ALCOHOL AND OTHER DRUG TREATMENT: PREDICTORS OF OUTCOME & ROUTINE MONITORING

Jan Copeland, Brian Rush, Amanada Reid, Nicole Clement & Andrew Conroy

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Alcohol and Other Drug Treatment: Predictors of Outcome and Routine Monitoring Systems.

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Jan Copeland*, Brian Rush#, Amanda Reid*,

Nicole Clement* & Andrew Conroy*

*National Drug and Alcohol Research Centre, University of New South Wales, AUSTRALIA

Centre for Addiction and Mental Health, Addiction Research Foundation Division, CANADA

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EXECUTIVE SUMMARY

This paper provides an overview of the issues relevant to the development of a treatment outcome monitoring system in New South Wales.

The Australian National Minimum Data Set is a new, ongoing mandatory data collection system across Australia that commenced collection in July 2000. Within the state of New South Wales, a joint project of NDARC and the NSW Health Department established a more extensive state-wide treatment data set that also began collection in July 2000. The next phase of the NSW project is the addition of a brief, generic treatment outcome module. This monograph is a review of the literature on the processes and predictors of alcohol and other drug treatment outcome, and the monitoring of treatment outcome. This and a previous NDARC Technical Report reviewing the available treatment outcome measures will form the basis of the recommendations for the content of a brief outcomes module.

Several large studies have established the efficacy of treatment for substance use disorders. Over the past 30-40 years the alcohol and other drug field has accumulated considerable experience with the evaluation of treatment. This cumulative experience has been synthesized many times in order to highlight knowledge being gained over time and to suggest ways the knowledge can improve both the theory underlying various treatment interventions, and the cost-effectiveness of service delivery. A common theme across these major reviews has been the call for better designed evaluations of outcome; that is the assessment of changes in clients' drinking and health and social functioning and the attribution of these changes to participation in treatment. Most of the knowledge we have gained about the treatment of substance use disorders has come from the evaluation of specific types of treatment *activities* (e.g., cognitive-behavioural therapy, pharmacotherapy, skills training), or treatment *settings* in which these interventions are delivered (e.g., inpatient versus

outpatient, hospital versus community versus home). We have also learned, however, that a community needs a mix of interventions in order to meet the needs of a heterogeneous population, and that it is helpful to plan services along a "continuum of care." This systems perspective to planning and delivering services has, in turn, increased the importance of evaluating the overall network of services that may be offered in a given jurisdiction.

Section 3 of the monograph draws the distinction between treatment research and outcome monitoring. Outcome monitoring is one of the predominant paradigms emerging within the broader frame of health services research. It has been described as a system that categorizes clients into homogeneous subgroups, establishes benchmark expectations of the services and outcomes for each group, then attempts to optimise a core set of outcomes by changing the process or services received." Each element of this definition is fraught with conceptual and methodological challenges to be overcome and these are discussed in turn.

Section 4 outlines the critical features that should be included in the design of any given outcome monitoring system acknowledging that funding has a large impact on design. The monitoring system must sort through the array of possible measurement variables and decide on specific measures to include as outcomes, or as control variables in the analysis, as well as those that allow the comparison of homogenous subgroups of clients. The importance of baseline assessment at intake, and a reassessment (after some nominated period of time) is highlighted. Integration of the clinical assessment and baseline evaluation information is discussed, and it is planned that the brief instrument intended for outcome monitoring in NSW be integrated into current practice.

Section 5 outlines the methodological details to be decided on when planning and

implementing an outcome monitoring system. These include:

- the addition of methods other than self-report to enhance the reliability and validity of outcome monitoring;
- method of selecting a sample of clients for follow-up from the whole treatment population, and the identification of the population of interest;
- size of follow-up sample needed in order to detect the size of differences between two groups on an outcome measure. This needs to take into account that only a proportion of the client population will consent to be followed up and that some of these may be 'lost' to follow-up;
- the timing and frequency of follow-up, including the start-date for the follow-up period, the duration of the follow-up interval, and the time period over which outcomes are assessed. A system for the successful follow-up of the maximum number of selected clients must also be decided; &
- other issues surrounding consent and implementation.

The choice of measures is critical to the success of an outcome monitoring system and is discussed in Section 6. It is widely accepted that a multi-measure approach is needed, although the choice of measures must be guided by the objectives that the treatment system is trying to achieve. Specific measures might be included for alcohol use, heavy alcohol use, and alcohol-related problems; drug use, heavy drug use and drug related problems; treatment utilization; crime and incarceration; employment/school problems; health and mental functioning; use of health and mental services; pregnancy and low-birth weight babies. In addition to the outcome measures, factors that help explain or predict outcome for certain groups of clients are also needed. Some measures may be used in one analysis as the outcome, and in

another analysis as the predictor. Important client factors to measure as predictors are: severity of dependence; family and social supports; and psychiatric symptoms; as well as client demographic data and treatment process data.

Other issues guiding the selection of outcome measures should include the total time to be invested in the baseline assessment process, the potential use of the computer to assist in information collection, established reliability and validity data, cost of using the instrument (if applicable), follow-up data collection strategy and resources available for data collection, analysis and interpretation of information.

Sections 7 to 9 examine predictors of outcome specific to alcohol, opiates, cannabis use and psychostimulant use disorders respectively. Some treatments may be more applicable to certain substance categories (such as maintenance therapies for opiate dependence), and therefore may present different predictors of outcome. There is no reason to believe, however, that a brief, generic measure of treatment outcome would not be equally applicable across treatment and drug types.

The final section outlines the ways outcome data may be linked to utilisation and costs information. The primary objective of the outcome monitoring system is the gradual improvement of outcomes through changes to the delivery of services. Implied in this objective is improved cost-effectiveness of services, and it is crucial to develop an information system that links data on service utilization, costs and outcomes for specific sub-groups of clients. The development of costing protocols for substance abuse services that are appropriate for a large scale monitoring system is a very new development. These protocols must collect information from both an accounting and a societal perspective. Comparisons between providers must take into account that different providers may service clients with different characteristics.

The establishment of system boundaries is one of the first steps in the design and

development of outcome monitoring systems. The boundary of the substance abuse treatment system can be difficult to determine, for instance many mental health services have specialized substance abuse counsellors. The substance abuse treatment services may be required to participate in a broader information system for mental health or broader health sectors.

The outcome monitoring systems described have developed largely in response to the failure of the traditional, clinical research paradigm in addressing the important questions that arise in delivering services along a continuum of care model. The future of outcome monitoring is filled with both facilitating factors and barriers. Outcome-based funding still meets with considerable resistance by some substance abuse providers. However, it is probable that there will continue to be a high level of demand for system-level evaluation and monitoring information.

In the Australian context, particularly in New South Wales, the ground is very fertile for the development of routine outcome monitoring. There have been significant increases in funding of alcohol and other drug services with a greater emphasis on accountability. Concurrently, there has been the introduction of the New South Wales Data Set that has standardised the collection of process data on clients. This has paved the way ideologically and logistically for the pragmatic collection of treatment outcome data as long as it is brief, valid and appropriate and firmly placed in the context of ongoing improvement of treatment processes.

1.0 INTRODUCTION

Over the past 30-40 years the alcohol and other drug field has accumulated considerable experience with the evaluation of treatment. This cumulative experience has been synthesized many times in order to highlight knowledge being gained over time and to suggest ways the knowledge can improve both the theory underlying various treatment interventions, and the cost-effectiveness of service delivery.[1-5] A common theme across these major reviews has been the call for better designed evaluations of outcome; that is the assessment of changes in clients' drinking and health and social functioning and the attribution of these changes to participation in treatment.

1.1 The Australian National Minimum Data Set of Clients of Alcohol and Other Drug Treatment Services

A National Minimum Data Set (NMDS) is a minimum set of data elements agreed by the National Health Information Management Group for mandatory collection and reporting at a national level. A National Minimum Data Set is contingent upon a national agreement to collect uniform data and supply it as part of the national collection, but does not preclude agencies and service providers from collecting additional data to meet their own specific needs.

In Australia, an ongoing data collection system commenced on the first of July 2000 as agreed by all States and Territories. This project was borne out of a national forum conducted in 1995 by the Alcohol and Other Drugs Council of Australia that examined barriers between research and practice within the alcohol and other drug (AOD) field. The aim of the project was to design a national framework for collection of consistent data across all treatment services.[6] This collection is known as the 'National Minimum Data Set on Clients of Alcohol and Other Drug Treatment Services (NMDS:CAODTS)'.

The objectives of the NMDS: CAODTS are to:

- monitor broad patterns of service utilisation;
- monitor access to services for specific population groups;
- inform planning and development of service delivery strategies; and
- support the development of benchmarking.

In 1998 The National Drug and Alcohol Research Centre (NDARC) developed and piloted, in consultation with treatment agencies, a set of data items for national collection. The NMDS:CAODTS became a joint project with the IGCD Working Group consisting of representatives from all jurisdictions, the Australian Institute of Health and Welfare (AIHW), NDARC, the Australian Bureau of Statistics (ABS), and the Commonwealth Department of Health and Aged Care. Development of the data elements for the National Minimum Data Set continued throughout 1999. In December 1999, the Commonwealth, and State and Territory Governments endorsed the current version of the NMDS:CAODTS and collection was agreed to commence on 1 July 2000. The specialist alcohol and other drug definitions developed for the NMDS-AODTS are included in the National Health Data Dictionary for use by other data collections.[7]

1.2 The NSW Monitoring and Outcomes Project

Within New South Wales, NDARC is involved in a partnership with the NSW Health Department – the Monitoring and Outcomes Project (MOP). The major goals of this project are to establish a state-wide treatment data set, and following this, to introduce the regular assessment of treatment outcomes using a brief outcome instrument. This project will provide data on the drug and alcohol services available, the utilisation of these services, client population profiles, treatment needs, the types

of treatment delivered and outcomes achieved. This information will serve to facilitate increased awareness and improved responses to relevant issues by the government, treatment and other health agencies, and the broader community. Collection of the NSW Minimum Data Set commenced on July this year. The data set being collected includes all of the data items agreed to nationally, as well as additional items to describe the treatment services being provided. Definitions of these data items are available in the Data Dictionary for Alcohol and Other Drug Treatment Services in New South Wales.[8] An abbreviated version of this dictionary with collection guidelines is also available for use by clinicians.[9] This formed the basis of the training of the area health service data co-ordinators and participating service providers. The items included in the NSW data set are set out below.

Data is collected at three points during the treatment episode:

- Items collected when commencing treatment
- Service contact dates, which are completed throughout the treatment episode
- Items collected at the end of the treatment episode

The intensity of treatment is reflected in the length of stay for residential agencies and the number of service contacts for non-residential agencies.

