The Gemini Project: An evaluation of a treatment program for persons with serious mental illness and substance misuse

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THE GEMINI PROJECT: AN EVALUATION OF A TREATMENT PROGRAM FOR PERSONS WITH SERIOUS MENTAL ILLNESS AND SUBSTANCE MISUSE

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Contents

Abstract

Persons with a dual problem of serious mental illness and substance use disorder are particularly vulnerable and have complex service needs. At present comorbid mental and substance use disorders are less than optimally recognised and managed. The literature indicates that persons with dual disorders are failing to access treatment services or are being poorly treated by the current systems.

The Inner City Mental Health Service (ICMHS) attempted to address this problem by establishing an innovative treatment program targeting clients with a serious mental illness who were case managed by the service and had substantial substance misuse over the previous six months. The project, funded by the Commonwealth Government, employed 3.5 full-time equivalent clinical staff for a period of two years. The team was called the Gemini Team. The objectives of the project were to develop an effective treatment program, to develop links between mental health, drug and alcohol, and non-government organisation treatment services, and to provide training for staff working in these areas.

Eighty-three of the 149 clients referred by case managers of the ICMHS were assessed by the Gemini Team. Sixty-seven clients received treatment and 37 remained with the program to receive follow-up assessment after twelve months. Measures of alcohol and drug use and their associated effects were obtained using a revised version of the Opiate Treatment Index and the Nursing Modification version of the Brief Psychiatric Rating Scale (BPRS[NM]). Clients were measured on drug taking, social functioning, HIV risk-taking behaviour, and psychiatric symptoms before and after intervention.

After twelve months of intervention clients showed only moderate change. There was a trend, which was not statistically significant, towards reduced substance use and improvements in social functioning and psychiatric symptomatology. Satisfactory gains were made in developing links between drug and alcohol and mental health services and, through training, raising the clinicians' awareness of dual diagnosis issues.

Despite only minor improvements in the outcome measures the project succeeded in linking drug and alcohol and mental health services and providing training to staff. Since the completion of the Gemini project the Inner City Mental Health Service has not had funding to specifically target the drug and alcohol issues of clients with serious mental illness. It is unlikely that the emphasis on dual diagnosis and the importance of addressing these issues concurrently will be sustained in the absence of such funding.

Introduction

In the neat world of clinical research a confident picture is emerging as to which treatments are effective for which individual mental disorders (American Psychiatric Association, 1994; World Health Organisation, 1991). This research on the whole is based on tightly defined homogenous samples of patients. In contrast, recent epidemiological studies including the Epidemiologic Catchment Area (ECA) and, more recently, the National Comorbidity Survey of the United States (NCS) have once again highlighted a well-known but poorly addressed problem: That alcohol or drug problems and mental disorders can, and often, co-exist. Such comorbidity complicates both clinical practice and research. In clinical research those individuals with co-occurring disorders are often excluded from treatment trials leaving clinical practice with a dearth of relevant information on which to base treatment.

Comorbidity amongst persons seeking treatment for either drug and alcohol or mental disorders has long been recognised. Comorbidity in the general population has recently been highlighted by the new epidemiological data from studies such as the NCS. In contrast to the developing literature on prevalence, there is an ill-defined literature regarding the implications of comorbidity on service provision. Very few studies have systematically and empirically reviewed treatment options although there is an increasing number of discussion papers (e.g., Gournay, Sandford, Johnson, & Thornicroft, 1997; Kavanagh, 1995; Kessler, 1995; Mueser, Bellack, & Blanchard, 1992; Mueser, Drake, & Miles, 1997; Ries, 1992; Smith & Hucker, 1994).

Despite the common co-occurrence of drug and alcohol and mental disorders it is clear that service delivery systems do not adequately meet the needs of this group. The problems of providing care to this group are shared by many countries. Consensus and discussion papers from countries with health service structures as diverse as the United Kingdom, the United States of America, The Netherlands, and Italy all indicate that persons with co-occurring drug and alcohol and mental disorders are failing to access treatment or are being poorly treated by the current systems.

In this report we review the epidemiological findings on the rate of co-occurrence of mental disorders and drug and alcohol problems for clinical populations and the general population. We then consider the service delivery implications and the treatment outcome literature and outline one service's response to the problem of treating persons with serious mental illness and substance misuse.

Epidemiology

Co-Occurrence of drug and alcohol and mental disorders in the general population
Reports from the U.S. National Comorbidity Survey (NCS) indicate that 28.8% of the general population qualified for a current (past 12 months) alcohol, drug or mental disorder diagnosis. Of these, 20.5% had a mental disorder, 4.7% had an alcohol or drug disorder, and 3.5% had both a mental disorder and an alcohol or drug disorder (Room, 1997).

The British Psychiatric Morbidity Survey reported similar findings to the NCS studies with moderate rates of alcohol and drug dependence among persons with other mental disorders (Gill, Meltzer, Hinds, & Petticrew, 1996).

The population rates of comorbidity are obviously substantial. As illustrated in Table 1 (Kessler, 1995) the rates are clearly elevated in those with schizophrenia; with odds ratios of 4.6 and 4.7 for alcohol or drug comorbidity, respectively. Evidence from the U.S. Epidemiologic Catchment Area (ECA) Study indicates that people with schizophrenia or bipolar disorder were four and five times more likely than the general population, respectively, to have had a substance use disorder at some stage in their lifetime (Regier et al., 1990).

The implications for treatment services for dual diagnosis were also highlighted in the ECA data (Regier et al., 1990). Persons with mental disorders seen in specialty treatment settings were twice as likely to have a substance abuse disorder (19.8%) as those who did not seek treatment (10.6%).

Table 1
Six month comorbidity of Epidemiological Catchment Area Study (ECA) (DSM-III) and National Comorbidity Study (NCS) (DSM-IIIR) disorders

	Substance Use		
DSM-III & DSM-IIIR Disorders	Study	Alcohol	Drug
Affective Disorders	ECA	1.7-3.8	2.0-3.4
	NCS	1.8-5.6	3.0-5.7
Anxiety Disorders	ECA	1.7-4.6	1.0-3.4
	NCS	1.4-2.7	2.9-5.0
Schizophreniform Disorders	ECA	4.6	4.7
	NCS[4]	-	-

Coefficients in the table are zero-order odds-ratios. ORs greater than 1.0 means that there is a positive association between the various pairs of disorders (See Kessler, 1995).

[4] NCS omitted for Schizophreniform disorders as the number of respondents was too small for stable estimation of odds-ratio.

Co-occurrence of drug and alcohol and mental disorders in clinical populations

It is widely accepted that substance abusing and psychiatric patient samples frequently report the co-occurrence of both disorders (Ross, Glaser, & Germanson, 1988). Such comorbidity has consistently been found to be more prevalent in treatment than non-treatment samples (e.g., Helzer & Pryzbeck, 1988; Kessler et at., 1996; Ross et al., 1988). For people with a serious mental illness the risk of developing a substance use disorder is of particular importance as they are especially vulnerable compared to people with other psychiatric disorders (Mueser et al., 1997).

To enable a better understanding of the co-occurrence of serious mental illness and substance abuse a review based on community mental health samples is summarised in Table 2. As shown, every study summarised found a higher rate of abuse or dependence on alcohol among community mental health samples than among the general population. The prevalence estimates from these studies indicate that between 18.1 and 25.3% of community mental health service clients suffer from alcohol abuse or dependence. The table also gives the comparison data from various general population household samples taken from the ECA (Regier et al., 1990) and NCS studies (Kessler, 1994). Clearly, community mental health samples have markedly higher rates of substance abuse or dependence than the general community.

Table 3 provides a brief overview of the prevalence of substance abuse in clinical studies of dually diagnosed groups. As expected, the prevalence of substance abuse for those receiving treatment specifically for their comorbid mental illness and substance abuse greatly exceeds that found in both general population and community mental health samples.

Table 2 *Prevalence of mental illness and current substance misuse in Community Mental Health populations compared with the United States population National Comorbidity Study (NCS) and Epidemiological Catchment Area Study (ECA)*

Community Mental Health Samples							
Method & Study	**Time**	**N**	**Males**	**Diagnosis**	**Alcohol**	**Any Drugs**	**Site**
Fowler et al. (in press) SCID-R	6 months	194	73%	100% Schizophrenia	59.3% some use 2.1% abuse 16.0% dependence	*Non-prescribed* 3.6% abuse 9.3% dependence *Prescribed* 2.1% abuse 3.1% dependence	Regional Australia Hunter Area Health Service Outpatients
Osher, Drake, Noordsy, Teague, Hurlbut, Biesanz & Beaydett (1994) Concensus diagnoses	12 months	75	48%	89.3% Schizophrenia 10.7% schizoaffective disorder	12.0% abuse 13.3% dependence	not reported	CMHC - rural New Hampshire - USA
Bartels, Drake & McHugo (1992) Case Manager 5-point rating scale	6 months 6 months	133 75	59% 48%	100% Schizophrenia/ schizoaffective disorder 100% Schizophrenia/ schizoaffective disorder	24% abuse or dependence 24% abuse or dependence	not reported	Urban outpatients Mass. Rural outpatients New England
Drake, Osher & Wallach (1989) C/Mgr 5-point rating scale	6 months	115	59%	100% Schizophrenia	23% use 22% abuse or dependence	*Street drugs* 34% any use/ abuse	Massachusetts Mobile Community Team Outpatients
Drake & Wallach (1989)	6 months	187	54%	61% Schizophrenia	22% mild use	*Street drugs*	Mobile

Community Mental Health Samples							
Method & Study	**Time**	**N**	**Males**	**Diagnosis**	**Alcohol**	**Any Drugs**	**Site**
Case Manager 5-point rating scale[5]				10% schizoaffective disorder 20% bipolar disorder 9% personality disorder	7% abuse 18% dependence	14% mild use 7% abuse 11% dependence	community-based ambulatory services team-inner city USA
Test, Wallisch, Allness & Ripp (1989) 5-point scale: Case Manager ratings	6 months	72	64%	100% Schizophrenia or related disorders	45.8% significant use	significant use 30.5% *cannabis* 5.6% *other street drugs*	Training in Community Living program - USA
Range of Abuse or Dependence					18.1%-25.3% abuse/dependence		
NCS (Warner, Kessler, Hughes, Anthony & Nelson, 1995) CIDI	12 months	8,098 (82.4% response)		100% general population	not reported	15.4% use 1.8% dependence	NCS USA
NCS (Kessler et al., 1996) CIDI	12 months	5,877		100% general population with affective, anxiety, addictive, conduct, or adult antisocial behaviour	14.7% abuse/dependence alcohol/drugs 3.5% abuse 1.1% abuse 8.3% dependence 4.0% dependence		NCS USA
NCS (Kendler, Gallagher, Abelson & Kessler (1996) CIDI	lifetime	5,877		100% general nonaffective psychosis	43.2% dependence 57.0% abuse or dependence	37.7% dependence 44.8% abuse or dependence	NCS USA
ECA (Regier et al., (1990) DIS	6 months	20,291		100% any mental (not addictive) disorder and not seen in treatment	10.6% any addictive disorder 8.1% any alcohol disorder	4.2% any other drug disorder	ECA USA

[5] Bartels, Drake & Wallach (1995) followed-up 148 of this (Drake & Wallach's, 1989) sample after 7 years and reported no significant differences in prevalence.

