while others do poorly and experience multiple relapses and negative consequences (McLellan, 2002). This perspective implies that the most useful paradigm is to consider substance dependence as a chronic, rather than an acute disorder. It has been pointed out that the medical community and the public do not expect a medication or treatment for chronic disorders, such as hypertension, diabetes, or asthma, to continue to be effective once the treatment has stopped (McLellan, 2002; McKay & Weiss, 2001). Nonetheless, this unrealistic expectation prevails in the evaluation of treatment services for addiction (McKay & Weiss, 2001). Clearly, multi-disciplinary treatment cannot provide a "cure", but when it takes into account the individual's characteristics and those of the social milieu, it may reduce the severity of the disorder, and in some cases, eliminate concomittant problems.

A shift away from thinking about "treatment effects" is necessary in order to appreciate the reality that many other factors including informal help, social resources, and life events play a longer lasting role in behaviour change than

treatment. Sustained improvement after treatment is not attributable to treatment alone, but is maintained by common factors associated with the process of change required for problem resolution (Moos, Finney, & Cronkite, 1990). This perspective is enlightening when examining treatment retention and substance use outcomes. It raises the question of how treatment can help patients find ways to develop a life context that is conducive to reduced substance use. This is a more realistic and practical expectation of what treatment can offer than the notion that treatment per se will resolve substance use disorders.

Empirical evidence suggests that there are several critical features needed to create an "autonomy supportive" environment (Ryan, 1982; Koestner, Ryan, Bernieri, & Holt, 1984; Williams, Grow, Freedman, Ryan, & Deci, 1996). These are: positive feedback concerning competence, absence of pressure to act in a certain way to achieve a particular outcome, acknowledgement and acceptance of the other's perspective, and provision of a meaningful rationale (Foote et al., 1999). Autonomous motivation has been shown to predict self-initiation and persistence of target behaviours in a range of diverse study populations (Deci & Ryan, 1985). Fitting with a perspective that treatment is not equated with "cure", the goals of treatment become promotion of beliefs and behaviours conducive to change and include the patient's acceptance of responsibility for dealing with substance dependence over time. Evaluation of within-treatment and external factors that influence motivation and self-efficacy and how these relate to treatment condition (CT versus BI) are questions that could be examined in future research.

From the patient's point of view, starting treatment with a brief intervention may be a positive and productive experience. Leaving a brief treatment with frank

discussion about progress, changes made, assessment of coping skills and resources for success in achieving goals is likely to be experienced in a very different way than "failing" or "dropping out" of treatment of longer duration. The "take home" message that the patient receives from a treatment experience may have an impact on the decision to accept additional treatment in the short or long term, and may even influence motivation and self-efficacy related to reducing drug and alcohol consumption.

It has been found that the duration of treatment and continuity of care are more strongly associated with positive outcomes than the intensity or amount of care (Ritsher, Moos, & Finney, 2002). A "stepped care" approach can improve accessibility of services as well as provide a treatment that may be more appealing to people with different needs (Breslin, 1997; Sobell & Sobell, 2002). People with less severe problems might seek help before more serious medical, legal, and social consequences are experienced if they know that treatment will not place major restrictions, demands, or negative labels on them (Marlatt, 1997). People with more severe problems could be provided with additional medical, social, and psychiatric services in order to address their needs. The availability of "brief interventions" within a range of treatment services has the potential to improve overall efficiency and make treatment accessible to a greater number of patients. Although dropout will not be eliminated through implementation of a brief intervention, shorter planned treatment durations would open up more spaces for new clients, and reduce waiting lists. Patients judged inappropriate for brief intervention at assessment or during the initial weeks of treatment would be offered more intensive treatment on an as-needed basis. In the Brief Intervention study, 35.7% of patients attending the Addictions Unit

were excluded from the trial due to the need for additional medical or psychiatric intervention. With an average of 450 admissions per year, approximately 282 (64.3%) patients could benefit from a brief intervention, opening treatment services to patients on the waiting list more rapidly. In order to provide the most efficient treatment delivery, the effectiveness of a group format for brief intervention would also need to be evaluated. As previously stated, more research is needed to determine the effectiveness of brief intervention across a wider range of patients before this service is implemented.

The implications of the above findings are relevant to the recommendations from the Commission on the Future of Health Care in Canada (Romanow, 2002). This report stressed the need to remove obstacles that prevent the optimal use of primary care. These obstacles included: the focus on hospitalization, increased specialization among physicians, fragmentation of services, the public's lack of health information, the limited control of patients over their own care, and marginal prevention and health promotion. How can a specialized service for the treatment of substance dependence play a role in improving utilization of primary care services? The answer lies in a long-range perspective of change in the health care system. Changes in attitudes and beliefs are required to achieve the goal of more efficient use of primary care in the treatment for substance dependence.