TABLE 1: CONTENT OF THE NSW MINIMUM DATA SET

Commencement of Treatment	Cessation of Treatment
Agency code	Cessation of treatment date
Agency Location	Reason for cessation of treatment
Client Code	Referral to another service
Date of birth	
Sex	
Indigenous status	
Country of birth	
Preferred language	
Principal source of income	
Living arrangement	
Type of accommodation	
Client status	
Principal drug of concern	

Other drugs of concern Method of use for principal drug of concern Injecting drug use Commencement of treatment date Source of referral to treatment Previous treatment Main service provided	
During Treatment	
Service Contact Dates	

1.3 Review of the Available Outcome Measures

The next phase of the MOP project is the addition of an outcomes module to complement the data collection. This would be consistent with the format of the NSW data and include amendments and additions as required. Towards this end a review of available measures of treatment outcome was conducted.[10] The search revealed over 300 instruments that were examined as possible outcome measures. Of those, 44 were selected for examination and review by two independent raters. These measures include those designed for and used in adolescent populations. The 44 measures reviewed covered the following areas: 'screening of problematic use and quantity/frequency', 'diagnosis of dependence/harmful use', 'relapse', 'functioning', 'multi-dimensional' and 'satisfaction with service'. Measures were reviewed in regard to their applicability, acceptability, practicality, reliability, validity and sensitivity to change. Four measures met minimum criteria for use as routine outcome measures: Addiction Severity Index (ASI), Health of the National Outcome Scale (HoNOS), Opiate Treatment Index (OTI) and Short Form-36 (SF-36). In conclusion, The Opiate Treatment Index, developed in Australia met more of the requirements.[11] It was recommended that it be revised and shortened for use as a routine outcome assessment tool suitable for use across the alcohol and other drugs field.

This Technical Report is a review of the literature on the processes and predictors of alcohol and other drug treatment outcome. Together these two reviews will form the

basis of the recommendations for the content of a brief treatment outcome module.

1.4 Defining Treatment Outcome1

In 1994 the Australian Health Ministers Advisory Council Health Outcomes Seminar agreed that 'a health outcome is a change in the health of an individual, or group of people or population which is attributable to an intervention or series of interventions'.[12] The key aspect of health outcomes as defined here is that *change* is attributable to the intervention used. For aggregate data the overall effect should be improvement. However on an individual basis the expectation of measurable change may be unrealistic for all people. For example, the outcome of detoxification treatment for a homeless adult withdrawing from opiates or alcohol may be markedly different from the outcome achieved with a young person detoxifying for the first time with the full emotional and financial resources of parents and family. A positive outcome of treatment for some individuals may be the maintenance of a given level of functioning rather than a measurable improvement in functioning. Accordingly it may then be more appropriate to think of and define treatment outcome as an *effect* on the health of an individual, group of people or population, which is attributable to an intervention or series of intervention.[13]

2.0 PATTERNS OF SUBSTANCE USE DISORDERS IN AUSTRALIA

It is important to understand the basic profile of the clients of alcohol and other drug services, in order to choose the most meaningful outcomes and measures for this group. Who are the clients to whom measurement of outcome should apply? What services are they accessing? Whilst clients with an alcohol or other drug problem cut through the entire spectrum of society it is helpful first to look at the extent of the problem in terms of the percentages of the population that will suffer from an alcohol

and other drug use disorder in any year.

The National Survey of Mental Health and Wellbeing can provide information on the nature and extent of substance use disorders in Australia. The National Survey of Mental Health and Well-Being (NSMHWB) was a nationally representative survey of 10,641 Australians.[14] Disorders were defined in terms of ICD-10[15] and DSM-IV diagnostic criteria.[16] The survey found that one in thirteen Australian adults aged 18 years and older (7.7%) had a substance use disorder in the past 12 months according to ICD-10 criteria. Males were about twice as likely as females to have a substance use disorder; 11.1% of males and 4.5% of females met criteria for the diagnosis of a substance use disorder in the past 12 months.

Substance abuse is a term that covers both abuse of alcohol and abuse of other drugs. The NSMHWB survey provides specific information on the each of these areas as follows:

2.1 Alcohol Use Disorders

A large proportion of Australian adults sampled (83% of males and 63% of females) reported that they had consumed at least 12 drinks of alcohol in the preceding year. One in fifteen (6.5%) met criteria for an alcohol use disorder in the past 12 months. Three percent reported harmful use (4.3% of males and 1.8% of females) and 3.5% could be classified as alcohol dependent (5.2% of males and 1.8% of females). A greater number of males than females had an alcohol use disorder within the past 12 months (9.4% versus 3.7% respectively).

1 The following sections, with minor modifications, are taken from NDARC Technical Report Number 92.

The majority of persons meeting criteria for alcohol dependence (96%) reported impaired control over their alcohol use, indicating greater use or using for longer than intended, or a persistent desire or unsuccessful efforts to cut down. Of those with alcohol dependence three in four persons (73%) reported tolerance to the effects of alcohol but only half (50%) reported having experienced either withdrawal symptoms from alcohol, or having used alcohol to avoid or relieve withdrawal symptoms.[17]

2.2 Other Drug Use Disorders

Of the other drugs used (cannabis, stimulants, sedatives and opioids), one in eight males (12.5%) and one in fourteen females (6.9%) reported that they had used at least one of these drugs more than five times in the past year. Cannabis was the most commonly reported drug in this class, used by 10.3% of males and 4.3% of females. Stimulant, sedative and opioid use was reported by 1.3 - 1.9% of males, and 0.6 - 2.3% of females.

About 1 in 45 persons were affected by drug use disorders in the past 12 months. An estimated 2.2% of the Australian adult population met criteria for a drug use disorder (0.2% with harmful use, and 2.0% with dependence) on at least one of these controlled substances in the last 12 months. Cannabis use disorders were the most common: 1.7% of the sample met criteria for a 12 month diagnosis of a cannabis use disorder. Sedative use disorders affected 0.4% of the study population, while 0.3% could be diagnosed with a stimulant use disorder. In addition 0.2% met criteria for an opioid use disorder in the past 12 months.

The NSMHWB, being a household survey, will be likely to under-represent the extent of heroin dependence (and dependence on illicit drugs in general) in the community. The NSMHWB estimated opioid dependence in the past 12 months as 0.2% or 2 per

1000. Hall and colleagues argued that "indirect estimates of the prevalence of heroin dependence produce higher estimates". These are provided by multiplying the number of dependent heroin users who are identified from a particular source by a factor thought to represent the ratio of known to unknown dependent heroin users. The most recent estimate of the number of dependent opioid users in Australia is 74,000 (range 67,000-92,000) based on a variety of methodologies.[18]

2.3 Psychological Comorbidity

Forty-eight per cent of females with an alcohol use disorder met criteria for an anxiety, affective or drug use disorder compared with 15% in the 'non-drug use disordered' general female population. One third of males with an alcohol use disorder met criteria for a mental health disorder compared with 9% in the general male population.

There is also a moderate degree of comorbidity between substance use disorders and other common mental health problems. According to the NHSMHWB 65% of females with a drug use disorder met criteria for an anxiety, affective or alcohol use disorder. These rates contrast markedly with the females without a drug use disorder of whom only 12% met criteria for a mental health diagnosis.

The figures were similar for males with 64% meeting criteria for a mental health disorder, compared with only 11% of men without a drug use disorder meeting similar criteria. Forty-two per cent of individuals with a drug use disorder had a co-morbid physical disorder.

2.4 Treatment Seeking

The NSMHWB found, as did the North American studies such as the Epidemiological

Catchment Area survey[19] and the National Comorbidity Survey[20], that only a minority of those who met criteria for an alcohol and drug use disorder had sought professional help for their condition (21% of women and 12% of men). Treatment seeking was related to gender, with females being more likely to seek assistance than males. Among those who sought help, general practitioners were the health professionals most likely to be consulted.

In other words the survey findings do not necessarily mean that 6.5% of Australian adults need specialist treatment for alcohol use disorders. Specialist treatment is one response that should form part of a general public health approach to reducing alcohol and other drug use disorders.[17] Public health policies that reduce the availability and increase the price of alcohol may also reduce the prevalence of alcohol use disorders.[21]

Screening and brief advice for excessive alcohol consumption in general practice and hospital settings has been shown to reduce consumption and the problems caused by alcohol.[22,23] Screening is of considerable importance for males who were unlikely to seek assistance in the present survey.[17] The focus of this report is not the measurement of the outcome of these public health approaches but rather the measurement of the outcome for individuals who seek specialist treatment. It is important to note that the efficacy of treatments have been demonstrated in the literature.

2.5 Treatment Effectiveness

Of those who have sought treatment for alcohol problems in the past, controlled evaluations have demonstrated that about a third of patients remain abstinent over a year, a third show reductions in their drinking, while drinking in the remaining third is

largely unchanged.[24]

Although the cost-offset of treatment is less often cited, there is also good evidence that treatment for alcohol dependence has a net economic benefit. Holder and colleagues[25,26] have shown a substantial reduction in health care expenditure of insured persons between the three years before and the three years after alcohol treatment. More recently new pharmacological treatments such as acamprosate and naltrexone have proven to be effective in preventing relapse in people with alcohol dependence.[27,28]

Several studies in both the USA and the UK, DATOS[29] CALDATA[30] and NTORS,[31] have established the efficacy of treatment for substance use disorders more broadly.

The Drug Abuse Treatment Outcome Study (DATOS) was a national community-based treatment outcome study conducted in the United States.[32] In this study 10, 010 individuals undergoing treatment were sampled. Of this total, 4229 were interviewed 12 months following treatment. Outpatient methadone maintenance, long-term residential treatment, outpatient drug-free treatment and private/public short-term residential treatment were the four major treatments offered. Significant reductions in most types of drug use across all treatments were recorded. Reduced crime and increased employment in the long-term residential treatment group and improved long-term employment and reduced suicidal ideation in the outpatient drug-free group were also found.

The California Drug and Alcohol Treatment Assessment Project (CALDATA) was another large scale pre-treatment post-treatment study of the effectiveness, cost effectiveness and overall economic value to society of drug and alcohol treatment in

America.[30] Three thousand and fifty five individuals were selected to participate in this study. These subjects were recruited from the following treatment modalities: residential programs, social model recovery houses, outpatient non-methadone, methadone maintenance, and detoxification (both residential and outpatient). 1859 individuals were included in a follow-up study on an average of 15 months following treatment. Reductions in drug use among 40% of subjects, a 17% improvement in self-reported health, and a decrease in hospitalisation were found. The study concluded that treatment is effective.

Recent data on outcome has also come from the United Kingdom. The National Treatment Outcome Study (NTORS) was the first broadly based study in the United Kingdom aimed at examining outcomes for primary illicit drug problems at multiple sites: specialist inpatient treatment, rehabilitation programs, methadone maintenance and methadone reduction programs. 1075 clients were recruited for this study, 753 of these were followed-up at one year following treatment initiation. At 12-month follow-up results indicated that clients in all treatment modalities had substantially reduced their use of illicit drugs. A number of improvements in both their physical and mental health were recorded, as was a substantial reduction in their involvement in criminal activity.[31]

Clearly treatment can be effective with this population. Studies such as those described above have shown that treatment services can work and providing effective treatment is undoubtedly crucial in order to assist people to recover from AOD use and their associated problems and subsequently reducing the burden of such problems to the community. However treatment provision is not sufficient on its own. Once treatment has been delivered it must then be evaluated in order to ensure that treatment is effective and that it is meeting the needs of the target population. Outcomes have been shown to vary accordingly to a number of factors, such as treatment modality, treatment population characteristics and environmental conditions. Consequently, evaluation is a component of good clinical practice - providing feedback to clinicians about their practices. Evaluation is also important, in order to truly gauge the relative cost effectiveness of such treatment services.