NB. Abuse and dependence correspond with Diagnostic and Statistical Manual of Mental Disorders, Third Edition, revised (DSM-III-R) substance abuse criteria. Test et al.'s (1989) significant use is defined as substance use several times a week or more.

Table 3
Current prevalence of mental illness and substance misuse in dually diagnosed clinical trial populations

Clinical Trials							
Method & Study	**Time**	**N**	**Males**	**Diagnosis**	**Alcohol**	**Any Drugs**	**Site**
Jerrell & Ridgely (1995) C-DIS-R	6 months (baseline)	147	not reported	100% Axis 1 DSM-III-R or previous psychiatric treatment	40% use	18.8% use	Outpatient treatment trial - USA
Clark (1994) SCID-P	30 days	119	not reported	53% schizophrenia 24% bipolar disorder 23% schizoaffective disorder	82% abuse	39% *marijuana*	New Hampshire Community-based treatment program
Lehman, Herron, Schwartz & Myers (1993) SCID-P	30 days	54	74%	23% bipolar disorders 9% major depression 68% schizophrenia/psychoses	53.7% substance use disorder		Inner city CMHC - USA

Serious Mental Illness and Substance Abuse

Treatment Implications

A simple listing of prevalence and comorbidity rates are not sufficient to indicate a group with specific needs. For people with severe mental illnesses, substance use disorders are particularly problematic as they are generally directly associated with a range of negative outcomes. Compared with people who suffer from mental illness alone, those with concurrent substance use show increased levels of medication non-compliance, psychosocial problems, depression, suicidal behaviour, rehospitalisation, homelessness, have poorer mental health and place a higher burden on their families (see Bartels et al., 1992; Clark, 1994; Drake et al., 1989; Drake & Wallach, 1989; Osher et al., 1994; Pristach & Smith, 1990). Persons with both disorders have also been recognised as being more difficult to treat than those with mental disorders alone (Drake, Mueser, Clark, & Wallach, 1996; Lehman et al., 1993). The challenge of the dually diagnosed group must be addressed by treatment services if they are to provide effective services.

Assessment Difficulties

At present, comorbid mental and substance use disorders may be less than optimally managed by existing mental health services or substance use services. Well documented deficiencies in assessment by treatment services are compounded in the treatment of those with a dual diagnosis. Some common difficulties are that clinicians may fail to obtain a full history of substance use in people with a mental illness. Alternatively, people with a mental illness may deny, distort, or minimise their self-reported use of substances, particularly illicit drug use (see Byrant, Rounsaville, Spitzer, & Williams, 1992; Drake & Mercer-McFadden, 1995; Mueser et al., 1997).
Fowler et al. (in press, p. 8) in a study of substance abuse by people with schizophrenia in Newcastle, Australia commented that:

> "..., although there was reasonable agreement between case managers' assessments and the research diagnoses, this did not reach the levels found in other studies (Drake et al., 1990; Carey et al., 1996), possibly because in the current study the case managers were not trained. Thus, efforts to train case managers and to heighten their awareness of substance use problems in their schizophrenic patients may be timely."

Amount of Substance Abuse

The failure to treat mental health problems in persons with substance abuse disorders predicts poor outcome (Helzer & Pryzbeck, 1988). Drake et al.'s (1990) study on alcohol use indicated that, as a group, people with schizophrenia were particularly vulnerable to the psychiatric and social complications of drinking. The authors suggest almost any alcohol consumption at all by people with schizophrenia should be identified as problem drinking. Consequently, applying standard definitions and diagnostic criteria to those with severe mental illness may substantially underestimate the problem (Smith & Hucker, 1994).

Reasons for Use

A number of authors have assessed and reviewed the reasons for substance use (see Smith & Hucker, 1994 for review). A commonly cited reason for substance use among people with a mental illness is that it is used for self-medication purposes such as to counteract negative symptoms or side-effects (e.g., Dixon, Haas, Weiden, Sweeney, & Frances, 1991). An alternative hypothesis is that people with a mental illness use substances for essentially the same reasons as people in the general population. That is, to enjoy the effects of the intoxication, escape from emotional distress or for social reasons (e.g., Fowler et al., in press). The latter explanation is consistent with the findings of Test and colleagues in the United States (Test et al., 1989).

Type of Drug

Findings from clinical studies and population surveys suggest that alcohol and cannabis are the most common substances of abuse for people with a serious mental illness (e.g., Cuffel, Heithoff, & Lawson, 1993; Drake et al., 1990; Lehman, Myers, Dickson, & Johnson, 1994; Menezes et al., 1996). A recent Australian study found similar results in a sample of patients with schizophrenia attending a community mental health service (Fowler et al., in press). Aside from tobacco; alcohol, cannabis and amphetamines were the most commonly abused substances. Data from the NCS study in the United States suggests the same pattern of drug preference exists in the general population, irrespective of mental illness (Anthony, Warner, & Kessler, 1994).

Impact of Comorbidity on Use of Psychiatric Services

A study conducted in the United Kingdom by Menezes et al. (1996) found slight differences in service use between those with serious mental illness and substance abuse and those with serious mental illness alone. The average number of admissions to psychiatric hospital was similar for both groups although those who abused substances attended the psychiatric emergency service 1.3 times as often, and spent 1.8 times as many days in hospital, as those with mental illness alone.

Comorbidity has also been shown to impact upon treatment compliance. Non-compliance with medication occurs in up to 50% of patients with schizophrenia. If the patient is also using illicit drugs or alcohol the rates of non-compliance rates are greatly increased (Bebbington, 1995).

Despite the numerous studies conducted in the United States that have linked substance use to negative outcomes (e.g., Drake et al., 1989; Drake & Wallach, 1989; Drake et al., 1990; Helzer & Pryzbeck, 1988; Pristach & Smith, 1990; Safer, 1987), Fowler et al.'s (in press) recent Australian study found little evidence that substance abuse adversely affected the course of schizophrenia. This disparity may be explained by the difference in community setting between the United States and Australia. As Fowler and colleagues point out, Australia has a policy of providing the chronically ill with free hospital and community care and financial assistance through public housing and pensions. It is likely that these factors may help to improve the prognosis for people with a chronic illness such as schizophrenia.

Models of Management

There is a new interest internationally in developing effective models to treat persons

with substance abuse and serious mental illness (e.g., Gournay et al., 1997; Hall & Farrell, 1997). This initiative has come from both the mental health and drug and alcohol fields.

The treatment response to drug and alcohol and mental disorders in many developed countries has been dominated by parallel systems. That is, drug and alcohol disorders have been treated by one co-ordinated, funded, and planned service whilst mental disorders have been treated in parallel by a separate, unconnected service. A wide range of problems have been noted with using this method to treat comorbid substance use and psychiatric disorders (Minkoff & Drake 1991; Ridgely, Goldman, & Willenbring, 1990). The most outstanding problem is the wealth of evidence documenting that the traditional methods for treating substance use do not work for clients with psychiatric disorders (McLellan, Luborsky, Woody, O'Brien, & Druley, 1983; Rounsaville, Dolinsky, Babor, & Meyer, 1987; Woody, McLellan, & O'Brien, 1990). It is likely that this lack of success has resulted from the mental health and substance use services offering only separate, parallel treatment programs (Ridgely et al., 1990).

To overcome the problems associated with parallel treatment systems, services for people with serious mentally illness have begun to integrate substance abuse and mental health treatment into comprehensive programs (e.g., Carey 1996; Drake, Bartels, Teague, Noordsy, & Clark, 1993; Minkoff, 1989). A range of integrated treatment models have been developed which all abide by the following principles:

1. The same individual, team, or service, provides both mental health and substance abuse treatments simultaneously.

2. Behavioural strategies are utilised to help clients resist social pressures and urges to use substances.

3. Close involvement is maintained with the patient's family.

4. Treatment is approached in stages to ensure optimal timing of clinical interventions (Mueser et al., 1997).

Research on Integrated Treatment

The difficulties associated with undertaking controlled research with people with chronic mental illness are reflected in the treatment studies. Most studies that have attempted to evaluate treatment programs have suffered the limitations of having small sample sizes, brief follow-up periods and poorly standardised measurement instruments (Mueser et al., 1997).

Probably the most extensive development of services for people with co-existing severe mental disorder and substance abuse disorder has occurred at the New Hampshire-Dartmouth Psychiatric Research Centre in the United States (e.g., Bartels et al., 1992; Bartels, Drake, & Wallach, 1995; Drake, Bartels, Teague, Noordsy, & Clark, 1993; Drake & Mercer-McFadden, 1995; Drake, Mueser, Clark, & Wallach, 1996; Drake & Noordsy, 1994; Drake et al., 1990; Drake et al., 1989; Drake & Wallach, 1989; McHugo, Drake, Burton, & Ackerson, 1995; Mueser et al., 1997; Noordsy, Schwab, Fox, & Drake,

1996; Osher et al., 1994). The researchers involved in service development have emphasised the importance of approaching both disorders in an integrated way. This group have recently published a report on a long-term study of substance abuse and dependence among severely mentally ill patients (Bartels et al., 1995). They managed to follow-up nearly 80% of a cohort of 187 for seven years and found that the prevalence of substance abuse disorder changed little over that time. This finding reflects the importance of investigating a client's actual use of substances rather than their diagnosis per se.

Jerrell and Ridgely (1995) examined the effectiveness of integrated treatment models for treating people with severe mental illness and secondary substance abuse disorders. The 147 participants all had previous psychiatric treatment, and problems with at least two out of five aspects of work, living skills, social functioning and behaviour. At 18-month follow-up, participants had achieved significant improvements in the areas of work productivity, independent living, immediate and extended social contacts. A significant decrease was also evident for observable psychiatric symptoms. Overall satisfaction with life and social adjustment did not significantly improve, and with the exception of mania, self-reported psychiatric and substance abuse symptoms did not significantly decline. The only significant differences to service utilisation were that the use of emergency services declined as the use of medication and outpatient care services increased. Overall, it seems that clients became more satisfied with their lives, but showed little change in problems directly related to their mental illness or substance disorder. This form of outcome is common in treatment studies (Marks, 1992).

Considered together, the few studies reporting outcomes for dually diagnosed groups primarily show reductions in hospitalisation and only slight changes in psychosocial functioning and symptoms (Jerrell & Ridgely, 1995).

In an effort to understand which components of treatment are effective, Drake and colleagues (1993) reviewed demonstration programs and clinical research in this area. They identified several elements of dual-diagnosis treatment that are common to successful programs. These include:

> "an assertive style of engagement, techniques of close monitoring, integration of mental health and substance abuse treatments, comprehensive services, supportive living environments, flexibility and specialisation of clinicians, stage-wise treatment, a long-term perspective, and optimism" (Drake et al., 1993, p. 610).

Despite the impact the dually diagnosed population have on service delivery, progress with respect to treatment and training has been slow (Minkoff, 1989). A recent comment pertaining to the development and treatment for substance abuse in chronic mentally ill young adults was that it is "in its infancy, characterised more by trial and error than by implementation of established treatment methods" (Ridgely, Osher, & Talbott, 1987 cited in Minkoff, 1989, p. 1031). Currently no single method for treating any combination of concurrent drug and alcohol and mental disorders has been proven (Room, 1997).