Both the public and health professionals alike have been accustomed to equating the "best" treatment with specialists, and with hospitals and University medical centres providing the latest technological advances in health care. In Canada, the number of general practitioners has decreased since 1993, and the number of specialists has increased to an all-time high (Romanow, 2002). It is a fact of life that

rapid technological advances in medicine and health care require specialized expertise, but there may be many aspects of health care that can be provided by knowledgeable, consistent, and available generalists in primary care. This may seem contrary to what is proposed in this thesis, which is the inclusion of a brief intervention into a specialized substance dependence treatment program. However, change progresses in steps over time, and in order to change beliefs and attitudes about health care and provision of quality services, empirical support for new treatment interventions is a necessary first step.

Since there is a shortage of general practitioners and nurses in primary health care at the present time, it is an unrealistic expectation that these overtaxed health care providers will have the time, patience, and expertise to begin initiatives to evaluate and implant additional services for substance dependence into their busy practices (Booth et al., 2001). Therefore, specialists with expertise in addiction need to lead the way in order to develop interventions and training in the field that will eventually be transplanted into primary care settings. A study of technology transfer within the field of addiction services found that clinicians given more credibility and considered as "opinion leaders" were those with relevant professional credentials, more postgraduate education, years of experience in mental health treatment, and greater knowledge of the dynamics of treatment and co-occurring disorders (Moore, et al., 2004). The study suggested that these professionals could be important for the transfer of knowledge from research into practice in community treatment settings. Therefore, the first step is introduction of change within the system of addiction treatment, the use of brief intervention as a sanctioned and effective treatment, followed by transfer of knowledge into primary health care settings. The wider

availability of brief interventions in primary health care may eventually make treatment available and accessible to a large number of people. For the successful transfer of empirically supported treatments into primary care, evidence of who will benefit from the treatment, who will need referral to additional or specialized treatment, co-ordination of services, and availability for consultation must be considered (Broner, Franczak, Dye, & McAllister, 2001; Iowa Practice Improvement Collaborative, 2003). In practice, effective treatments such as brief intervention for substance dependence that have been developed and evaluated by clinician specialists can be introduced to physicians, nurses, social workers, and psychologists in primary health care through on-site training in various treatment milieus.

Some progress in the introduction of brief counselling for alcohol abuse has been made in Quebec with the initiation of education and services of Educalcool, a non-profit agency comprised of members of the alcoholic beverage industry and concerned individuals with a goal of promoting responsible drinking. Educational materials and short-term counselling about moderation in drinking provided by front line health workers are available at some CLSC's throughout the province. Combined research and communication with primary care health professionals will continue to improve treatment, co-ordination of services, and reduce duplication, thereby increasing efficiency of services for substance dependence.

A phenomenon that is occurring throughout the Canadian health care system is the emergence of private health care. The concern of Federal policy makers about privatization is that the credibility and effectiveness of the public system may be eroded (Romanow, 2002). Private treatment has been available for the treatment for substance dependence for many years, potentially leading to fragmentation, a lack of

co-ordination and quality control, as well as the possibility of reduced governmental funding for public services for addiction. Delivery of appropriate, efficient, and effective treatment for substance dependence within the public sector will reduce fragmentation of services, increase the public's awareness about methods to reduce substance abuse, and help people assume more responsibility for their own care. These goals can only be reached if a seamless continuum of co-ordinated care involving primary and specialized services in the health care system is provided for the treatment of substance dependence.

A possible response of treatment providers and administrators to deal with the phenomenon of people leaving substance abuse treatment early is to place the onus on the patient and adopt the attitude that he or she will return "when ready", requiring no change in treatment services. Another response to the high percentage of people leaving treatment early involves finding out more about who leaves treatment early and why, as well as comparing changes in substance use for those who are retained versus those who leave, and considering ways to make practical changes in existing treatment programs. This latter response adopts an interactional view of dropout, examining the fit between patients' characteristics and the treatment service and formed the basis of the research conducted in the thesis.

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Table 4: Substance Use Variables Stratified by Early Dropout

	Early Dropouts N = 109	Retained > 6 weeks N = 302
Number of years of problem use of primary drug	9.3 (0.77)	11.1 (0.51)
Primary drug of abuse		
Alcohol alone	27.5%	34.4%
Drugs	30.3%	25.8%
Alcohol + Drugs	42.2%	39.7%
Number of days of primary drug intake (past month)	14.9 (1.12)	15.0 (0.69)
Previous treatment for substance abuse	48.1%	50.7%
ASI Alcohol Composite Severity score	0.36 (0.03)	0.40 (0.02)
ASI Drug Composite Severity score	0.15 (0.01)	0.15 (0.01)
ASI Medical Composite Severity score	0.16 (0.03)	0.21 (0.02)
Secondary drug of abuse	53.2%	42.7%