2.6 General Issues in Treatment Outcome Measurement

As outlined above, one of the main purposes of evaluation is to attribute client outcome to a treatment intervention. Measuring outcome in health is not a new concept. Traditionally there has been a tendency to measure outcome in terms of input and process. Quality assurance programs have often measured outcome by measuring the amount of treatment resources (capital and staff) provided (input) and the number of treatment occasions provided (level of service or process).[33] In other words an increase in the provision of resources has traditionally been equated with an improvement in the health of consumers. This is an erroneous assumption. [34]

Input and process cannot be ignored when evaluating outcome. It is important to improve processes and set standards for best practice, but this alone does not ensure a beneficial outcome. It is only by determining what effects on health and functioning the treatment aims to achieve, and then by measuring if such effects have taken place

as a result of treatment, that outcome can be truly gauged.

It is vital at this point to discuss the nature of health effects or outcomes that need to be assessed. Before this can be done it is important to note the difficulties involved in attributing change in an individual to the receipt/consumption of treatment.

There are three basic factors that can lead to the mistaken belief that an improvement in functioning occurred as the result of treatment. The first of these is called regression to the mean.[13] Regression to the mean describes an improvement that occurs as a normal fluctuation in the course of a disorder. Research has shown that disorders fluctuate. Individuals usually seek treatment when the symptoms of their condition are most severe, and so an improvement after treatment may simply have occurred without treatment, in the normal course of fluctuations in their health.

The second factor that can lead to improvement in functioning regardless of treatment is spontaneous remission.[35] Spontaneous remission occurs with some illnesses whereby the individual recovers due to non-specific variables that are not in any way related to treatment. These might include internal biological or psychological improvements, and/or changes in the person's social or environmental circumstances.

Finally the placebo effect can lead to an improvement in client functioning[13]. This is the general effect of receiving treatment, rather than a specific effect of a particular treatment. Receiving treatment, even a placebo can lead to a positive outcome in functioning, simply because the client is encouraged and becomes motivated to try harder to recover and report the expected gains.

Essentially randomised-controlled trials (RCTs) are the most stringent way of

controlling for, or at least minimising these errors which attribute change to treatment rather than the three factors actually responsible for the change (as outlined above). Obviously not all treatment can undergo such costly and labour intensive procedures as RCTs. Randomised controlled trials also bring limitations such as poor generalisability, since the treatment population is selected on the basis of strict inclusion criteria. This and other limitations of RCT's are discussed more fully below.

3.0 SYSTEMIC TREATMENT OUTCOME MONITORING2

As previously discussed, while many important questions remain unanswered, we are reasonably confident that participation in treatment is more effective than non-participation for the majority of people in need; that treatment returns more to society in economic terms than it consumes; and that some interventions are more cost-effective than others, at least for large unselected groups of clients. Most of the knowledge we have gained about the treatment of substance use disorders has come from the evaluation of specific types of treatment *activities* (e.g., cognitive-behavioural therapy, pharmacotherapy, skills training), or treatment *settings* in which these interventions are delivered (e.g., inpatient versus outpatient, hospital versus community versus home). We have also learned, however, that a community needs a mix of interventions in order to meet the needs of a heterogeneous population, and that it is helpful to plan services along a "continuum of care."[2] This systems perspective to planning and delivering services has, in turn, increased the importance of evaluating the overall network of services that may be offered in a given jurisdiction.

In general terms, a "system" is characterized by a set of connected, and

interdependent, component parts. The system exists to facilitate flow across these components. Further, systems usually exist within, and are connected to, other systems. A community treatment system for substance use disorders may be comprised of many different agencies and treatment settings. This may include both specialized substance abuse services, and a wide range of health, mental health, social and correctional services. Alternatively, a treatment system may be a mix of interventions and treatment units administered by one "provider", but through which a client moves according to an organized plan of care. Such a system is most formalized within the "levels of care" of a managed care program. This type of system is rapidly becoming the norm in the United States. In many jurisdictions, there is also a trend toward the merger of formally independent treatment units into larger administrative and programmatic entities. It is safe to say that many current groups of service providers do not typically display system-like characteristics. However, they are becoming increasingly more "networked", and the expectation of this reform effort is that system-like, organizational behaviour will emerge.

3.1 The What And Why of Outcome Monitoring

In defining outcome monitoring it is helpful to draw a distinction between: the short-term goals of treatment and the maintenance of these goals; ongoing monitoring versus treatment research. The influential Institute of Medicine (IOM) report on alcohol treatment encouraged the specification of short-term goals such as detoxification (when required), change in client attitude and self-efficacy, reduction or elimination of substance use and concomitant reduction in the signs, symptoms and consequences of substance use.[2] Outcomes, on the other hand, were said to reflect the maintenance of these goals over the longer term. The IOM report did not stress

[2] The following sections are based on a conference paper summarising a meeting held in Toronto that was presented by the second author at the 1998 annual meeting of the American Evaluation

any particular time frame as being necessary and sufficient to establish outcome; only that status at discharge was clearly insufficient. This and other reports,[36] also stress the distinction between outcome monitoring and treatment research, the latter being concerned with the comparison of a small number of very specific interventions or services, and preferably with randomised controlled trials or well- designed matching studies. These designs are intended to establish the causal relationship between the intervention or mode of service delivery, and a change in a client's substance use and/or functioning. Such studies address questions about the underlying theory or program model, and whether the intervention "worked" under the conditions of the experiment. That is, clinical treatment research addresses questions of treatment *efficacy*.

Outcome monitoring on the other hand is concerned with establishing whether the treatment experience of the client in the "real world" is associated with change. These studies do not prove that outcomes were caused by the treatment experience. They do, however, establish that improvement has occurred following treatment, and give much more attention to the heterogeneity of the client population, the multiplicity of potential outcomes and the complexity of the client's experience across many different services in which they participate. In short, outcome monitoring addresses questions related to the *effectiveness* of treatment as it is routinely delivered, and as it is experienced by the client.

There is a close relationship between the recent interest in outcome monitoring and the continuum of care model of service delivery, of which there are many elements. This includes the provision of a range of services; initial treatment assignment of the client based on a comprehensive assessment and application of matching or

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Society.

"placement" criteria; and planned movement of the client to other levels of care based on outcomes being achieved. The traditional, clinical research paradigm is quite limited in its ability to evaluate outcomes within this model of care. For example, the traditional model has typically yielded studies with low statistical power; unrepresentative samples; failure to measure or control for the variability in the client population or the treatment received; analytical strategies that fail to control for the offsetting effects of multiple outcomes; rules of inclusion and exclusion that severely restrict the generalisability of the results; and failure to address the fact that the intervention being evaluated is but one of many treatment experiences for the majority of clients.[36] The major conceptual flaw of the clinical evaluation paradigm is that it considers separate interventions and levels of care as *alternatives* to be selected from, rather than a series of components that may all be necessary for positive outcome. Thus, the clinical research model has significant limitations in deciding how to place and move clients between levels of care, and how best to work with long-term and chronic clients.

Health services research has proven to be a fruitful source of research and statistical models for evaluating clients, services being delivered, and organizational/financial issues as they occur within a community treatment system. Outcome monitoring is one of the predominant paradigms emerging within the broader frame of health services research. Dennis, Huebner and McLellan broadly defined health services research as "the study of actual treatment and intervention delivery under field conditions with all or most of the population to which it was intended to be generalized. This includes the study of characteristics, generalisability, need or barriers, effectiveness, and cost as they are related to service delivery."[37] Dennis and colleagues go on to define outcome monitoring as "a system that categorizes clients into homogeneous subgroups, establishes benchmark expectations of the services and

outcomes for each group, then attempts to optimise a core set of outcomes by changing the process or services received."[36]

Each element of this definition is fraught with conceptual and methodological challenges to be overcome. Client classification has been a longstanding issue in the substance abuse field but is absolutely essential in making valid comparisons across service providers, or levels of care, within a treatment system. Making comparisons without agreed upon client groupings, or "case-mix", yields the inevitable problem of "skimming" the best clients in order to maximize program outcomes. Benchmarks are a hallmark of continuous quality improvement (CQI) and performance-based evaluation, but are difficult to develop without routine and uniform reporting requirements across all services within a treatment system. Finally, the use of outcome data as one of the critical elements of the decision-making process regarding change in service delivery requires strong political and administrative will, and must recognize the many competing perspectives and influences that often limit the utilization of evaluative information.

Outcome monitoring is recommended as a complementary strategy to enhance and extend knowledge gained from experimental and quasi-experimental clinical treatment research.[2] Outcome monitoring has also emerged as a meeting ground for health services researchers, funders, planners and managed care providers, program administrators and staff, and clients involved in the planning and delivery of their services. It can, however, be a very uneasy meeting place and many of the issues that arise in planning and implementing an outcome monitoring system reflect the competing needs and perspectives of these various stakeholders.[2]

3.2 The Costs and Benefits of Outcome Monitoring

The ongoing monitoring of client outcomes is itself a cost to the service delivery system. This begs the important question of accountability and the overall cost-benefit of the monitoring system itself. In assessing the accountability of the outcome monitoring system, it is necessary to examine and prioritise the different expectations of the various stakeholders involved in system development. A monitoring system may fulfil the needs of one or more stakeholders very well (e.g., the funder), but fail to meet the needs of others (e.g., the treatment system administrator or individual service provider). Deciding whose information needs are most important will have a major impact on system design and overall cost. The rationale for implementing an outcome monitoring system is grounded on four overlapping, but sometimes competing, perspectives:

- quality of care;
- program and treatment system accountability and resource allocation;
- internal program and treatment system quality improvement; and
- health services research.

3.2.1 Quality of care

The IOM report makes the strongest case in the published literature on the need for outcome monitoring as a critical component of quality health care.[2] There are two elements to the argument. Firstly, a necessary feature of quality care of a health problem, especially a chronic, relapsing problem, is the clinical follow-up of client status. The relevant quote in the IOM report rings clear: "Quality means did the patient get better".[38] Clinicians have long been concerned about treatment outcomes and, although they should be encouraged to establish clear plans for follow-up of their clients, there are good reasons not to rely solely on clinical follow-up for purposes of

monitoring outcomes for the program as a whole. These reasons include limited focus on the shorter-term goals of treatment; potential bias introduced by the clinician hoping to show positive outcomes of their work; respondent bias through fear of disappointing their therapist with poor progress; the high proportion of clients lost to follow-up without a systematic and resourced effort to find them; and selection bias since those who have improved the least are probably less likely to follow through on follow-up appointments. A comprehensive outcome monitoring system obviates many of these problems while still providing the opportunity to check on client status, and advise on recontact with their therapist if indicated. The number of people still experiencing problems and returned to the treatment system, and the cost savings from this return to treatment, can be used to evaluate the cost-benefit of the monitoring system itself. This is part of the evaluation plan, for example, in the Illinois, USA monitoring system.[36]

The second reason for including outcome monitoring as a routine element of the care package is that a treatment which is generally effective may nonetheless prove harmful to some individuals.[2] An ethical obligation exists to monitor outcome to ensure that treatment has not produced deleterious effects. Such an obligation is consistent with the principle of *primum non no cere* - the first duty of the treater is to do no harm. There may in fact be serious legal ramifications for failing to check client status in the event that adverse effects have been overlooked or ignored. Both elements of this quality of care perspective impact significantly on decisions about following-up a *sample* of clients versus the *total* client population. The issue of sampling was hotly debated by the IOM committee. In the end it was left to those funding and administering outcome monitoring systems to assess the system's role in the actual delivery of care itself, and the importance of the ethical obligations of *primum non no cere*.