The empirical literature on the effects of treating co-occurring addiction and mental disorders is relatively sparse and often involves anecdotal, theoretical, or descriptive reports. The interpretation of most empirical studies has also been complicated by the by the heterogeneity of diagnoses (Weiss, Greenfield, & Najavits, 1995). At present, judgements about service planning or organisation rely more upon judgement than research evidence (Room, 1997).

Conclusions from the Literature

1) persons with a dual problem of serious mental illness and substance use disorders are a particularly vulnerable subgroup with complex service needs.

2) at present comorbid mental and substance use disorders are less than optimally recognised and managed.

3) the evidence for effective treatment options for this group are less than encouraging.

The Gemini Project

Background

The recent Burdekin inquiry (Human Rights & Equal Opportunity Commission, 1993a; 1993b) established that very few services were available to effectively treat individuals effected by both mental illness and substance use disorders in Australia. There was agreement that specialist mental health services need to improve their recognition and treatment of comorbid substance use among their patients and that drug and alcohol services should screen for mental health complications. Notwithstanding the fact that those with a dual diagnosis tend to be unmotivated, non-compliant with treatment and difficult to engage in treatment (Drake et al., 1993).

Following these findings, in 1995, the Inner City Mental Health Service (ICMHS), a facility of the then Eastern Suburbs Area Health Service, decided to address the needs of those with a dual diagnosis of serious mental illness and substance abuse in the inner city area. The following section outlines the Gemini project in the context of the ICMHS.

The Gemini project was a two year Commonwealth Government funded project which established an innovative treatment program for people with a serious mental illness and concurrent substance misuse. Prior to its completion in February 1997, the team comprised 3.5 full-time equivalent clinical staff: Three registered general/psychiatric nurses (including the team leader and a half-time nurse) and a drug and alcohol worker. The project ran in conjunction with the Inner City's existing case management services and targeted case managed clients with a serious mental illness and substantial substance misuse over the previous six months. The project's fundamental aims were to provide individual treatment, increase treatment access, and raise clinicians' awareness of dual diagnosis issues. The specific objectives and treatment hypotheses are outlined below.

Objectives

1. Develop a relevant and effective treatment program for substance abuse to be run in addition to existing case management services.

   ### Treatment Hypotheses

   Following treatment by the Gemini Team, persons with serious mental illness would demonstrate:

   a) reduced substance misuse;
   b) improved social functioning;
   c) reduced HIV risk-taking behaviour, and
   d) reduced psychiatric symptoms,

   compared to before treatment.

2. Develop links between mental health and drug and alcohol treatment services and non-government organisations.

3. Provide training for mental health and drug and alcohol workers in the treatment of persons with serious mental illness and concurrent substance misuse.

Process of Gemini Project

The services provided by the Gemini Team were based on the findings that:

1. persons with a dual problem of serious mental illness and substance use disorders are a particularly vulnerable subgroup with complex service needs.

2. few clinicians in health services are trained in both mental health and substance misuse treatment (Human Rights & Equal Opportunity Commission, 1993a; 1993b).

The services provided were based on the principles of harm minimisation as:

1. discussions with existing service providers strongly indicated that abstinence would not be a realistic goal for many of this client group.

2. harm minimisation is the underlying principle of mainstream drug and alcohol services.

The task of the project staff was to integrate the drug and alcohol and mental health systems. Recent research indicates that a staff/client ratio of 1:10 would have been required to case manage the target group of clients (Andrews & Teesson, 1994). If stand alone treatment was implemented, the 3.5 full-time equivalent staff on the Gemini Team could only have case managed a maximum of 35 clients at any point in time. Implementing such a service for the two years' duration of the project would have effected no long term changes to treatment access for this client group. Consequently, the Gemini Team did not undertake case management. They followed a linkage model.

For effective implementation of the linkage model it was assumed that the following framework was in place.

1. The Gemini Team would work within existing the resources of the then Eastern Sydney Area Health Service (ESAHS).

2. The drug and alcohol and mental health services within ESAHS were adequate to meet the needs of the client group.

3. The course of serious mental illness is often chronic and clients known to the system would be case managed by mental health services. Drug and alcohol co-case management would be required on a relapse, or crisis basis.

4. At a management level, services would be prepared to acknowledge and review any policies that were problematic for this client group, particularly those relating to treatment access.

5. Clinical staff would support the project to the best of their ability and be prepared to be multi-skilled in the joint areas of drug and alcohol and mental health.

6. Staff of non-government organisations would access education and training offered by the Gemini Team.

Strategies Implemented

The following strategies were implemented by the Gemini service in order to meet their objectives.

Objective 1: Develop a relevant and effective treatment program for substance abuse to be run in addition to existing case management services.

- Referral protocols to the Gemini Project were drafted and forms designed and distributed to mental health teams.

- Priority access positions were negotiated at the public methadone units in ESAHS.

- A modified version of the Opiate Treatment Index (OTI) was designed for use as a drug and alcohol assessment tool (Darke, Ward, Hall, Heather, & Wodak, 1991a; Darke, Hall, Wodak, Heather, & Ward, 1992).

- To improve the identification of drug and alcohol issues a mini drug and alcohol assessment tool was developed for case managers to complete for all new clients (Appendix A). The tool was a modified version of the initial assessment interview and was developed with the assistance of the authors of the Opiate Treatment Index at the National Drug and Alcohol Research Centre. It was anticipated that the implementation of the mini drug and alcohol assessment tool would:

i) Result in clients being referred at earlier stages of their drinking/drug using careers when treatment was more likely to succeed.

ii) Raise and maintain clinicians' awareness of clients' drug and alcohol misuse.

iii) Bypass individual resistance to the project as substance misusing clients would automatically be referred to the Gemini project upon completion of the mini assessment. Current drug use by ICMHS clients as reported in the mini assessments is presented in Appendix B.

- A treatment program was developed based on four phases of treatment:

  i) Engagement with the service.

  ii) Provision of a comprehensive assessment of alcohol, drug and mental health problems.

  iii) Provision of integrated treatment which included a core set of mental health and substance misuse interventions.

  iv) Provision/co-ordination of relapse prevention or other after care intervention.

- Service plans were developed to follow-up clients who dropped out of treatment or for whom the treatment appeared unsuccessful. Attempts were then made to initiate relapse prevention strategies and re-engage the clients in treatment.

Objective 2: Develop links between mental health and drug and alcohol treatment services and non-government organisations.

- A management committee was formed with senior representatives of drug and alcohol, mental health, and relevant non-government organisation services (see Appendix C for management committee). This was the first time that heads of these departments had formally met to improve access to treatment.

- Current ICMHS policies that impeded access for the target client group were reviewed by the project team in conjunction with senior mental health program staff.

- The Gemini team regularly attended drug and alcohol and mental health meetings to ensure that comorbidity issues were routinely raised and to resolve any issues that arose. The meetings included:

  i) daily ICMHS intake review meetings.

  ii) twice weekly case allocation meetings at the drug and alcohol counselling service.

  iii) twice weekly ICMHS case review meetings.

  iv) monthly meetings with ICMHS's Early Psychosis Onset Project (EPOCH).

  v) regular ongoing negotiations with relevant service providers regarding treatment access issues.

  vi) quarterly inter-agency non-government organisation meetings.

- Department heads from ICMHS, St. Vincent's Hospital and the Gemini Team met to review the profile of the target group of clients and to look at streamlining the intake process to increase client's access to treatment.

Objective 3: Provide training to mental health and drug and alcohol workers in the treatment of persons with serious mental illness and concurrent substance misuse.

- An educational needs assessment was conducted with staff from mental health, drug and alcohol and relevant non-government organisation services.

- Seminars outlining the services offered by the Gemini Team were provided for all relevant clinical service providers.
- Comprehensive training packages were made available to all staff and an eight session inservice program was conducted at locations accessible to all staff (see Appendix D for timetable). The inservice topics were selected on the basis of the educational needs assessment and incorporated various aspects relating to mental health and drug and alcohol use.

Inner City Mental Health Service[6]

The Gemini Project was attached to the ICMHS of Sydney, which covers an area of approximately 16 square kilometres and has a population of 71620 (Australian Bureau of Statistics, 1994). ICMHS provides a comprehensive 24 hour mental health service to one of the most difficult and deprived areas in Australia. There are over 800 beds in refuges for the homeless, and 26% of the men and 30% of the women residing in these refuges meet criteria for a serious mental illness, usually schizophrenia (Teesson & Buhrich, 1990; Virgona, Buhrich, & Teesson, 1993). The area is characterised by cheap rooming houses, squats, the homeless, skid-row alcoholics, and the sex and drug industry all concentrated in one small area. The area has the highest concentration of people with AIDS in Australia. It is indistinguishable from many other inner city areas in large cities throughout the world.

Table 4 gives the demographic characteristics of the inner city area from the 1991 census compared to the state of NSW. The inner city area has a greater number of persons who were not born in Australia and a substantially smaller number than across the state of persons who were in the same residence five years ago. The inner city also has substantial numbers of single persons households, and rented dwellings. These characteristics reflect the unstable nature of the population and the lack of traditional social supports for residents.

[6] Modified from Teesson (1995).

Table 4
Demographic characteristics of catchment area of ICMHS compared to NSW

Characteristic	ICMHS	NSW
Population 1986	65,758	
Population 1991	71,620	5,731,906
Adult Population (15 years+)		
	% in ICMHS	% in NSW
Born in Australia	47	75
Speak language other than English at home	19	17
Aboriginal or Torres Strait	0.6	1.2
Unemployed (15 years+)	7	7
Not in labor force	28	37
Not qualified	44	59
Same residence as 5 years ago	34	56
Households renting	57	25
Single person households	46	7
Never married	19	29

Notes: Demographic data are based on 1991 Australian Bureau of Statistics Census of Population and Housing.

Development of Mental Health Services in the Inner City

Prior to 1988, the mental health services in the inner city area consisted of a 36 bed inpatient unit attached to the general hospital and a separate community based service of eight mental health professionals. In 1988, the NSW state government in recognition of the problems of the homeless mentally ill in the inner city employed an additional 36 community based staff. The expanded service was integrated with existing hospital psychiatric services. The aim of the service was to provide a comprehensive 24 hour service to the mentally ill in the inner city, particularly the homeless mentally ill.

Table 5 shows the components of the current service and describes their function. The Community Mental Health Service is a multidisciplinary team providing the majority of the long-term clinical case management (Andrews & Teesson, 1994). The Mobile Community Treatment Service provides intensive case management to the most difficult patients in the service. The patients are seriously mentally ill, transient, frequently admitted to psychiatric hospitals, non-compliant with treatment and have very limited social skills. The service is staffed by three psychiatric nurses and one social worker and has documented its effectiveness (Teesson & Hambridge, 1992).

Table 5
Inner City Mental Health Service

Component	Staffing	Service	Function
Community Mental Health Service	12	Mon-Fri 9am-5pm	Ongoing individual clinical case management; staff to patient ratio no more than 1:30
Mobile Community Treatment	5	Mon-Sat 9am-5pm	Intensive case management to most disabled; staff to patient ratio no more than 1:10
Rehabilitation Service	7	Mon-Fri 9am-5pm	Drop-in, leisure activities, prevocational work program
Voluntary Agency & Crisis Service	17	7 days a week 8.30am-11pm 24 hour on call	24 hour mobile crisis service case management and regular clinics in refuges for homeless
Inpatient Unit	28 nurses 4 allied health 7 medical staff (27 beds)	24 hours 7 days a week	Acute admissions, voluntary and involuntary; regular outpatients clinics; 24 hr medical back-up to community
Unsupervised residence		4 places	Accommodation

The Rehabilitation Service is located in a separate site a few hundred metres from the community mental health centre building and provides a range of rehabilitation programs. The service is staffed by two occupational therapists, one psychologist and two social welfare workers.

The Voluntary Agency and Crisis Service combines the 24 hour crisis intervention service and a case management service to the residents of the refuges for the homeless in the area. Regular weekly clinics are held in the evenings at the major refuges. The team has two functions; the first is to provide 24 hour immediate intervention for patients in their own home environment when they are experiencing an acute exacerbation of their illness. The second function of the service is to provide ongoing individual case management to the mentally ill who reside in the refuges for the homeless (operated by voluntary agencies, hence the name) in the area. These two functions are covered by this one service as a substantial number of crisis referrals are from the refuges for the homeless in the area. The inpatient facilities in the inner city are provided by a psychiatric unit within a general teaching hospital there are on average about 700 admissions to this unit each year.

The ICMHS has integrated community and inpatient care. All new patients to the service between the hours of 9am to 5pm are seen at the community mental health centre and assessed by staff at that centre and where necessary the psychiatric registrar based there. This includes patients who present to the inpatient unit. Outside of these hours all emergency calls are taken by the Voluntary Agency and Crisis Service.

Caseload

On 8 November 1995, 591 people were being case managed by the ICMHS; 75% had a diagnosis of schizophrenia or bipolar disorder. Between June 1994 and July 1995, 1182 people were referred to the ICMHS for assessment, 46% had a diagnosis of schizophrenia, 10% had affective disorders. The median age was between 30 and 39. Twice as many males as females were referred to the Service.

The service was recommended as a model for integrated comprehensive mental health service by the Australian Chelmsford Royal Commission into Deep Sleep Therapy (1992). In 1993 the service won the Gold Award for integrated and comprehensive mental health services in Australia and New Zealand presented by the Australian Minister for Health. The award is judged by seven independent and expert assessors representing both professionals and consumers of services. In 1994 the entire service won the Australian Hospital Association Outreach Award for excellence.

The Australian rating of psychiatric services (Hoult & Burchmore, 1994) rated the ICMHS third in the country for excellence in service delivery to the seriously mentally ill. The community services were only one point behind the services rated best in the country, scoring 80%, the hospital services scored 70% and rehabilitation and accommodation only 10%. In summary the authors report:

> ...The service has done a credible job...The community component deserves praise for its assertive outreach into the shelters for the homeless; for its 24-hour availability. Rehabilitation programs ...though good, cater for relatively few people. Summing up, there are many areas that could be improved, but overall this is an impressive performance with a population with enormous problems. And if you were a mentally ill person who was homeless, then there must be few places where the mental health services would serve you better - certainly not in the big cities of the United States or the United Kingdom...

Recently the service was awarded the inaugural New South Wales' Health Promoting Hospitals Award for excellence in patient care (1996).

Method of Evaluation

Design

A quasi-experimental pre-post intervention design was employed in this evaluation. Measures of alcohol and drug use and their associated effects were taken at baseline and again 12 months after the commencement of intervention.

Issues in study design
The above study design was chosen as it was thought to require the least interruption to existing services and routine practice. A randomised controlled trial methodology was considered for the evaluation. Such a methodology would have required the allocation of this poorly engaged and disabled group of patients to treatment by the new service or routine care. This was assessed by clinicians and administrators of the service as impractical given the exploratory nature of the project and the anticipated high refusal rate of the inner city population.

Procedure for referral of clients
The target group for the project was:

> "people with a diagnosis of serious mental illness (schizophrenia or bipolar affective disorder, or a combination of both) who are case managed by the ICMHS and have had substantial substance misuse over the previous six months."

Clients who met the inclusion criteria were referred to the project for assessment.
The definition of substantial substance misuse was left to the discretion of the referees. The literature indicates poorer long-term outcome for those who have serious mental illness and use even small amounts of drugs or alcohol. Therefore, any substance use of illicit drugs and alcohol was also considered adequate criteria for referral.

Clients who were referred and met the inclusion criteria were administered a revised version of the Opiate Treatment Index (OTI) (Darke et al., 1991a; Darke et al., 1992). The revisions of the OTI were undertaken after consultation with the principal author of the measure and are outlined in detail below.

Subjects

One hundred and forty-nine clients, case managed by the ICMHS and with concurrent substance misuse, were referred to the Gemini Project. Of the 149 people referred, 83 were assessed. The remaining 66 were not assessed because they had moved out of the area before assessment could be made, refused assessment, or were inappropriate for treatment. Clients were considered inappropriate for treatment if they did not have a serious mental illness, had not used substances in the past six months, or had alcohol related brain damage and could be offered little in terms of treatment. Of the 83 clients assessed, sixty-seven received treatment. Sixteen of the assessed did not receive treatment as: 11 refused any intervention, four were not being case managed by the Service when treatment was offered, and one had alcohol-related brain damage. Twelve month follow-up data was completed for 37 of the treated clients. Follow-up data was not completed for 30 of the treated clients as: eight were assessed at the end of the Gemini Project's contract and had not had sufficient intervention to warrant follow-up data (these clients were referred back to routine care); eight had moved out of area; seven could not be contacted despite repeated attempts; six refused follow-up, and one was deceased. The referral to follow-up process for clients referred to the Gemini Team is summarised below.

Stage of Process	**N (% of previous stage)**

ICMHS Caseload	591
Referred	149 (25% of caseload)
Initially assessed for treatment	83 (55% of referred)
Treated	67 (80% of initial assessment)
Follow-up assessment	37 (55% of treated)

Measures

A comprehensive assessment of drug and alcohol use and its consequences was obtained using a modified version of the Opiate Treatment Index (OTI) at initial assessment and follow-up. The OTI is a multi-dimensional structured interview designed to evaluate opiate treatment (Darke et al., 1991a; Darke et al., 1992). The OTI has seven sections covering demographics and treatment history, drug use, HIV risk-taking behaviour, social functioning, criminality, health, and psychological adjustment. The Index has excellent psychometric properties (Darke et al., 1992). The modified OTI included questions from the OTIs treatment history, current drug use over the preceding three months, HIV risk-taking behaviour over the preceding month, and social functioning over the preceding six months.

As the OTI was designed for users of methadone services, several modifications were made to ensure the measure's utility with our target group. The main author of the measure was consulted regarding the changes made. The alterations are as follows. The treatment history section was expanded from chemical dependency treatments to include psychiatric treatments. The current drug use section was modified to measure average use based on quantity/frequency estimates of recent use. Although this method may grossly under-estimate consumption of alcohol (Gregson & Stacey, 1980 cited in Darke, Hall, Wodak, Heather, & Ward, 1992), trials by clinicians showed that the recent use episodes methodology employed by the OTI (Darke, Heather, Hall, Ward, & Wodak, 1991b) was too difficult for clients of this study to complete. Within the social functioning scale, the question relating to conflict with relatives was eliminated after trials found it held no relevance for the target group of clients. For consistency with the OTIs twelve item social functioning scale, subjects' mean score for the eleven items was multiplied by twelve to give a possible range of scores from 0-48. The HIV risk-taking behaviour section of the OTI was included without alteration and with a possible range of scores from 0-55. An additional section, drug use history, was included in the initial interview. The questions used the current drug use scale substances to establish whether respondents had ever used each substance and, if so, if and when their regular use began. The treatment and drug use history sections of the interview were omitted from the follow-up interview.

To measure psychological adjustment the OTI uses the General Health Questionnaire (GHQ-28), which provides a global measure of non-psychotic psychopathology. The GHQ-28 was substituted with the seven-point, clinician-rated, nursing modification version of the Brief Psychiatric Rating Scale (BPRS[NM]) (McGorry & Goodwin, 1988a; McGorry, Goodwin, & Stuart, 1988b). The psychiatric symptoms measured by the BPRS(NM) were considered more appropriate for the target group of people with serious mental illness. The BPRS(NM) is reliable and presumed to have adequate

validity (McGorry et al., 1988b). For all scales, higher scores indicate greater dysfunction. Diagnostic and demographic information was collected from a patient database (COMCAS).

Several months into the project questions relating to reasons for substance use were incorporated into the initial assessment interview. Thirteen commonly reported reasons for substance use were summarised from relevant literature (Test et al., 1989). These were listed and respondents were required to endorse which applied to them.

Reliance on self-report measures

The main measure of substance abuse and its consequences was a self-report measure. There is some evidence that people under-report their use of substances (Mueser et al., 1997). Alternative methods to self-report exist and include information from significant others, hair analysis, and urinalysis. Although self-report may result in distorted or under-reporting, it was considered the most practical method of information collection for this study as it created the least disruption to routine practice and was acceptable to the clients, most of whom did not have any relatives or friends who could act as informants.

Issues in the Reporting of the Results

This study was conducted in a very difficult area with a challenging group of clients. The exploratory nature of this work and the difficulties associated with collecting data with an often homeless, disaffiliated, seriously mentally ill and drug affected group imposes limitations on the reporting of the results. In many instances it was not possible to obtain information for numbers of clients. The results section is explicit about which information was obtained and any limitations to generalisability.

Procedure

The Gemini intervention comprised two stages:

Stage 1: Referred clients were interviewed, assessed, and engaged in the service.

Stage 2: Intervention was given which included both:

a) Gemini staff co-ordinating client referral to another treatment agency, for example, specialised detox services.

b) Gemini staff providing clinical interventions tailored to individual's needs. Motivational interviewing (Miller, 1996) was used to establish client's patterns and triggers for substance use and to incorporate discussion about use reduction. This was achieved by establishing:

- the level of drug use clients considered to be reasonable;
- the factors that made them use more drugs; and

- strategies, other than drugs, that clients could use to deal with the factors underlying their substance use.

Statistical Analysis

Missing data for the BPRS(NM) and OTI was dealt with by substituting missing values within each scale with the respondent's mean score for the completed items, if at least half of the items in each scale had valid values. If more than half of the items within each scale were invalid, a scale score was not computed. Data was analysed using the Statistical Package for the Social Sciences (SPSS).

Results

Characteristics of Clients Assessed for Treatment

Part one of the results section examines the characteristics of the 83 clients assessed for treatment. This has been included as it provides an informative snapshot of the substance use within this seriously mentally ill group. This information will hopefully help guide service delivery planning in the future. Respondent numbers are reported for each section of the interview as the amount of information obtained was dependent upon client engagement and clinician assessment as to its relevance. For example, a number of clients referred for treatment of tobacco dependence were only administered the current drug use section of the interview.

The 83 clients initially assessed by the Gemini Team comprised 59 males (71%) and 24 females (29%). They ranged in age from 18 to 74 years and had an average age of 38 years (SD = 13.8). The most common primary diagnoses were schizophrenia (65%), neurotic disorders (10%), affective disorder (10%), depression (8%), and personality disorder (3%).