3.2.2 *Accountability and resource allocation*

The second part of the rationale for outcome monitoring concerns system accountability and resource allocation. Issues related to accountability beg the question: accountable to whom, and subject to what initial expectations of treatment? McLellan and colleagues[39] have described reasonable expectations for "effective" treatment. Expectations vary across the people who have an interest in specific programs or the overall system of services. This includes clients as well as others affected by substance abuse. In planning an outcome monitoring system, it is important to discuss and prioritise these expectations in the context of accountability requirements.

With respect to clients, some expect immediate relief from the acute and often painful symptoms of withdrawal, craving and loss of control that they are experiencing. Other clients, especially those pressured into treatment, may not be aware that they have a substance use "problem". They expect that an effective intervention will resolve the short-term social and personal problems that have led to their contact with a program. Still others are quite aware that their substance use is excessive and is preventing them from functioning effectively in family, work, and/or social relationships. Many of these clients have tried several times to gain control of their substance use and are expecting to make long-term improvements in many aspects of their lives. Other people who are directly or indirectly affected by the client's substance use have their own legitimate expectations of treatment. This includes family members who expect an end to the stress, disruption, and violence often associated with alcohol and drug dependence. Employers are particularly concerned with work performance and safety for others in the workplace. Police, probation/parole officers, and other representatives of the criminal justice system are

acutely aware of the link between crime and substance use and expect treatment to result in a reduction in crime and rates of incarceration.

Government departments, health insurers or health care delivery organizations that pay for substance use treatment expect that it will reduce the health and social risks associated with substance use disorders. From a financial perspective, it is expected that treatment will reduce the disproportionate use of expensive health care services. Finally, the views of members of the general public are highly idiosyncratic and they may expect all of the above benefits, or any combination that reflects their personal experience and values. Above all, the public expects treatment services to be delivered in the most cost-effective manner, and by people adequately trained to do so.

In summary, the "effectiveness" of treatment for substance use disorders from an accountability perspective must be measured not only in terms of reduced alcohol and drug use, but its impact on a wide range of other personal, public health and safety concerns. A monitoring system must, however, go beyond the basic *description* of such outcomes achieved, and focus also on the use of this information for planning and resource allocation. It can be argued that accountability is only truly achieved through a funding mechanism dependent, at least in part, on the achievement of positive outcomes. While outcome-based funding has potential pitfalls requiring careful attention (e.g., skimming of easy-to-treat clients without a pay differential based on case mix; potential fabrication or biasing of outcome data) the arguments are strong enough to develop and evaluate alternative models.

For example, Bickel and McLellan[40] propose a competitive ranking system based on outcome performance. Each program would compete for funds on the basis of its

demonstrated outcomes. These statistics would be provided to an oversight agency each quarter with the outcome data appropriately adjusted to account for the severity of the client population being treated and the unique services they provide. For example, detoxification services would not be assessed against the same outcomes as assessment services or treatment programs. The oversight agency would rank the programs quarterly (or as often as data are available) and inform them of their standing. By providing treatment programs with feedback during the year, steps could be taken quickly to improve program performance. Each fiscal year, the money distributed to the programs would be in proportion to their demonstrated outcomes. For example, the top 25% could receive budget increases to expand their programs, reward counsellors, and/or add innovative programs. Programs in the bottom 25% would receive proportionately fewer resources and would have access to remedial strategies through the oversight agency. Programs in the middle would receive no change in their budget, but would have a clear incentive to move into the upper 25% next year and to keep from dropping into the bottom quartile. In areas where competition is limited in the beginning, the oversight agency could also provide start-up funds for new, innovative programs based on research findings.

3.2.3 *Program and system improvement*

Whether or not one fully adopts an outcome-based funding formula, the results from outcome monitoring systems are certainly intended to guide changes in service delivery processes and structures. Thus, the development of these systems is clearly tied to the "quality revolution" that has swept health care administration over the 1990s. The customers of health care services - clients and their families, government and other funders, are demanding more information regarding the effectiveness of the services they are about to receive and/or pay for. In addition, in the face of shrinking health care dollars, the cost of poor quality is of concern to all health care

providers. Cosby,[41] estimated that 15-25% of every health care dollar is spent on the cost of work that is of poor quality. This includes duplication, waste, variation in practice and lack of incentive to control costs. The use of ongoing information systems to provide information on "performance indicators" is an important component of Continuous Quality Improvement (CQI)[42, 43]. This includes, but is not restricted to, information from outcome monitoring systems.

Most of the literature on CQI comes from the hospital sector and has been developed in the context of the "system" of services provided within a hospital organization. However, the same principles apply when considering the role of outcome monitoring across a continuum of substance abuse service providers, whether this be through one administrative organization or separate agencies. These principles include: a focus on customer satisfaction; accurate measurement of activities and outcomes; continuous improvement of products and processes; and empowerment of people.[44]

The first and last principles raise particular issues for outcome monitoring. The focus on client satisfaction is important but it is widely recognized that client satisfaction is an intermediate outcome and may not be a reflection of actual changes in client substance use or functioning. The relative importance of client satisfaction versus longer-term outcomes in making improvements to service delivery is not universally agreed upon by strong proponents of CQI, and other stakeholders involved in the design of outcome systems. Most systems being developed in the substance abuse area have an important role for client satisfaction, but it is to complement not replace the determination of outcomes. Further, there are many dimensions to client satisfaction, and some measures provide very global indicators, while others are quite specific to the individual program or system being monitored.[45] The latter are more useful for making decisions to change specific elements of the program or treatment

system, but may not be feasible to collect in a system-wide information system. Further, the selection of measures of client satisfaction is not a trivial task and some measures are clearly superior to others in terms of reliability and validity.

The issue of "empowerment" relates primarily to the role of staff and clients in system design and ongoing improvements. It is especially problematic in the development of outcome monitoring systems because the strategies to achieve this may not be consistent with the accountability objectives of the funder of the treatment system, who is also likely to be the funder of the monitoring system. In the world of CQI, the clients and staff of a particular organization are intensely involved in the development of benchmarks, identification of system inefficiencies and processes to improve service delivery. The ability to achieve a similar level of involvement decreases as the monitoring system extends across independent service providers. It is common, however, to actively involve some representatives of service providers in system design and implementation. This is typically an administrator or program manager with support from technical staff. The meaningful involvement of front-line therapists and clients should be a priority if outcome monitoring is to truly serve a CQI function for the system as a whole, and within each of the participating providers.

Dennis and colleagues[36] provide a comprehensive view of how the design of a large-scale outcome monitoring system can be closely integrated with strategies for system and program improvement. This involves careful consideration of the CQI requirements of both the system and individual providers. The approach included, for example,

- extensive involvement of the service providers in system design and the selection of the outcome measures;
- seamless presentation of the baseline measurement and follow-up interviews as

part of the care package and not a separate research process;

- predefined levels of care and placement criteria and an *a priori* data analysis plan to monitor the effectiveness of these criteria and make adjustments;
- priority given to establishing case mix to make fair comparisons across providers and over time;
- full integration of the CQI and accreditation checks for treatment planning; comprehensive measures of client satisfaction (global and specific); and
- well-defined performance indicators and simplified reports for use by managers and staff.

Performance indicators may include, for example, average time from the service request to assistance; percentage of clients receiving the level of care recommended at the time of assessment; and the percent of cases in which available family members are involved.

Finally, a cautionary note is warranted. Since we know that only a small percentage of people with substance abuse problems are seen in the specialized treatment sector, one can legitimately question why the outcomes of only those who are engaged in treatment should determine planning to such a large degree. We need much more information about those who do not seek treatment, what their needs are and how the system should be adjusted to make it more attractive and accessible. It is possible that the system as currently organized, and the treatment services made available within it, are quite far removed from the needs of the majority of people with substance-related problems.

3.2.4 *Health services research*

While a health services research agenda is not driving the development of outcome monitoring systems, the research community is clearly a major stakeholder in system design and utilization of the results. Some monitoring systems have been funded and

developed under the rubric of health services research (e.g., California Drug and Alcohol Treatment Assessment (CALDATA),[46] Drug Abuse Treatment for AIDS-Risk Reduction (DATAR)[47]). The research community is typically called upon to recommend outcome measures and data collection and analysis procedures. While it is beyond the scope of this report to fully explore the research potential of outcome monitoring systems, it is important that they be established following key principles of design, measurement and analysis. In addition, the development and design specifications of an outcome system should articulate the kinds of research questions that can and cannot be addressed with the resulting database.

Without built-in control or comparison groups, the proponents of outcome monitoring systems need to be very cautious not to overstate the ability of the system to attribute program participation to any changes that are measured. With both baseline and follow-up measures, a monitoring system does a good job at assessing change and the relationship between treatment "dosage" and this change. As well, sophisticated statistical methods can help control for some confounding variables and strengthen arguments that the intervention can take some of the credit for the change. The benefits of such statistical modelling notwithstanding, the fundamental rationale underlying outcome monitoring is *not* the attribution of causality. Rather the purpose is to benchmark expected change as an indicator of program performance and assess factors associated with deviation from the benchmark. The major issues from a design perspective are the need for both baseline and follow-up measures and the time period over which outcomes can be monitored; the latter having significant implications for resources required and potential biases due to attrition.
Outcome monitoring studies further our understanding of many aspects of the treatment process and outcomes achieved. For example, they provide fruitful ground for the study of the organization and inter-relationships among treatment services,

especially through cross-jurisdictional comparisons. The data can provide insight into the relationship of various client characteristics, treatment processes and outcome that can be further explored in more controlled research designs. Data from monitoring systems can be analysed in concert with population survey data from the same jurisdiction and further our understanding of the help-seeking process and factors related to not seeking care. They also help us understand the many pathways into substance abuse treatment, and the natural history and "treatment career" of individuals with chronic problems. Finally, through record linkage, the results of monitoring studies can be used to better understand the relationship between substance abuse, the participation in treatment, and mortality and morbidity. For example, either through record linkage or client self-report, a strong case can usually be made for the cost-offset of substance abuse treatment through reduced health and social service utilization.