Table 6 shows the extensive drug taking histories of these clients. The most commonly used drugs, currently and across the lifetime, were tobacco, alcohol, and cannabis. In addition to these substances up to half of the respondents also reported past benzodiazepine (52%), amphetamine (46%), cocaine (43%), or heroin use (37%). In terms of current use, the most popular drug after tobacco, alcohol, and cannabis was heroin which continued to be used by 11% of subjects. Methadone had been tried by 18% of the sample but was currently being used by only 6%.

Table 6
Lifetime and current (past 3 months) substance used

Substance	Lifetime		Current	
	n	Use (%)	n	Use (%)
Tobacco	**64**	**61 (73.5)**	**79**	**71 (85.6)**
Alcohol	**65**	**60 (72.3)**	**82**	**49 (59.0)**
Cannabis	**64**	**54 (65.1)**	**78**	**24 (28.9)**
Heroin	65	31 (37.3)	80	9 (10.8)
Benzodiazepines	64	43 (51.8)	81	8 (9.6)
Methadone	65	15 (18.1)	82	5 (6.0)
Amphetamines	64	38 (45.8)	81	4 (4.8)
Codeine Linctus	65	19 (22.9)	82	4 (4.8)
Cocaine	64	36 (43.4)	82	2 (2.4)
Hallucinogens	64	32 (38.6)	82	1 (1.2)
Inhalents	64	23 (27.7)	82	1 (1.2)
Barbiturates	63	11 (13.3)	82	0 (0.0)
Other (not specified)	63	16 (19.3)	80	5 (6.0)

The current patterns of use differ for the most commonly used drugs of tobacco, alcohol, and cannabis. All cannabis users and virtually all alcohol users (94%) also reported current use of at least one other substance. In contrast, tobacco users were less likely to be polydrug users with 79% using any additional substance, most often alcohol (57%).

Of the 49 subjects currently using alcohol over half (57%), 7 females (14%) and 21 males (43%), reported drinking in excess of the weekly recommended intake of no more than ten or 20 drinks, respectively. The true proportion of alcohol abuse in this group undoubtedly exceeds this figure, given that self-reports of average consumption may grossly underestimate consumption (Gregson & Stacey, 1980 cited in Darke et al., 1992; Mueser et al., 1997) and fail to include instances of binge drinking.

The high proportion of polydrug use in this sample is demonstrated in Table 7. Two-thirds (67%) of respondents reported past use of five or more of the thirteen aforementioned substances (refer Table 6). A third (36%) of clients reported current use of three or more substances. On average, however, most clients were currently using only two substances in comparison to the six or seven they had used in their lifetime.

Table 7
Lifetime and current (past 3 months) number of any substances used

No. of substances	Lifetime (n=64)	Current (n=82)
	n (%)	n (%)
0	0 (0.0)	0 (0.0)
1	0 (0.0)	24 (29.3)
2	6 (9.4)	28 (34.1)
3	8 (12.5)	17 (20.7)
4	7 (10.9)	9 (11.0)
5 or more	43 (67.3)	4 (4.8)
Mean (SD)	6.8 (3.3)	2.3 (2.2)

In order to understand the polydrug use of illicit substances, the data was split on the basis of illicit versus non-illicit substances. Table 8 displays the polydrug use for illicit substances only. This count includes cannabis, heroin, amphetamines, codeine, cocaine, hallucinogens, inhalents and *other* drugs. The substances of tobacco, alcohol, benzodiazepines, methadone, and barbiturates that were included for Table 7 calculations have been omitted.

As shown in Table 8, on average, clients had used four illicit drugs during their lifetime but were currently only using an average of one. Comparison of average overall versus illicit drug use (see Table 7 and Table 8) indicates that illicit drugs comprised half (57%) of the substances used across the lifetime but only one quarter (28%) of those currently used. Furthermore, of the 36 (44%) clients currently using illicit substances, most (67%) were using cannabis (refer Table 6).

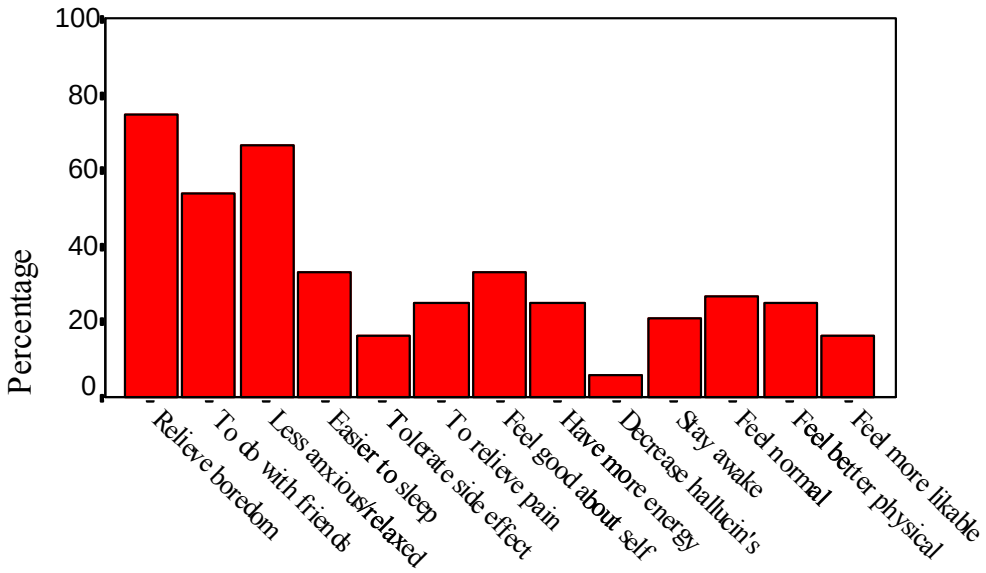
Table 8
Lifetime and current (past 3 months) number of illicit substances used

No. of illicit substances	Lifetime (n=64)	Current (n=82)
	n (%)	n (%)
0	9 (14.1)	46 (56.1)
1	7 (10.9)	24 (29.3)
2	7 (10.9)	8 (9.6)
3	6 (9.4)	3 (3.6)
4	4 (6.3)	1 (1.2)
5 or more	31 (48.5)	0 (0.0)
Mean (SD)	3.9 (2.6)	0.65 (0.9)

The reasons clients gave for using drugs or alcohol are displayed in Figure 1. Over half the respondents used substances to relieve boredom (75%), feel less anxious or relaxed (67%), or to be able to do something with friends (54%). Surprisingly, the least common reasons were those directly linked to having a mental illness or taking

medication. Few clients reported using substances to decrease hallucinations (6%), make side effects tolerable (17%), or to stay awake (21%).

Figure 1
Reasons for substance use



The clients' reported treatment history is outlined in Table 9. Over half the respondents reported having received treatment for drug and alcohol use via: a hospital (60%), home detox (57%), a detox unit (52%), or narcotics anonymous (50%). These methods were more popular than the longer-term treatments such as rehabilitation, counselling/psychotherapy, methadone clinics, and controlled drinking classes which tended to be frequented by less than a quarter of respondents.

Table 9
Treatment for substance use

Type of treatment	**n**	**Yes (%)**
Psychiatric unit admission for D&A	57	34 (59.6)
Home detox	61	35 (57.4)
Detox unit	63	33 (52.4)
Narcotics anonymous	60	30 (50.0)
Long-term rehabilitation	59	16 (27.1)
Long-term counselling/psychotherapy	59	13 (22.0)
Methadone	63	10 (15.9)
Controlled drinking class	59	2 (3.4)

Table 10 presents the number of different drug and alcohol treatments clients have

previously received. The chronic nature of subjects' substance use problems is highlighted by the high proportion of respondents (86%) who have undergone previous treatment. On average, subjects had tried two or three types of treatment although nearly a quarter (22%) had tried at least five of the eight different treatments.

Table 10
No. of previous treatments for chemical dependency

No. of treatments	Lifetime (n=59)
	n (%)
0	8 (13.6)
1	10 (16.9)
2	10 (16.9)
3	9 (15.3)
4	9 (15.3)
5 or more	13 (22.0)
Mean (SD)	2.75 (1.8)

Aside from treatment for substance use, all clients were also receiving medication (34%) or some other treatment for a psychiatric illness (97%) (see Table 11). The impact of comorbid substance use and serious mental illness is reflected in part by the large proportion of respondents who had received treatment for deliberate self-harm or attempted suicide (52%), or accidental overdose (22%).

Table 11
Psychiatric or medical treatment

Type of treatment	n	Yes (%)
Treatment for Psychiatric or medical conditions		
Current treatment of psychiatric illness	62	60 (96.8)
Current prescribed medication	61	21 (34.4)
Current treatment for medical problems	61	17 (27.9)
Treatment for self-harm/accidental overdose		
Deliberate self-harm/attempted suicide	60	31 (51.7)
Accidental overdose & hospitalisation	60	13 (21.7)

Responses to the HIV risk-behaviour scale questions are displayed in Table 12. As shown, a small proportion of the Gemini clients were engaging in many behaviours over the past month that exposed themselves and others to considerable risk for HIV infection. In comparing the clients in this study to those in treatment for opioid abuse, the scores on social functioning and HIV risk-taking correspond (see Table 13). This highlights the vulnerable nature of dually diagnosed clients, whose poor social

functioning and high HIV risk-taking behaviour parallels that of opioid users.

Table 12
HIV risk-taking behaviour

HIV Risk-Taking Behaviour (past month)	**n (%)**
Drug Use (n = 54)	
Hit up at least once	12 (22.2)
Re-used needle after someone else	5 (9.3)
Using a needle after others had used it	7 (13.0)
Others used a needle after you had used it	4 (7.4)
Used needles without cleaning them	6 (11.1)
Reused needles without bleaching them	7 (13.0)
Sexual Behaviour (n = 46)	
Sex with: one person	7 (13.0)
3-5 people	1 (1.8)
Sex with regular partner without condom	7 (13.0)
Sex with casual partner without condom	7 (13.0)
Paid sex without condom	6 (11.1)
Anal sex	2 (3.7)

The low mean score for the BPRS(NM), indicating the existence of only minimal psychiatric symptoms, reflects the chronic, as opposed to acute, nature of this group (Table 13). The restriction in range on this measure also suggests it may be difficult to obtain significant movements towards less symptomatic behaviour after treatment.
Table 13
Descriptive Statistics for Outcome measures: Pre-treatment versus OTI Sample

Outcome Measures	**Pre-treatment (N = 83)**		**OTI Validation Sample Opioid Users (N = 290)**	
Scales	**n**	**mean (SD)**	**n**	**mean (SD)**
Social Functioning	55	20.94 (7.65)	254	20.5 (7.2)
HIV Risk-Taking Behaviour[17]	45	5.27 (7.21)	290	9.0 (7.1)
BPRS(NM)	44	8.91 (5.58)		-

Outcome of Treatment

[7] Prior to calculating the mean, an outlier with a standardised score in excess of 3.0 was removed.

Objective 1: To develop a relevant and effective treatment program for substance abuse to be run in addition to existing case management services.