Outcome monitoring systems are legitimate objects of research in their own right. For example, Dennis and colleagues[48] are currently assessing the value of outcome monitoring as a way of returning people to treatment who have relapsed. This is being tested through random assignment to outcome monitoring with or without an early reintervention protocol intended to get people back into treatment. There is also a largely unexplored area of research related to the application of the results from outcome monitoring in the context of organizational behaviour and decision-making processes. This research can be tied to the growing literature on evaluation utilization.[49]

4.0 WHAT ARE THE CRITICAL FEATURES OF SYSTEM DESIGN, OUTCOME MEASUREMENT AND DATA COLLECTION?

At the Toronto meeting on outcome monitoring in February, 1997 one of the

objectives expressed at the outset was to assess the feasibility of developing guidelines or "minimal standards" for the design of these systems based on the collective experience to date. As the proceedings unfolded it became increasingly apparent that a significant determinant of system design was the amount of funding available to finance the monitoring activity. Keeping in mind that the participants were all from developed nations, the relationship between funding and system design would be even more apparent when discussing feasibility of a comprehensive outcome monitoring system in a developing country. While it was not possible at the conclusion of the Toronto meeting to recommend a standard approach based on the experience of the participants, there was agreement on the need for some common elements to adequately benchmark costs and outcomes across jurisdictions.

The published literature offers some recommendations on the minimal criteria for outcome determination. Most relevant are the discussions of outcome monitoring in the report from the Institute of Medicine[2], and a recent paper on outcome evaluation by McLellan and colleagues.[39] In addition, there is a wide literature to draw on concerning methodological issues in outcome evaluation,[50-52] keeping in mind that this literature has been developed primarily from the perspective of the traditional, clinical research paradigm. The following discussion of critical features of outcome monitoring systems is presented while recognizing the early stage in the development of these systems internationally. While some features are more important than others (e.g., both baseline and follow-up assessment; use of key outcomes), no one feature was deemed to be either necessary, or sufficient, to have a system of high quality. The quality of the monitoring system should ultimately be assessed by its ability to meet the information needs of funders, administrators and other key stakeholders such as health service researchers.

4.1 The Treatment Experience

In their assessment of the limitations of the traditional clinical research paradigm, Dennis and colleagues[36] emphasize the critical need for outcome monitoring systems to address *chronicity*, *comorbidity*, and the complex *pattern of service utilization* of many clients across services and other support systems. The chronic nature of substance abuse problems is well-documented in the research literature. An important aspect of this natural history is the movement of clients in and out of treatment. Thus, a monitoring system must be able to track clients' movement through the network of providers or programs bounded by the system. This may be done with unique client identifiers developed for the monitoring system[e.g.53] or with health card/health insurance numbers. This may raise specific ethical issues in a given jurisdiction. Even with informed consent for a follow-up from a specific program, clients may need to be informed of this potential for tracking across providers, and other health databases. Measures of service utilization within the treatment system are usually reduced to variables like days in residential care and hours of different types of contact on a non-residential basis (e.g., assessment, counselling). Fortunately in Australia we now have standardized definitions of these non-residential service categories. However, these indicators have limited power in describing the treatment process, and explaining outcome in a way that system/program administrators and managers can use to make meaningful adjustments to service delivery. While utilization data such as hours of care are more useful to higher- level decision-makers (typically wanting to limit unnecessary time in treatment), indicators such as bed-days and hours of service say little, if anything, about what occurred during this the treatment experience.

Dennis and colleagues[36] discuss the distinction between specific and non-specific services, the former being services like methadone dosage, hours of counselling, days

of inpatient care. Non-specific services include such things as the communication, empathy and motivation of the therapist, and the quality of relationships established with other clients in treatment. While it may be very difficult to capture these predictive factors in a large scale monitoring system, they can be explored in periodic studies of the treatment process.

In an outcome monitoring system implemented by Simpson and colleagues[47] considerable attention is given to monitoring treatment process variables and their effect on program retention. Their work shows that while the detailed measurement of treatment process significantly increases the scope of the data collection effort, the payoff comes with having richer predictive variables to explain outcomes achieved. In establishing the relationship between service utilization and outcome it is necessary to expand the analysis to treatment "episodes" across levels of care, or separate service providers. There is no widely accepted definition in the field of health services research for a health care episode. The NSW Treatment Data Set has defined a treatment episode as "a period of contact, with a defined date of commencement and cessation between a client and a provider or team of providers that occurs in one setting". Additionally, it was specified that within a treatment episode there is no major change in either the goal or the main service being provided.[9] A national definition of episode of care will collected from 1 July 2001. It is of interest to examine the pattern of transitions for different client sub-groups to see, for example, whether re-admissions can be predicted. Also, multivariate analyses can examine the relationship between these transitional and episodic patterns and client outcome.

The outcome monitoring system must also recognize and measure the complex array of problems that often exist concomitantly with substance abuse problems. This includes

comorbid psychiatric diagnoses, health problems, high risk behaviours, environmental and coping problems, illegal activity, violence and victimization, vocational problems at work/school and gambling. The monitoring system, and the data analysis plan, must sort through this array and decide on specific measures to include either as outcomes, or as control variables in the analysis. In addition, there must be a carefully developed data analysis plan to create relatively homogenous subgroups of clients, for whom utilization and outcomes can be predicted and compared. For example, where two individuals receive the same intervention in the same setting, their outcome may be differentially influenced by factors such as their age, level of dependence or level of social support. These factors must be taken into account in any assessment and comparison of treatment outcome across treatment settings.

Having assessed this extensive comorbidity, the monitoring system must then deal with the interaction between comorbidity and the use of other health and social services. Data on the utilization of other health, social and legal services are essential for the economic analysis of the cost-benefit of treatment. As noted by Dennis and colleagues[36] the common pattern is that of a "utility curve", with an increase in basic services producing large changes, with increases above a certain level producing diminishing, though positive, returns. However, the converse is also probably true, in that cuts being made to basic services, such as increasing caseloads and reducing days in treatment, may produce a large increase in other costs that offset short-term savings in direct costs.[54] Given the important policy and funding implications of such a pattern, it is essential that the monitoring system be able to track the required data elements.

4.2 Evaluation Design

The general literature on outcome evaluation[55] describes various designs for outcome

assessment. This includes randomised controlled experiments, various types of quasi-experimental studies, pre-post and posttest-only designs. Since an objective of the monitoring system includes the measurement of change, one obviously requires a baseline assessment at intake and a re-assessment after some period of time has lapsed. In order to properly evaluate client placement criteria, assessments with a core set of outcomes should also occur at each transfer to another level of care. If the overall system design is based only on post-treatment information about client status, no statements can be made about client change, other than those based on client or collateral report of improvement in various domains. The IOM report[2] argues very strongly for both pre-and post- treatment measures. Other opportunities should also be explored for periodic, randomised or quasi-experimental studies, drawing samples from the overall client population.

When collecting the baseline information from clients, one must consider the need to integrate the clinical assessment measures and processes (i.e., needs) with the baseline evaluation measures and processes (i.e., outcomes).[56] A wide spectrum of options is possible, ranging from complete separation to a seamless integration. The former can send an inappropriate message to clinicians and their clients that program evaluation and monitoring is a separate "research" function. On the other hand, full integration of the clinical assessment and baseline evaluation information sends a strong message about the role of outcome monitoring as a critical component of the process and overall agency operations. This is more consistent with the principles of Continuous Quality Improvement.

The need to integrate the outcome measures into the baseline clinical assessment raises the issue of how to keep client time to a minimum, and make the initial assessment as efficient as possible from the client perspective. This often requires

that some forms and questionnaires used historically for assessment purposes be discarded in favour of evaluative instruments that may have stronger reliability and validity data. This typically results in a debate about the research versus clinical value of particular instruments. While there are varying opinions on the maximum time for assessment, baseline interviews for treatment planning and evaluation purposes are usually kept to within one to one-and-a-half hours. In Australia this issue was addressed in the collaborative development of the NMDS-CAODTS which standardised the definitions of existing data items nationally. [6] By building a brief generic outcome measure onto an existing baseline data collection system, in consultation with service funders, managers and clinicians, we hope to integrate the data collection into current practice and keep it brief enough to ensure collection of high quality data.

5.0 DATA COLLECTION STRATEGIES

Beyond the basic design of the monitoring system there are other methodological details to be decided when planning and implementing an outcome monitoring system. In this section, the following issues are briefly discussed:

- self report
- selecting cases for follow-up;
- sample size;
- timing and frequency of follow-up;
- obtaining informed consent and locating clients;
- conduct of follow-up interviews; and
- selection and training of interviewers.

5.1 Self-report

The reliability and validity of self-reported drug use and other measures of treatment outcome is frequently raised. A general review in 1998 of the reliability and validity

of self-report among injecting drug users concluded that self-report of drug use has respectable reliability and validity when compared to biomarkers, criminal records and collateral interviews.[57] Despite this, the use of truly random urinalysis on a routine basis will necessarily add significantly to the reliability and validity of a treatment outcome monitoring system, as well as being useful clinically.[58,59,60] Making use of urine toxicology as an outcome measure will increase the cost of the monitoring system. However, clinical trial research indicates that sometimes more urine samples are analysed than are needed, in order to provide essentially the same information.[61] Another issue is that urinalysis procedures need to take into account the substance in question, for example, cocaine use patterns can differ from opiate use patterns. Therefore, if planners of an outcome monitoring system decide to include urinalysis as an outcome measure, decisions must also be made regarding the details of collection and analysis procedures, which can vary in cost impact. The validity of urinalysis is affected by the randomness of its application. Where participants can predict when their next urinalysis will be performed it is no longer a valid measure. For this reason, hair analysis may be more appropriate, although the cost is markedly higher.[62,63] While hair analysis may provide a larger testing window its utility is affected by the client cutting or chemically treating their hair in the testing period.[64]

5.2 Selecting Cases For Follow-Up

There are a number of ways that existing and proposed treatment outcome monitoring systems internationally manage this issue. Unless the treatment population is small, or the resources available for client follow-up very substantial, it is necessary to follow-up a sample of clients rather than the whole population. It is critical to be able to generalize the results to the overall client population, and possibly to all clients falling within particular sub-groups. The strategy for sample selection as well as sample size, are important. To satisfy requirements for accountability, random samples should be

taken of *all* clients who enter treatment across the treatment system in a given time period. Clients may be stratified on the basis of client and/or program characteristics (e.g., male/ female, primary drug or alcohol problem, program or level of care). Many monitoring systems take a systematic random sample from all programs (e.g., Illinois, Minnesota, USA), while others first take a random sample of programs, and then a systematic random sample of clients. A variety of options are possible and the strategy must be guided by the specific objectives of the monitoring system in a given year.

Many treatment programs provide services to family members of people who have a substance use disorder. In some programs, family members provide information, support and encouragement to the actual client in the program. Increasingly, substance use services have adopted a formal mandate to provide assistance to family members as clients in their own right. In this latter situation, the evaluation of outcomes of services provided to family members is as legitimate as assessing outcomes of clients who have a substance use disorder. In this case, the sampling procedure would also involve a random sample of clients with a substance use disorder, and a random sample of family members. However, outcomes to be monitored for family members will be clearly different.

5.3 Sample Size

There are no simple answers to the question "How many clients need to be followed-up?" Much depends on the objectives of the study, the kinds of clients involved and the kinds of measures used. If the aim is to compare outcomes across two or more groups of clients (eg., males and females; three program categories), the number to be followed-up depends on the size of difference you want to detect between the two groups on the outcome measures. It is important to have the advice of a

competent statistician.

When planning the number of people to be followed-up in an outcome monitoring system, allowance must be made for clients who cannot be located, and for whom outcome information will be missing. The result of the sample size calculations is the final number to be interviewed. More will have to be contacted in order to get this many interviewed. The percentage of clients "lost" to follow-up will vary from situation to situation. It depends to some extent on the social stability of clients in the treatment system, the ingenuity of follow-up workers and the resources available for implementing various strategies. While some monitoring systems achieve a follow-up rate of approximately 90%,[36] McLellan and colleagues recommend a 70% follow-up rate as the minimum standard for outcome evaluation.[39] The Australian experience is a little less than this at around 65% for clients of drug-free interventions, the group who prove the most difficult to follow-up.[65] Thus, it may be reasonable to expect that up to 35% of cases chosen for follow-up cannot be traced and to increase the sample selected for follow-up by 35%.

5.4 Timing And Frequency Of Follow-Up

There are three factors to consider here:

- the point in time at which one starts the calculation of the follow-up interval (i.e., at intake and assessment, after some period of treatment participation, last treatment contact or formal discharge);
- the duration of the follow-up interval; and
- the time period over which alcohol and drug use and other outcomes are assessed.

5.4.1 Start date

In selecting the start date for the follow-up period there are several trade-offs to be made. It is widely recognized that most clients who drop-out of treatment do so early in the treatment process; many after their first contact. If it is decided to follow-up a random sample of clients who have completed intake and assessment, this will yield the largest sample. Results can be generalized to all clients who have participated in the program regardless of the level of service eventually received. This yields an important advantage since one can see if clients who participate in only the intake and assessment process do worse than clients who continue into the formal treatment process itself, and who eventually receive more treatment. On the other hand, selecting the sample this early in the process will probably mean more effort is needed to find people for follow-up since the early drop-outs will likely be more difficult to locate.

If one selects the follow-up sample from those who are completing a certain period of treatment, or who have made a certain number of contacts (e.g., three outpatient visits), the result will be a more stable group to re-contact. However, the opportunity will have been missed to determine outcome for those with very few contacts. Finally, if only those completing treatment, and who are formally discharged, are contacted, the final sample will probably be heavily biased toward positive outcome. McLellan and colleagues[41] refer to this as the "intent-to-treat" design and recommend it as a minimum standard for outcome evaluation. Following this approach means that the baseline evaluation information must be collected as early as possible in the intake/assessment process. This is the approach adopted for integrating the brief treatment outcome module to the NSW treatment data set in this proposed collection.

5.4.2 Duration of follow-up period

The second major decision with respect to follow-up is the duration of the follow-up interval. Common practice in outcome monitoring systems is to use a three, six, or 12 month interval. Some systems include multiple follow-ups with the results analysed separately for each period, and also aggregated to summarize changes over the full follow-up period. Outcomes determined at multiple follow-ups require special analytical procedures. The timing of follow-up will have a significant impact on the results and conclusions. Short-term follow-up studies will show better results than longer-term ones, since research shows that 60%-80% of "relapses" occur in the first three to four months following discharge.[66] Results will of course depend on the type of outcome being assessed. For example, changes in drinking and drug use may not be stable, but long-term improvements to family functioning may occur. At least a six-month follow-up period is recommended with careful consideration of at least one additional contact in another few months.

5.4.3 Time period for measures

The third major decision concerns the time period over which outcomes will be assessed. For example, even though the follow-up period may be six months in duration, one must decide the time period over which clients will be asked to recall their drinking and drug use, health service utilization, etc. The same time period must be chosen for both baseline assessment and the follow-up interview. A client's substance use in the 30 days prior to starting treatment may not be representative of longer-term drinking and drug use. Thus, comparison of the 30-day pre-treatment period and a 30-day post-treatment period may not yield a reliable and meaningful difference. On the other hand, if the time period is too long (e.g., 4-6 months) this will influence the client's ability to recall important information accurately (e.g., frequency and quantity of substance use; use of health and correctional services). In

addition, the period selected will determine the proportion of clients still engaged in treatment or continuing care, and this must be taken into account in the data analysis and interpretation.

A 90-day period is recommended for outcome measurement, and this time period will need to be clearly reflected in both the baseline and follow-up measures. This will influence the choice of measures since many instruments that are available ask about outcomes over a longer or shorter period. Existing instruments may need to be modified and this can have implications for the reliability and validity of measures. A number of the items in the NSW Treatment Data Set are consistent with the 90 day time frame already and the remaining items will need to be modified for those services participating in the outcome monitoring phase.

5.4.4 Obtaining informed consent and tracing clients

Clients selected for follow-up should be asked to sign a written consent form that explains the purpose and methods of the follow-up procedures. This is consistent with the requirements of the relevant legislation in New South Wales. The consent form should indicate the reason for following up clients, the (random) process of selection, assurances of confidentiality, the timing of the follow-up and the types of questions to be asked. It should also indicate that the client has the right to decline to participate and that their decision will not influence current or future participation in treatment. The form typically records the client's name, address and telephone number, and asks for details of other people who may be contacted to assist in locating the client. It is important to know if follow-up workers can, if necessary, identify themselves to others who may respond to the follow-up contact.

In outcome evaluation monitoring systems it is common practice to ask all clients to

complete the consent form at intake, and then take a random sample of those who agree. This is a safeguard against program staff knowing the clients selected for follow-up and changing their normal therapeutic behaviour. The consent form should accommodate the special circumstances of young clients whose right to consent to treatment and evaluation may need to be endorsed by parents or guardians. The legal requirement to obtain consent from parents or guardians will vary across jurisdictions.

The most elaborate system for follow-up in a large-scale monitoring system is described by Dennis and colleagues.[36] Their method consistently yields follow-up rates of 90% or higher. In consultation with other health service researchers, Dennis and colleagues recommend the following strategies, and many have been incorporated into their follow-up system. Their recommendations include:

- a locator staff and infrastructure, including strategies such as a toll-free line for respondents to use and "caller ID" to see the number of the caller;
- a CD Rom version of the national telephone directory to verify addresses; a tracking database system; and centralizing the management of the tracking process;
- getting prior client consent and/or organizational approval for institutions, and setting up procedures *in advance* for locating clients through institutional sources;
- collecting detailed locator information and immediately verifying its completeness /accuracy. This includes collecting primary address etc. for recontact and having the client complete a postcard to be mailed with an incentive; collecting the address etc. of two other people who know the client; requesting other verifying information such as drivers license; collecting the name of the shelter or the health care services the client would go to if something happened to them;

- staying in touch with the client during the interim period, including having the client check in once a month by letter, phone or in person;
- using successively more intensive and expensive approaches to locate people, beginning with reminder postcards and/or phone calls, progressing to messages or trackers looking for the person at shelters or clinics, discussion with friends and a "bounty" of 5$ to $10 for the person who can locate the person on behalf of the follow-up team;
- splitting incentives, for example for questionnaire completion and keeping other regular contacts; and
- setting a deadline for when a case is lost to follow-up (e.g., two to three months). This puts an added pressure on field workers. Deadlines include the overall goal and a final "drop-dead" date.

Many of these recommended activities are quite resource intensive and each jurisdiction must decide on the balance between rigour and resources.

5.5 The conduct of follow-up interviews

The common practice in outcome monitoring is to use telephone interviews and, depending on the resources available, supplement these with in-person interviews. Telephone follow-up will be inappropriate in situations where few clients have phones, or where phone calls to clients' homes may violate their rights to privacy. With some "special" populations it may also be difficult to conduct the telephone interview (e.g., elderly people, people with cognitive impairment).

5.5.1 Selection and training of interviewers

An important recommendation for outcome monitoring is that interviews with clients be undertaken by people not associated with the provision of the intervention. With full integration of the clinical assessment and outcome baseline measures, the baseline

data will of necessity be collected by program staff. If resource constraints require that program staff also assist in the collection of follow-up information, they should not do so for clients they have been directly involved with. This is important in order to avoid clients either falsely reporting positive or negative outcomes as a result of wishing to please, or indeed to punish, the clinical staff who have treated them.

The language in which the follow-up interviews is conducted is of obvious concern. This may be difficult to accommodate in all cases, especially if the program has a multicultural clientele. Caution must be exercised in using outcome measures validated in one culture and developed in a particular language, and then translated into another language. Such cross-cultural application may significantly influence the reliability and validity of the measure. Whether you are using face-to-face or telephone follow-up interviews, an important issue in the selection and training of interviewers is the extent to which they are allowed to address clinical issues that may arise. It is recommended that a written protocol be developed for interviewers to guide their response to requests for additional treatment or more serious emergencies such as expressed suicidal ideation. While clinical training and experience are usually not required of follow-up workers, they must be capable of responding professionally to a range of situations that may occur. As noted earlier, the follow-up contact in an outcome monitoring system can be part of a deliberate strategy to identify clients who need additional services and to re-engage them in treatment before their situation deteriorates further.[48]

6.0 MEASURES USED IN OUTCOME MONITORING

6.1 Measures of Outcome

The choice of measures is critical to the success of the outcome monitoring system. A wide range of potential measures is available and the final selection must be closely tied to the choice of data collection method. For example, some measures will be appropriate for self-completion, others by telephone and still others may require a face-to-face interview with particular groups of clients. Most importantly the choice of measures must be guided by the objectives that the treatment system (and its component programs) is trying to achieve. These objectives are themselves often guided by the ideological or theoretical basis of the treatment system or its many component programs (e.g., harm reduction, early intervention, recovery model, socio-behavioural treatment). Program and system-level logic models are a useful tool for objectives clarification,[67] and time must be set aside in the planning stage to involve key stakeholders in a discussion of system/program philosophy and treatment objectives, and their relationship to appropriate outcome measures. It is widely accepted that a multi-measure approach is needed for outcome monitoring given the complex nature of substance abuse and comorbidities, and the widely varying expectations from treatment.[10,39]

Specific measures might be included for:

- alcohol use, heavy alcohol use, and alcohol related problems
- drug use, heavy drug use and drug related problems
- treatment utilization (including the return to treatment)
- illegal activity, jail/incarceration
- employment/school problems
- health and mental functioning/distress
- use of health and mental services
- pregnancy and low birth weight babies

Particularly controversial in the development of the package of outcome measures are:

- the importance and/or investment to be made in getting amount of use (e.g., timeline follow-back approach; quantity-frequency-variability measures);
- the importance and/or investment in the use of diagnostic measures (e.g., CIDI, DIS, SCID); and
- validation of self-reported substance use with urine and/or collateral report

6.2 Measures That Predict Outcome

In addition to the outcome measures, one also needs measures that help explain or predict outcome for certain groups of clients. For example, alcohol and drug use is a common outcome measure; psychiatric comorbidity and social stability are common predictor variables. Demographic characteristics of clients such as gender, age, and socio-economic status are often used as predictor variables. Some measures may be used in one analysis as the outcome, and in another analysis as the predictor. For example, one could assess the extent to which clients have improved on a measure of mental health status following treatment. One could also assess whether people who score high or low on the mental health measure do better or worse on particular outcomes such as frequency of drinking or drug use. In the second instance, mental health status is being used to explain changes in drinking or drug use. There are a large number of possible outcome predictors which could be included as measures in an outcome monitoring system. Variables that have been found to be important predictors are reviewed by drug class in Sections 7, 8 and 9. This information will assist in choosing good candidates for inclusion in a brief, generic instrument assessing treatment outcome.