The outcome of clients treated by the Gemini Team will be presented in this second section of the results. Analysis will focus primarily on the 37 clients who were treated and followed-up. Respondent numbers will continue to be reported for each analysis to account for the variation in missing data between scales.

Table 14 displays the initial assessment (pre-treatment) scores for clients who were followed-up versus those not followed-up. Seven outliers with standardised scores in excess of 3.0 were removed prior to calculation of the descriptive statistics and subsequent analysis of variance[8].

Table 14
Descriptive Statistics for Outcome measures: Pre- treatment scores for clients followed-up versus clients not followed-up

Outcome Measures	**Followed-up**		**Not followed-up**	
Scales	**n**	**mean (SD)**	**n**	**mean (SD)**
Social Functioning	27	20.96 (6.32)	28	20.91 (8.87)
HIV Risk-Taking Behaviour	24	3.04 (5.33)	21	6.43 (6.9)
BPRS(NM)	20	8.25 (5.03)	24	9.46 (6.04)
Current Drug Use[9]				
Tobacco weekly use	35	208.87 (121.93)	42	162.12 (99.57)
Alcohol weekly use	36	14.38 (20.25)	44	21.58 (38.41)
Cannabis weekly use	35	5.70 (17.63)	41	5.96 (16.52)
Current No. of Substances Used	37	2.22 (1.11)	45	2.38 (1.30)

An analysis of variance (MANOVA) was conducted to test the null hypothesis that the groups (followed-up versus not followed-up) did not differ on the following dependent variables: Social functioning, HIV risk-taking behaviour, BPRS(NM) weekly use of tobacco, alcohol, and cannabis, and total number of substances used (see Appendix E). A non-significant main effect for group on the combined dependent variables (Wilks' $F_{7,22} = 1.40$, $p = .254$) led to acceptance of the null hypothesis. Social functioning, HIV risk-taking behaviour, weekly use of tobacco, alcohol, and cannabis, and total number of substances used did not differ between clients who were and were not followed-up. A post-hoc power analysis indicated that the MANOVA had moderate power (0.46 at α =

[8] These included one followed-up client from HIV risk behaviour and one client from the followed-up and not followed-up groups for tobacco, alcohol and cannabis weekly use.
[9] Tobacco counts the number of cigarettes, alcohol the number of standard drinks, and cannabis the number of joints or cones, clients use on a weekly basis.

0.05) to detect differences between the groups.

To examine reasons why subjects failed to remain in treatment a stepwise logistic regression analysis was performed to determine whether gender, age, or the use of illicit substances at initial assessment were predictive of a client's follow-up status[10] (see Appendix F). The illicit drug variable calculated the number of illicit drugs clients used including heroin, codeine, cannabis, amphetamines, cocaine, hallucinogens, inhalents, and non-specific other medication used "to get high". A test of the full model with all three predictors against a constant-only model was statistically reliable, χ^2 (3, N = 71) = 8.94, $p < .05$, indicating that the predictors, as a set, reliably distinguished between clients who were or were not followed-up. When fitted last all variables failed to reach significance using a liberal α level of 0.05, although both age (Z = 3.34, R = 0.9), and gender (Z = 2.88, R = 0.12) made small partial contributions to the model. Using a backward stepwise technique with tests for removal based on the likelihood ratio with an exclusion criteria of α = 0.06 a model with age alone was the best predictor of follow-up status χ^2 (1, N = 71) = 5.81, $p < 0.05$. Age was significantly related to, and accounted for 18% of the variance in, follow-up status (Z = 5.14, R = 0.18, $p < 0.05$[11]). Thus, a client's gender or use of illicit drugs did not reliably predict whether they would remain in treatment until follow-up. The best predictor of a client's follow-up status was their age. Older clients were more likely to remain in treatment until follow-up.

The results of this analysis, coupled with the lack of significant differences found in the initial assessment scores suggest that many random factors are associated with clients follow-up status. If systematic factors, other than a client's age, do exist to predict follow-up status they cannot be determined by this study as they have been shown to be unrelated to a client's pattern of drug use, social functioning, psychiatric symptomatology, or gender.

Table 15 shows the scale scores for the clients who were treated and followed-up. The scores indicate a slight increase in social functioning and decrease in psychiatric symptoms after treatment. Current drug use, in terms of the three most commonly used drugs of tobacco, alcohol, and cannabis, showed a similar trend with average use across the group decreasing after treatment. The number of different drugs used by subjects appeared to differ little after treatment, with clients continuing to use an average of two drugs.

[10] The follow-up variable excluded the eight cases who were assessed too late in the project to warrant follow-up.

[11] Taking into account the three independent variables and using a more stringent α level of 0.016, age only borders on statistical significance.

Table 15
Descriptive Statistics for Outcome measures: Clients with both pre- and post-treatment scores

Outcome Measures	**Pre-treatment (n = 37)**		**Post-treatment (n = 37)**
Scales	**mean (SD)**	**n**	**mean (SD)**
Social Functioning	20.93 (6.57)	25	18.03 (6.88)
HIV Risk-Taking Behaviour	3.32 (5.49)	22	3.30 (4.45)
BPRS(NM)	8.0 (3.74)	13	5.26 (3.85)
Current Drug Use			
Tobacco weekly use	206.68 (125.03)	33	161.95 (99.93)
Alcohol weekly use	13.4 (20.57)	33	7.75 (11.78)
Cannabis weekly use	5.07 (18.19)	33	1.15 (3.48)
Current No. of Substances Used	2.17 (1.08)	36	2.14 (1.43)

Paired t-tests were used to formally test for statistical differences between pre- and post-treatment scores on the BPRS(NM) and OTI scales. This method of analysis was chosen over a repeated measures multiple analysis of variance as there were small numbers of paired cases within the OTI and BPRS(NM) scales. This problem would have been accentuated with a multivariate approach. Bonferroni adjustment was used to adjust the standard 0.05 alpha level to account for the seven tests performed. This resulted in a conservative alpha of 0.007. Nine outliers, having standardised scores in excess of 3.00, were omitted prior to conducting the pairwise analyses[12]. Their removal had no influence on the significance of any of the pairwise tests (Tabachnick & Fidell, 1989 cf Gardner & Altman, 1989).

As shown in Table 16, using an adjusted alpha level of 0.007, there were no significant differences for any of the mean scale scores although an improvement in social functioning approached significance. The HIV risk-taking behaviour scale showed little difference between pre- and post-scores. The lack of significant improvement in BPRS(NM) score may, in part, be a reflection of the floor effect and restriction in range.

There was also no significant difference in the average weekly consumption of tobacco, alcohol, and cannabis, nor in the number of different substances currently used after, compared to before, treatment (Table 16). The differences in pre- to post-treatment tobacco and alcohol consumption did suggest a trend for clients to be using less of these substances per week after having received treatment. These findings are consistent with a harm minimisation approach to treatment as opposed to an abstinence

[12] These included one case from pre-treatment HIV risk behaviour, post-treatment BPRS(NM), pre-treatment tobacco use, pre- and post-cannabis use, pre-and post-no. of current drugs used, and two cases from pre-treatment alcohol use.

based treatment where the goal would be no drug use.

Table 16

Paired T-tests for outcome measures: Pre- minus post-treatment scores

Outcome Measures	Mean Diff (SD)	t	df	p
Scales				
Social Functioning (/12)	2.90 (6.70)	2.16	24	0.041
HIV Risk-Taking Behaviour	0.02 (6.46)	0.01	21	0.991
BPRS(NM)	2.74 (5.54)	1.78	12	0.1
Current Drug Use				
Tobacco weekly use	44.73 (111.80)	2.30	32	0.028
Alcohol weekly use	5.66 (14.76)	2.20	32	0.035
Cannabis weekly use	3.92 (14.93)	1.51	32	0.141
Current No. of Substances Used	0.03 (0.88)	0.19	35	0.85

Although abstinence was not a goal of treatment for the Gemini clients, patterns of drug use pre- and post-treatment was examined. As shown in Table 17, five people reported stopping their use of alcohol altogether during the course of the study and smaller numbers stopped their use of heroin (1), cannabis (1), benzodiazepines (3), and tobacco (3). Conversely, a number of clients actually began using substances during the course of the intervention including heroin (2), alcohol (3), cannabis (2), amphetamines (1), cocaine (1), benzodiazepines (2), and other (not specified) (2). These findings accentuate the difficulties associated with treating people who abuse a substantial number of substances.

Table 17
Current substances used: Pre- and post-treatment

Substance	Pre Intervention	Post Intervention				
	Users(followed-up) n	**Stopped Use n**	**Used Less n**	**Same Use n**	**Used More n**	**Began Use n**
Heroin	9 (2)	1	1			2
Codeine Linctus	4 (2)		1		1	
Alcohol	49 (20)	5	9		6	3
Cannabis	24 (8)	1	3	2	2	2
Amphetamines	4 (0)					1
Cocaine	2 (0)					1
Benzodiazepines	8 (5)	3	2			2
Barbiturates	0 (0)					
Hallucinogens	1 (0)					
Inhalents	1 (0)					
Tobacco	71 (31)	3	11	10	7	
Other (not specified)	5 (1)				1	2
TOTAL		13	27	12	17	13

Objective 2: To develop links between mental health and drug and alcohol treatment services and non-government organisations.

The establishment of a management committee of senior representatives of drug and alcohol, mental health, and relevant non-government organisations was successfully accomplished. This group met monthly to guide the project and discuss issues relevant to the areas of both drug and alcohol and mental health.

Despite links being developed between mental health and drug and alcohol services, it was not always possible to increase clients access to services. The outcome of this process is outlined below.

Survey of the Service

In an attempt to explain the low rates of referral to the Gemini Project, surveys were distributed to all clinicians in relevant mental health, drug and alcohol, and non-government organisations (see Appendix G). The questionnaires were modified slightly to suit each of the various services. Approximately fifty percent of clinicians responded to the survey. Results showed that about 25% of clients in drug and alcohol treatment were identified as having a mental illness, between 25-50% of clients in the mental health system were identified as having a substance misuse problem and at least 50% of the non-government organisations' clients were identified as having a dual diagnosis. Respondents indicated that the clinicians were satisfied with the assessments or interventions given by the Gemini Team. The most common reasons given for non-referral from the mental health sector were that clients: Were too unstable or psychotic; had refused intervention; were serviced by the private sector and were not receiving case management. Within the drug and alcohol sector, clients were not referred because: Staff were untrained and unable to diagnose a mental illness; clients were not eligible for case management or were already receiving mental health services. The non-government organisations' reasons for non-referral were that their clients: Refused to acknowledge mental health issues; refused any intervention; or were serviced by the private sector and were not receiving case management.

Medicated Detox Services

There were several problems with the medicated detox services that could not be rectified by the Gemini Team's involvement and access to this service for the target group of clients remained difficult. Clients were never referred to the service if their mental state was unstable, however, entry to inpatient beds was often refused on the basis that clients:

1) were too intoxicated to warrant admission.

2) were not intoxicated enough to warrant admission.

3) had a past incident of abusive/threatening behaviour which, in some instances, may have occurred up to ten years ago.

4) were considered potentially too difficult to manage as inpatients because of their

mental illness. Staffing levels and staff safety were cited as reasons for non-acceptance.