In addition to these predictors one must ensure that client demographic information

and treatment process data are defined at the planning stage and collected routinely. One must also decide whether to collect all of the outcome information from one source (usually the client), or from more than one source. Having additional information (e.g., breathalyser; urine screening tests, and/or collateral reports)to back-up clients' self-reports is recommended, where resources allow.

Measures are needed that are brief, practical, reliable and scientifically valid. It is recommended,[59] that ideally all measures should be:

- face valid (unless they are specifically being used to measure denial or misrepresentation);
- statistically sound (e.g., test-retest reliability of .6+; interval consistencies of .7+; and items or scales that correlate with the outcome measure .7+); and
- developed, validated and/or normed on a similar population to that for which they will subsequently be used.

The recent review of the available measures of treatment outcome[10] highlighted that there are no existing instruments that are sufficiently brief and/or with satisfactory psychometric properties. A recently developed very brief measure of treatment outcome relies on subjective clinician's summaries and has been not been replicated by others.[68] The Addiction Severity Index (ASI)[69] is the measure utilised by the US Drug Evaluation Network Study.[70] The ASI is a comprehensive measure of treatment outcome across seven domains. It takes 45-60 minutes to administer and requires 3 days training for the participating clinicians. This measure has been criticised for its use of subjective assessments of problem severity, in particular health outcomes, that require non-medical personnel to make judgements on health states.[71]

In addition to the ASI, US researchers have developed the more recent Global Assessment of Individual Needs (GAIN).[72] The GAIN checks for major problems and recency of problems across 8 domains, including detailed behavioural counts for the past 90 days. There are currently two main versions available: the GAIN-Initial (which has an administration time of 50-110 minutes) and the shorter GAIN-Monitoring 90 days (a quarterly follow-up instrument which takes 25-45 minutes to administer). Both versions include questions on service utilization. In Ontario, Canada, the Centre for Addiction and Mental Health has developed a comprehensive treatment outcome assessment package that complements their monitoring data set known as the Drug and Alcohol Treatment Information System (DATIS). This package of measures is also very comprehensive and required considerable time and expertise to administer.[73]

A relevant Australian project is the *Health Outcomes Database Project* conducted by the New South Wales Network of Alcohol and Drug Agencies (the peak body of the non-government agencies in NSW).[74] They developed a comprehensive outcome measure that takes around 60 minutes to complete. It was piloted with a group of 13 volunteer agencies in 1997-98. It involves baseline and 12 month follow-up data collection. As a result of its length and complexity, the follow-up rate was only 25% of the intake sample (893 clients) The range for follow up was 14-64% among those agencies who attempted follow-up data collection (3 agencies withdrew because of the difficulty in collecting follow-up data). This project is on-going ,but with enhanced computing support, and will be used as a means of assessing the validity of the brief, generic treatment outcome module compared with this more resource intensive data collection.

An Australian measure now used internationally, The Opiate Treatment Index,[11] is reviewed in the recent NDARC report.[10] As this measure is not designed for the full

range of alcohol and other drug treatment services (and is of marginal length at 30 minutes to administer) it does not meet all the requirements of a routine, brief, generic treatment outcome measure at the present time.

In summary, the final selection of outcome measures should be guided by:

- program and system objectives;
- the client population served;
- the total time to be invested in the clinical assessment process for the collection of baseline data;
- the potential use of the computer to assist in collection of the information (i.e., self-administered questions);
- the time period over which clients will report substance use, consequences etc.;
- established reliability and validity data;
- cost to use the instrument if it is not in the public domain;
- the follow-up data collection strategy (i.e. telephone versus face-to-face interviews); and
- the resources available for data collection, analysis and preparation of reports.

7.0 PREDICTORS OF OUTCOME FOR ALCOHOL TREATMENT

Reviews such as those by McLellan and colleagues[75] have highlighted the similarity of outcome predictors across opiate, cocaine and alcohol treatment. This review concluded that greater substance use at follow-up was only predicted by greater severity of substance use at treatment admission. Better social adjustment at follow-up was negatively related to severe psychiatric, employment and family problems at

admission; and positively predicted by more psychiatric, family, employment and medical services provided during treatment. The following sections will briefly highlight additional issues to be considered for particular substance categories in the measurement of treatment outcome.

A large proportion of the literature regarding outcomes of substance treatment comes from the alcohol field. Many findings and issues raised by research in this field are common across drug classes, while some may be more relevant just to alcohol disorders.

7.1 Prevalence of alcohol use disorders in Australia

The legal status of alcohol, and general cultural acceptance of this substance, has led to a greater prevalence of alcohol disorders compared with other illicit substance disorders. As mentioned in Section 2.1, alcohol use disorders account for the majority of substance use disorders in Australia with 9.4% of males and 3.7% of females meeting criteria for this disorder in the 1997 survey.[14] Historically, the prevalence of alcohol use and alcohol use disorders has contributed greatly to a very complex debate about treatment philosophies. For example, the debate about controlled or moderate drinking by those with alcohol use disorders has stimulated discussion about what constitutes successful treatment outcome across various substance categories.

7.2. Treatment approaches for alcohol use disorders

Treatment approaches used for alcohol disorders have much in common with those used for other substance use disorders. Detoxification to manage withdrawal is often the first step in the treatment process, although it cannot be considered a treatment in its own right.[76] In the case of alcohol, sudden cessation of use can lead to potentially life-threatening medical complications, as well as other unpleasant but less

serious symptoms such as irritability, insomnia and tremors. Hence, many patients choose to become alcohol free under medical supervision (either medicated or unmedicated) before beginning longer-term treatment. Detoxification can take place in an inpatient or domestic setting. Home detoxification appears to be as safe and as effective as inpatient care for a large proportion of problem drinkers, and is more cost effective.[77] Inpatient detoxification is recommended for severely dependent drinkers, persons with more severe withdrawal symptoms and those with an unstable home environment.

Fuller and Hiller-Sturmhofel (1999) provide a good summary of available treatment methods, which include non-pharmacological treatment methods, self-help groups, pharmacotherapy, and brief interventions.[78] There are two broad treatment settings – inpatient (hospital or residential) and outpatient, with the vast majority of clients treated in the latter.

Non-pharmacological treatment methods include various types of psychotherapy and counselling.[79] The family of interventions known as 'cognitive-behavioural therapies' (CBT) reflect the assumption that substance use is a learned behaviour.[80] These commonly used interventions are designed to help the patient identify high-risk situations for relapse, learn and rehearse strategies for coping with these situations, and recognize and cope with craving. Another common strategy is motivational enhancement therapy (MET), which strives to motivate the client to use their own resources to change their behaviour. These techniques are used not only in the addictions field in general, but in other areas aiming to achieve behavioural change.

There are several pharmacological treatments available, with some of these specifically for use in the treatment of alcohol disorders. *Disulfiram* is widely used as

an aversive medication, to deter the client from drinking by causing an unpleasant reaction when alcohol is ingested. *Naltrexone* (also used to treat opiate disorders) and *Acamprosate* are less commonly used anti-craving medications that prevent alcohol from causing pleasant effects. A review of the five major drug classes used in the management of alcohol use disorders; *disulfiram, naltrexone, acamprosate, serotonergic agents* and *lithium*, has recently been completed.[81]

In addition to the range of professional treatment approaches described above, the twelve-step self-help movement Alcoholics Anonymous (AA) remains one of the most widely used resources for people with alcohol problems.[78] People with alcohol use disorders can become involved with AA at any stage of the treatment process: before entering professional treatment, as part of professional treatment, as aftercare, or instead of professional treatment. AA members also differ in their degree of involvement with the groups. Most treatment programs encourage clients to attend AA meetings, and some particularly facilitate involvement (Twelve-step facilitation interventions; TSF). Although the style of AA programs varies, the central philosophy is that alcohol dependence is a disease with spiritual, emotional and physical components, and that the only viable alternative is complete abstinence from using alcohol. Twelve consecutive steps are outlined that the individual must achieve in order to recover, for example, identifying as an alcoholic and acknowledging that they are powerless over alcohol.

AA is the most popular self-help group for people with drinking problems, although other similar groups do exist. Related self-help groups for people with other substance problems, such as Narcotics Anonymous (NA) and Cocaine Anonymous (CA), have also attracted members. However, AA has the largest momentum, particularly in the United States. AA has rarely been studied as a treatment in itself until recently, although 'AA

involvement' is often included as a patient characteristic variable in outcome studies, or as a desirable outcome of professional treatment.[82,83,84]

An 8 year multi-site study of the effectiveness of treatment approaches for alcohol problems, known as Project MATCH, was completed in the US in 1998. This trial included 1726 participants and compared 12 sessions of TSF, 12 sessions of CBT and 3 sessions of MET. A variety of client characteristics were measured at assessment and outcome was evaluated at 3 monthly intervals for 15 months. It was found that there were relatively few differences in treatment outcome between the treatment types despite the major differences in philosophy and procedures.[85]

Finally, brief interventions conducted in primary care settings can be pivotal in helping people with alcohol problems.[86] Many people who are experiencing or who are at risk of alcohol problems do not consult specialist alcohol services, but receive health care from a primary care provider. This provides an opportunity to identify and treat problems (or potential problems) in this environment. Brief interventions usually consist of assessment and direct feedback, goal setting, behavioural modification techniques, self-help directed bibliotherapy, and follow-up and reinforcement. These steps ideally take place over approximately 3-4 visits.[86] It is a particularly useful approach for the treatment of mild-moderate alcohol problems because of their high prevalence in the community, although this approach can be utilized to assist in behaviour change in many areas.

7.3 Factors Predicting Alcohol Treatment Outcome

Given that in general, the alcohol treatments described above have been shown to be effective, what factors predict individual variability in treatment outcome? Research has yielded a large amount of information in response to this question, although the

findings have not always been in agreement. Inconsistency may be due to factors such as study design, the nature of the treatment programs, the characteristics of the populations studied, and the specific outcome variables measured (eg. alcohol consumption, social adjustment). Often studies in the past attempting to predict outcome have focused on patient variables at the start of treatment. This may reflect the conceptual approach that alcohol use disorders are endogenous and can therefore be best explained by predisposing factors that are inherent in the individual.[87] Recently, more work has gone into establishing what aspects of alcohol treatment lead to a better outcome in different sub-groups of clients, as more sophisticated measures of the treatment environment and treatment processes have been developed.[75]

Of the main variables that have been hypothesized to affect alcohol treatment outcome, Nathan and Skinstad[88] report that younger alcohol patients appear to be better treatment prospects than older patients, while others have not found any main effect of age to be present.[89] A meta-analysis concluded that gender differences in alcohol treatment outcome are small, and that women appear to have better results in the first year of follow-up, while men have better results after the first 12 months.[90] Lower levels of intake functioning (for example, severity of drinking problems or social adjustment) typically do predict poorer outcomes,[91] although severity of *dependence* at intake has not always been found to predict outcome.[92] Psychiatric comorbidity is an important factor that has been found to predict poorer treatment responses.[93] A person with an alcohol use disorder as well as a non-substance use disorder (such as depression or anxiety) may have a poorer outcome for a number of reasons, including misdiagnosis or lack of treatment for the comorbid disorder, or because the comorbid disorder may impair compliance with alcohol treatment. The extent of social support provided by family and friends has been associated with better response to treatment,[94] along with the nature of the social network

dynamics.[95] Other potentially important patient variables include ethnicity, personality variables, readiness to change and motivation.