A further barrier to care was the lengthy and delayed admission process of the medicated detox services which often left clients and project staff feeling agitated. Furthermore, any irritation displayed by clients was attributed to their mental illness, rather than as a normal reaction to waiting several hours for a pre-arranged service.

These issues were compounded by the fact that until recently the medicated detox service was a tobacco free campus. Nicotine replacement therapy was offered to clients on admission but few clients were prepared to consider going there because of the tobacco free policy. Considering smoking is the most addictive behaviour among psychiatric patients (O'Farrell, Connors, & Upper, 1983) and particularly amongst patients with a diagnosis of schizophrenia or mania (Hughes, Hatsukami, Mitchell, & Dahlgren, 1986), this policy was problematic and resulted in reduced treatment access for a large sector of the community.

Non-Medicated Detox Services

Admission to the non-medicated detox service was not a problem in principle, except that the bed occupancy rate averaged around 130%. Staff of this service had no issue with admitting clients who were potentially behaviourally disturbed or who had a concurrent mental health problem. Staff safety was never raised as an issue in relation to treatment access for clients at this centre. The staff of this service were not medically trained so close links were developed with the crisis mental health service to enable better management of dually diagnosed clients. This detox service remains one of the most user friendly drug and alcohol services for the target group of clients.

Methadone Services

In the past, access to methadone services has been difficult for this client group. To rectify this situation, case managers were given information about what the methadone services could do for their clients, many of whom were using a range of non-opioid substances. The procedure involved in enlisting a client for methadone treatment was also clearly outlined by Project staff. These steps improved treatment access for the target group of clients.

Drug and Alcohol Counselling Services

Access to drug and alcohol counselling services improved since the commencement of the Gemini project. To reduce incidents of clients being "bounced" back to mental health services, the project team attended case allocation meetings twice weekly to advocate for clients' negotiating treatment. This intervention improved treatment access in the short-term, however, the changes are unlikely to be maintained now the Gemini project has finished as there is longer an ICMHS advocate to act on clients' behalf. Additional problems with the services that could not be overcome by the Gemini Team include inflexibility and lack of assertive follow-up.

Objective 3: Provide training for mental health and drug and alcohol workers in the treatment of persons with serious mental illness and concurrent

substance misuse.

Comprehensive training packages were developed and training sessions were made available to all staff. The seminars were well attended, with between 10-20 people per session. Excellent feedback was received from all attendees, with requests for more courses continually received. Welfare workers in the field found the training highly appropriate and extremely relevant. A concern was that the training program was only taken up by staff of the non-government organisations, not by staff of the mental health and drug and alcohol programs. A possible reason for non-attendance is that the training sessions were not accredited courses.

The training program was accompanied by a manual and served a dual purpose of allowing skills acquisition in addition to raising clinicians' awareness of dual diagnosis issues. The success of this intervention, however, was limited to those who actually attended the training sessions.

Discussion

This study examined the effect of implementing an integrated treatment program for persons with serious mental illness and concurrent substance misuse in an inner city area. The three main objectives of the intervention were to:

1. develop a relevant and effective treatment program for substance abuse to be run in addition to existing case management services.

2. develop links between mental health and drug and alcohol treatment services and non-government organisations.

3. provide training for mental health and drug and alcohol workers in the treatment of persons with serious mental illness and concurrent substance misuse.

The clinical effect of the service is reported first. The four main clinical objectives were to:

a) reduce substance misuse;
b) improve social functioning;
c) reduce HIV risk-taking behaviour, and
d) reduce psychiatric symptoms.

Eighty-three of the 149 clients referred by case managers of the ICMHS were assessed by the Gemini Team. Sixty-seven received treatment and 37 remained with the program to receive follow-up assessment after twelve months. Overall the results showed that the treatment intervention made only a modest difference to substance misuse, social functioning, HIV risk-taking behaviour, and psychiatric symptoms.

The first hypothesis, that subjects who received treatment would reduce their substance misuse, was partially supported. Using a modified version of the OTI, no significant decrease in substance use was found. Clients continued to use an average of two

substances even after treatment. There was a trend, however, towards clients using less tobacco, alcohol, and cannabis per week after treatment. Of the clients who were followed-up, approximately half were successful in lowering or stopping their use of tobacco or cannabis and an even greater proportion were able to decrease or stop their use of alcohol. During the course of the study there were 13 instances in which clients stopped their use of a substance. This finding was tempered by the 13 instances in which clients began using a substance.

The second hypothesis, that subjects who received treatment would show an improvement in social functioning, was marginally supported. There was a non-significant trend towards improved social functioning for those who received treatment. Prior to treatment, the group's social functioning, measured by the OTI, was on par with that of opioid users. Given this group's low social functioning and their intervention-resistant substance use, the expectation of a significant improvement in social functioning may have been unrealistic.

The third hypothesis, that subjects would reduce their HIV risk-taking behaviour, was not supported. The OTI detected no decrease in clients' risk-taking behaviour after treatment. Clients' risk for HIV infection continued to rival that of a high risk group of opioid users. Despite the risk-taking behaviour being confined to a small proportion of clients, in practical terms it is highly significant as it indicates that many clients are continuing to put themselves and others at risk for HIV infection.

The final hypothesis, that subjects would show a reduction in psychiatric symptoms, was not supported. Clients' psychiatric symptoms did not significantly change despite the trend towards improvement after treatment. The BPRS(NM) detected a very low level of psychopathology for the group. It is possible that the measure failed to detect the subjects' level of symptomatology as those who took part in the study were a chronic group with little acute psychopathology. If this was the case, any improvement in symptoms would have been difficult to detect.

Overall, the Gemini project clients who received intervention and follow-up showed only moderate change. There was no statistically significant improvement in any of the expected areas. Given the poorer long-term outcome of clients with comorbid mental illness and substance use, the trend towards reduced use of tobacco, alcohol, and cannabis and improved social functioning and psychiatric symptomatology may be clinically, if not statistically, significant.

The proportion of clients using the most common substances of tobacco, alcohol, and cannabis, within this group was markedly similar to that found in a sample of regional Australian mental health service clients (Fowler et al., in press). The main difference between the groups was that for regional clients amphetamines was the most common drug after cannabis whilst for inner city clients it was heroin. In general, the group's use of tobacco, alcohol and cannabis was consistent with previous research in both general population and clinical settings (e.g., Anthony et al., 1994; Cuffel et al., 1993; Drake et al., 1990; Lehman et al., 1994; Menezes et al., 1996).

The resilience of the groups' substance use was highlighted by the high proportion of

clients (86%) who had received previous treatment for a substance use disorder. On average, clients had tried two or three different types of treatment prior to the Gemini intervention. The finding that only half (55%) the group completed the Gemini treatment may explain why clients' previous treatment was unsuccessful. Aside from age, which predicted a small proportion of variance in follow-up status, other factors predicting a client's tenure in treatment could not be determined from this study as it was not related to their pre-treatment OTI or BPRS(NM) scores, nor to their gender, or use of illicit drugs. Most likely, unmeasured factors relating to accommodation and transience may be the best predictors of follow-up for this group.

The reasons clients gave for substance use did not support the self-medication hypothesis. Consistent with previous studies (Fowler et al., in press; Test et al., 1989), clients reported using substances to relieve boredom, relieve anxiety or to be able to do something with friends (cf. Dixon et al., 1990). Very few clients reported using substances for reasons directly related to their mental illness. In this respect the group was similar to the general population.

Limitations of the Study

This was a naturalistic study designed to evaluate an innovative method of treatment delivery within an existing service. The complex nature of clients' problems and the demanding nature of the inner city area made this a very challenging project to complete. The following limitations of this study should therefore be considered in conjunction with the findings.

Firstly, a pre- post test design was chosen as the most unobtrusive method of measuring the effectiveness of this new intervention. This type of design means that effects that may mimic treatment effects must be considered when examining outcome. However, it is very unlikely that the two main effects which may mimic treatment, placebo and spontaneous remission, would have occurred in people with chronic and severe illness.

The problems associated with estimates of substance use should also be considered. It is extremely difficult to estimate the dose of most substances as, unlike alcohol, quantities for illicit drugs are not standardised (Darke et al., 1991b). The rate of substance use may also have been grossly underestimated given the self-reported average use methodology employed in this study (Mueser et al., 1997).

The length of follow-up in clinical trials is also important. The expectation of change in the OTI and BPRS(NM) measures within a twelve month follow-up period in such a disabled group may have been ambitious. The trend towards reduced substance use and, in particular, improvements in social functioning and psychiatric symptomatology (Harding, Zubin, & Strauss, 1987) would be expected to improve over time. Greater benefits following treatment may have been evident given a longer follow-up. Given the attrition rate within the twelve months of this study, however, maintaining contact with this transient, disaffiliated, and often homeless group over a longer-term would have been difficult.

The Gemini service only offered treatment to people case managed by the ICMHS, diagnosed with a serious mental illness, and with substantial substance misuse over the past six months. The Gemini program comprised chronic long-term case managed clients, most of whom had a diagnosis of schizophrenia. The group had low social functioning skills, high levels of polydrug and heroin abuse, and included many clients whose behaviour subjected themselves and others to risk of HIV infection. The outcome of the treatment interventions for this group may not generalise to similarly diagnosed but less disabled groups.

The Process of Gemini

Implementing System Change and Staff Training

The Gemini Project aimed to improve links between mental health and drug and alcohol treatment services and provide training to staff of these services. The extent to which the project achieved these objectives and the difficulties encountered in this process are outlined below.

A management committee consisting of senior management and representatives from drug and alcohol, mental health, and non-government organisation services was successfully established as part of the study. This was a significant and innovative achievement.

Based on findings from the educational needs assessment, a staff training manual and program of inservice courses was developed. The courses were well-attended by staff from non-government organisations with feedback given suggesting the sessions were extremely valuable and informative. Notwithstanding the disappointing lack of attendance by staff from the mental health and drug and alcohol programs, which was beyond the control of the Gemini team, it can be concluded that the project staff achieved their aim of making training available to all relevant staff.

The implementation of the abovementioned project aims was made difficult due to the issues outlined below.

Political Climate

Over the two years' duration of the Gemini project, an ongoing process of review and restructuring was occurring in drug and alcohol and mental health services within the public health sector. This included the amalgamation of Eastern Sydney Area Health Service with Southern Sydney Area Health Service to become South Eastern Sydney Area Health Service. As with any major organisational change many staff felt uncertain about the future of their service and the impact that the restructuring would have on their ability to provide services to clients. Within this climate of uncertainty it was difficult to implement the system change the Gemini Team was attempting.

Referral and Retention Rates

Within the first six months of the project it became clear that most clients identified by drug and alcohol services as having a dual diagnosis had psychiatric diagnoses of anxiety or personality disorders. The target of the current project was serious mental illness. Therefore, the majority of people seen in drug and alcohol services were inappropriate for intervention by the Gemini Service.

A further problem was that many of the clients referred in the beginning of the project were at the end of their drinking or drug using career, suffered from alcohol related brain damage, and could be offered little in terms of treatment. The high rate of transience amongst clients also meant that many had disappeared from the system before they could be assessed by Gemini staff.

Alcohol Related Brain Damage

Most clients identified by the non-government organisations in the inner city as having comorbid disorders were those presenting with behavioural disorders, most of whom exhibited symptoms of alcohol related brain damage. Currently there are no treatment interventions available in metropolitan Sydney for this group of clients. Testing facilities are available but require that the client is drug and alcohol free for a minimum of forty-eight hours - an almost impossible task for the majority of this client group. The Drug and Alcohol Directorate view alcohol related brain damage as an accommodation rather than a health issue and allocates little if any resources to it. As this group's needs remain unmet by the health care system as a whole the Gemini Team could not hope to meet the needs of this client group.

Mini Drug and Alcohol Assessment

The mini drug and alcohol assessment was implemented to raise clinicians' awareness of drug and alcohol issues, automate the referral process and enable clients to be referred in the early stages of their substance use. These aims were not met. The number and type of referrals did not change after the introduction of this measure. The mini assessment was supported but not followed-up by mental health program managers. For the majority of mental health clinicians, crisis and clinical workloads often took precedence over planned service delivery and the identification of drug and alcohol issues remained a low priority. Clearly, endorsing new policies does not automatically guarantee system change or improvement. Permanent system change can only be achieved through continuous monitoring and re-evaluation.

Summation

An innovative treatment project was instigated in the inner city area of Sydney to address the problem of severe mental illness and substance misuse. Subjects were measured on drug taking, social functioning, HIV risk-taking behaviour, and psychiatric symptoms before and after intervention. The program aimed to develop an effective treatment program, link mental health and drug and alcohol service systems, and provide training for relevant staff. All aims were met with moderate success.

Of the 83 clients initially assessed by the Gemini Team, 37 completed treatment and final assessment. After treatment clients showed a trend towards reduced substance use and improvements in social functioning and psychiatric symptomatology. Given that treating people with mental illness and drug and alcohol use is difficult, these findings indicate the program achieved moderate success Even with well resourced research and model programs, major changes in clinical and social functioning are not the rule. Disability and dependence generally persist (Marks, 1992). The findings within this

service are no different to those found in the United States or the United Kingdom.

This naturalistic study was a response to real problems in difficult and demanding areas. It did not have the luxury of control found in many other studies. The case managers were busy, the service system was constantly changing and the clients represented one of the most difficult groups to engage. Despite these difficulties, the Gemini Team made contact with 25% of the ICMHS client caseload. This is in accordance with the proportion of community mental health clients reported in the literature as meeting criteria for substance abuse or dependence.

The clients treated by the Gemini team were very disabled. They had extremely low social functioning skills, many were engaging in high levels of HIV risk-taking behaviour, most had received previous treatment for substance use and, on average, the group were using two substances both before and after treatment. The expectation of change in drug use, social functioning, HIV risk-taking behaviour, and psychiatric symptoms in twelve months in this very chronic and disabled group was ambitious.

In conclusion, despite only minor improvements in the outcome measures the project succeeded in linking drug and alcohol and mental health services and providing training to staff. Since the completion of the Gemini project the Inner City Mental Health Service has not had funding to specifically target the drug and alcohol issues of clients with serious mental illness. It is unlikely that the emphasis on dual diagnosis and the importance of addressing these issues concurrently will be sustained in the absence of such funding.

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Appendices

Appendix A: Mini Drug and Alcohol Assessment Tool

Appendix B: Mini Drug and Alcohol Assessment

Table B- 1 to Table B- 4 give a snapshot of the current drug use of ICMHS clients as reported by case managers using the mini drug and alcohol assessment. It should be noted that data was only received on 215 of the 591 registered clients and may therefore not be representative of the entire client population.

Table B- 1 shows the extensive current drug use undertaken by some of the ICMH Service's clients with approximately three quarters of clients using tobacco (77.3%) or alcohol (63.3%) and over a quarter using cannabis (31.7%). Other popular currently used drugs were benzodiazepines, heroin, amphetamines, and cocaine, with over 7% of respondents reporting current use of these substances.

Table B- 1
Current (past 3 months) substance use (N=215)

Substance	**n**	**Use (%)**
Tobacco	**194**	**150 (77.3)**
Alcohol	**180**	**114 (63.3)**
Cannabis	**180**	**57 (31.7)**
Heroin	170	13 (7.6)
Benzodiazepines	176	25 (14.2)
Methadone	172	4 (2.3)
Amphetamines	173	13 (7.5)
Codeine Linctus	172	4 (2.3)
Cocaine	170	12 (7.1)
Hallucinogens	170	5 (2.9)
Inhalents	172	1 (0.6)
Barbiturates	172	0 (0.0)
Other:	170	12 (7.1)
Artane	170	6 (3.5)
Kemadrin	170	1 (0.6)
Relaxatabs	170	1 (0.6)
Palfium	170	1 (0.6)
Melleril	170	1 (0.6)
Tegretol/Lithium	170	1 (0.6)
Prozac	170	1 (0.6)

The proportion of multiple drug use, shown in Table B- 2, appears to be fairly low. Almost half the respondents used only one or no substances at all, whilst a marginally larger proportion had used two or more.

Table B- 2
Current (past 3 months) number of multiple substances used

No. of substances	**Current (n=173)**
	n (%)
0	29 (13.5)
1	50 (23.3)
2	43 (20.0)
3	27 (12.6)
4	10 (4.7)
5 or more	14 (6.6)
M (SD)	1.95 (1.6)

As shown in Table B- 3 and B- 4, three quarters of respondents were either not at all concerned (50%) or only reported having some concern regarding their current drug use (27.3%). Not surprisingly, well over half the respondents (61.5%) were not interesting in receiving help to reduce their drug use.

Table B- 3
Level of concern about drug use (n = 206)

Concern	**n (%)**
Not at all	103 (50.0)
Unsure	13 (6.3)
Some concern	56 (27.3)
Very concerned	34 (16.5)

Table B- 4
Clients wanting help reducing drug use (n = 205)

Help	**n (%)**
Yes	79 (38.5)
No	126 (61.5)

Appendix C: Management Committee

Tony Carmody

Bourke Street Drug and Alcohol

Steven Childs

St. Vincent's Hospital

Sue Cripps

Inner City Mental Health Service

Bronwyn Crosby

St. Vincent's Hospital

Ross Johnston

Langton Clinic

June Lewis

Haymarket Foundation

Dr Maree Teesson

Inner City Mental Health Service

Dr Peter Tucker

St. Vincent's Hospital

Appendix D: Inservice Timetable

Appendix E: Summary of the Multivariate Analysis of Variance

Summary of the Multivariate Analysis of Variance: Social functioning, HIV risk taking behaviour, BPRS(NM), tobacco, alcohol, and cannabis weekly use, and number of substances used for group (follow-up versus not followed-up)

EFFECT..Follow-up
Multivariate Tests of Significance (S = 1, M = 2 1/2, N = 10)

Test Name	Value	Exact F	Hypoth. DF	Error DF	Sig. of F
Pillais	.30857	1.40260	7.00	22.00	.254
Hotellings	.44628	1.40260	7.00	22.00	.254
Wilks	.69143	1.40260	7.00	22.00	.254
Roys	.30857				

Note.. F statistics are exact.

EFFECT..Follow-up
Univariate F-tests with (1,28) D. F.

Variable	Hypoth.SS	Error SS	Hypoth. MS	Error MS	F	Sign. of F
Social Functioning	11.7562	1704.5846	11.7562	60.8780	.1931	.664
HIV Risk	78.0023	1142.9642	78.0023	40.8201	1.9108	.178
Total BPRS(NM)	.5006	933.3660	.5006	33.3345	.0150	.903
Tobacco use	36121.488	390969.179	36121.4881	13963.18	2.5869	.119
Alcohol use	449.2420	33722.3984	449.2420	1204.371	.3730	.546
Cannabis use	99.8156	7984.3593	99.8156	285.1556	.3500	.559
No. of Substances	7.4666	38.0000	7.4666	1.3571	5.5017	.026

Appendix F: Summary of Backward Stepwise Regression Analysis

Gender, age, and illicit drug use on follow-up status (n = 71)

Dependent Variable:
Follow-up 0 No follow-up
1 Follow-up

Independent Variables:
Gender: 0 Female (n=20)
1 Male (n = 51)

Beginning Block Number 1. Method: Backward Stepwise (LR)

Variable(s) Entered on Step Number
1.. GENDER
AGE
ILLICIT DRUGS

Estimation terminated at iteration number 3 because
parameter estimates changed by less than .01 percent.

-2 Log Likelihood	89.468		
Goodness of Fit	70.434		
	Chi-Square	df	Significance
Model Chi-Square	8.945	3	.0300
Improvement	8.945	3	.0300

Classification Table for Follow-up

		Predicted		
		.00	1.00	Percent Correct
Observed		0	1	
.00	0	23	12	65.71%
1.00	1	11	25	69.44%
			Overall	67.61%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)
Gender(1)	.4962	.2922	2.8848	1	.0894	.0948	1.6425
Age	.0411	.0225	3.3450	1	.0674	.1169	1.0419
Illicit	-.1728	.3692	.2190	1	.6398	.0000	.8413
Constant	-1.6559	1.0103	2.6862	1	.1012		

Model if Term Removed

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
GENDER	-46.248	3.028	1	.0818
AGE	-46.543	3.617	1	.0572
ILLICIT	-44.844	.221	1	.6384

Variables(s) Removed on Step Number
2.. ILLICIT DRUGS

Estimation terminated at iteration number 3 because
parameter estimates changed by less than .01 percent.

-2 Log Likelihood	89.468		
Goodness of Fit	70.420		
	Chi-Square	df	Significance
Model Chi-Square	8.724	2	.0128
Improvement	-.221	1	.6834

Classification Table for Follow-up

		Predicted		
		.00	1.00	Percent Correct
Observed		0	1	
.00	0	21	14	60.00%
1.00	1	12	24	66.67%
			Overall	63.38%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig	R	Exp (B)

Gender(1)	.4850	.2911	2.7761	1	.0957	.0888	1.6242
Age	.0461	.0200	5.3203	1	.0211	.1837	1.0472
Constant	-1.9388	.8188	5.6073	1	.0179		

Model if Term Removed

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
GENDER	-46.301	2.913	1	.0879
AGE	-47.818	5.946	1	.0147

Variables(s) Removed on Step Number
3. GENDER

Estimation terminated at iteration number 3 because
parameter estimates changed by less than .01 percent.

-2 Log Likelihood	92.602
Goodness of Fit	72.760

	Chi-Square	df	Significance
Model Chi-Square	5.811	1	.0159
Improvement	-2.913	1	.0879

Classification Table for Follow-up

		Predicted		
		.00	1.00	Percent Correct
Observed		0	1	
.00	0	24	11	68.57%
1.00	1	14	22	61.11%
			Overall	64.79%

Variables in the Equation

Variable	**B**	**S.E.**	**Wald**	**df**	**Sig**	**R**	**Exp (B)**

Age	.0451	.0199	5.1414	1	.0234	.1787	1.0462
Constant	-1.6773	.7822	4.5983	1	.0320		

Model if Term Removed

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
AGE	-49.206	5.811	1	.0159

Variables not in the Equation

Residual Chi Square 3.091 with 2 df Sig = .2132

Variable	Score	df	Sig	R
GENDER(1)	2.8715	1	.0902	.0941
ILLICIT	.1055 1	1	.7453	.0000

Appendix G: Gemini Project Survey