McLellan and colleagues found that intensity of treatment was a secondary predictor of social adjustment outcomes but not substance-use outcomes, with patient severity at admission accounting for more variance in both these domains.[75] The goal of a treatment program, such as abstinence or general reduction in drinking, may also impact on outcome, particularly if the outcome measures are structured in such a way to include or emphasise abstinence as a category of alcohol consumption. Treatment process variables, or "proximal outcomes" may also be used to predict "ultimate outcomes".[80] For example, certain changes that are assumed to take place during twelve-step treatments (according to the theory underlying that treatment) include accepting an alcoholic identity, or coming to believe in the disease model of alcoholism.

Another variable that has commonly been examined is the setting of treatment. Although outpatient treatment is more cost-effective, the findings regarding client outcomes of inpatient or outpatient treatment are controversial. The quality of individual therapists and their ability to engage the client has been recognised to be an important predictor of outcome. Client and therapist ratings of the 'therapeutic alliance' predicted treatment participation and drinking outcomes among outpatient clients, but not aftercare clients, in the Project MATCH sample.[96] Length of stay in treatment (or length of the full treatment itself) and participation in various treatment components are often hypothesized to affect outcome. Despite the array of predictor variables that can possibly be measured, the overall variance explained by different combinations of both treatment and patient variables is still relatively low in many alcohol treatment outcome studies.

A more specific approach than establishing factors that predict outcome across treatment approaches, or establishing which approaches are generally more effective, is attempting to determine what predicts outcome for *specific types* of alcohol treatments. For instance, Project MATCH asked whether certain patient characteristics could predict which treatment approach would be most effective for a given patient.[97] There were few variables that suggested that patients and alcohol treatments could be 'matched' for better outcomes. Fuller and Hiller-Sturmhofel summarized the main results: Among patients who had already received inpatient treatment, cognitive-behavioural therapy was more beneficial for the less severely dependent patients, whereas the twelve-step facilitation intervention was of more benefit to the more severely dependent patients. Amongst patients who had been receiving outpatient treatment, patients with high levels of anger did better when treated with motivational-enhancement therapy, and TSF (and the resulting AA involvement) was particularly effective for those with social networks that were supportive of drinking.[78]

It has been difficult to determine whether findings regarding predictors are specific to alcohol treatment or may be relevant to treatment for other substances, as different studies have typically used different patient/treatment measures and different follow-up intervals. Further, the underlying assumptions and treatment goals across substance groups may be quite different.[75]

McLellan and colleagues found general similarities but also some differences between patients treated for alcohol, opiate and cocaine disorders, in the predictors of post-treatment substance use and social adjustment.[75] Across the three substance groups, the number of previous treatments and the severity of substance use problems at

admission were the most significant predictors of substance use at follow-up, while demographic variables had a minor predictive value. Age was not related to better outcome in the alcohol group, while it was in the opiate group. Similarly, the severity of legal and family problems at admission did not predict social adjustment for alcohol patients, but significantly predicted this variable among opiate patients. Overall, the available independent variables were able to predict opiate treatment (methadone maintenance) outcome substantially better than they were able to predict alcohol treatment outcome, with the alcohol group being more similar to the cocaine group.

8.0 PREDICTORS OF OUTCOME FOR OPIATE TREATMENT

8.1 Prevalence of opiate use disorders and mortality in Australia

As reported in section 2.2 the estimated Australian national prevalence rate of opiate use disorders ranges from 2.0 per 1000 adults aged 15-54 years[14] to 6.9 per 1000 adults.[18] While they are less common than the other substance use disorders, opiate use disorders account for a relatively large proportion of the individual and societal health and social costs of substance use disorders. In the 10 years 1985-1995 the proportion of all deaths attributed to opiates in Australia rose from 0.21% to 0.47%.[98]

8.2 Non-pharmacological treatments for opiate use disorders

8.2.1 Detoxification

Unlike alcohol, abrupt cessation of opiate use does not precipitate a life threatening withdrawal syndrome. In contrast to the literature on detoxification from alcohol , inpatient detoxification for opiates is more effective than outpatient.[99] This may be due more to the unstable and non-supportive living environment of opiate users, and thus lack of treatment completion of outpatient detoxification, than the treatment setting *per se*. Unlike alcohol, level of dependence is not predictive of severity of withdrawal from opiates. Instead symptom severity has been shown to be more strongly associated with neuroticism and expectations about withdrawal distress.[100] As

a consequence of the high levels of anxiety and apprehension associated with withdrawal it has been proposed that counselling and psychotherapy may be useful adjuncts to a medicated withdrawal program.[102] A range of medications have been evaluated for their effectiveness in opiate withdrawal from opiate agonists such as naltrexone, alpha adrenergic agents such as clonodine and mixed opiate agonists-antagonists such as buprenorphine.[101]

8.2.2 Residential rehabilitation

There have been no randomised controlled trials of therapeutic communities,[101] although they are considered effective for a small proportion of opiate users who find this treatment acceptable. The length of time in treatment and completion of the program is the main predictor of successful outcome.[102] In general, therapeutic communities are more demanding of drug users, and hence are less successful than maintenance pharmacotherapies in attracting and retaining dependent heroin users in treatment. There is some evidence that therapeutic communities may be more effective when they are used in combination with legal coercion or during imprisonment to ensure that heroin users are retained in treatment long enough to gain benefit.[29] Residential drug-free programs other than therapeutic communities are relatively rare in Australia.[102]

8.2.3 Outpatient drug-free treatment

This category covers a diverse range of treatment approaches which are characterised by a focus on counselling and practical assistance, and an absence of medication. As Gruber and colleagues recently commented, there is virtually no data available on outcomes for opiate abusers enrolled in outpatient programs.[103] These researchers found few differences after 3 months between a control group and a client group enrolled in reinforcement-based intensive outpatient treatment. There is no support for the use of family therapies or behavioural and cognitive behavioural therapies as

stand-alone treatments for opiate dependence, although they may still be useful as ancillary components of methadone maintenance treatment, or as part of an aftercare program.[102] Outpatient drug-free treatment is usually attended by individuals with less severe drug problems, and has doubtful effectiveness for the majority of opiate users.[102]

No randomised controlled trials have been conducted to ascertain the effectiveness of self-help approaches such as that provided by Narcotics Anonymous.[101]

8.3 Opioid Replacement Therapies

8.3.1 Methadone maintenance

Methadone maintenance is the most widely used and researched regime for the treatment of opioid dependence.[101] There are currently 14,028 individuals receiving methadone in New South Wales.[104] While there have been five randomised controlled trials examining the effectiveness of methadone maintenance treatment (MMT), all of these trials have involved small numbers of clients who have been followed up for rarely longer than one year.[98] Assessments of the effectiveness of MMT, therefore, have also largely depended on large, observational treatment outcome studies that have followed a representative sample over time to assess the outcome on drug use, crime and other measures. Statistical methods have been used to assess the plausibility of alternative explanations of differences in outcome between MMT and other forms of treatment.[105] For example, these controlled observational studies have generally shown that clients in MMT very substantially decreased their heroin use and criminal activity while they remained in treatment. The typical reduction in the frequency of illicit heroin use has been from 2 to 3 times per day to once or twice per week.[105] MMT also reduced the transmission of HIV among injecting heroin users by reducing the frequency of injecting and needle sharing.[106,107] Two large prospective

cohort studies in the US also found that exposure to MMT during follow-up protected against HIV infection.[107,108]

The risk of opioid overdose death is also substantially reduced among those receiving MMT.[110,111] Gearing and Schweitzer reported that the mortality among 17,000 patients receiving MMT (7.6 per 1000 pa) was similar to that in the general population (5.6 per 1000 pa) and significantly lower than among those who left MMT (28.2 per 1000 pa) and opioid users who were not in treatment (82.5 per 1000 pa).[112] An Australian study of 307 individuals enrolled in MMT in the early 1970s revealed that they were nearly three times more likely to die than those not in MMT.[113] This was largely due to the reduced likelihood of those in MMT committing suicide or dying from a heroin overdose.[111]

Finally, many of those seeking treatment for opioid dependence have a history of criminal activity.[113] MMT has been consistently shown to reduce both heroin use and crime while the individual receives adequate doses of methadone in a program with a goal of methadone maintenance.[108,114]

A recent North American study of the cost-effectiveness of expanding MMT for heroin dependence concluded that additional MMT capacity costs $8,200 per quality adjusted life year (QALY) gained in a high HIV prevalence community and $10,900 per QALY in a low HIV prevalence community. More than half of the benefits gained are for individuals who do not inject drugs. They concluded that additional capacity remains cost-effective even if it is twice as expensive and half as effective as current MMT places.[115]

8.3.1.1 Predictors of MMT outcome

A number of program factors that impact on MMT outcome have been identified. Consistent with the model proposed by Dole and Nyswander in 1965, dose has been consistently shown to effect treatment outcome.[116] In their review, Ward and colleagues concluded that methadone dose has a positive, linear dose-response relationship with retention in treatment and a negative linear relationship with heroin use.[105] That review similarly concluded that research supports a long-term maintenance treatment policy with detoxification from methadone an unrealistic treatment goal for many clients.[105]

An important clinical and policy issue in MMT is the use of take-home doses for stable clients. A study by Rhoades and colleagues reported that allowing clients to take home doses from twice-weekly treatment centre visits improved retention compared with a five times per week regime with no significant increase in heroin use.[117] This finding is consistent with the those of other studies.[105] A further program factor influencing MMT outcome is program "style". It has been argued that as with treatment for other medical and psychological disorders, the clients must be treated on an individual basis. The outcome will be dependent upon the treatment being part of a well structured program where individual treatment plans have clear rationales and objectives, adequate structure and record-keeping.[105] In their study, Magura and colleagues reported that variables classed as in-treatment were better predictors of retention in methadone. In particular, they found that constructive response to patient problems positively predicted retention.[118]

An important factor in the individualisation of MMT is the role of counselling and psychotherapy. The review by Ward and colleagues makes a number of points on the role of counselling.[105] These include that where MMT has been shown to be effective, it has employed counselling as part of the treatment. They add that therapist effects

may be more important than the counselling model per se. and that effective therapists do not necessarily come from a particular theoretical tradition.

Further program factors which have a bearing on MMT outcome include rapid assessment prior to induction to treatment improving retention in a clinic that is accessible in terms of operating hours and location. The use of punitive regimes for opioid positive urines is counter-productive while the provision of ancillary services, such as medical care and vocational training, have been shown to improve treatment outcome.[105]

A number of client factors have also been shown to predict MMT outcome. Drug use other than heroin, particularly benzodiazepines, has been shown to lead to riskier behaviours[119,120] and poorer prognosis for MMT clients.[120] The second major drug class of concern to MMT clinicians, particularly in the US, is cocaine.[106] Cocaine injecting, along and with heroin, is strongly associated with a range of high risk activities and HIV seropositivity.[121,122] While use of cocaine is related to continued risk, there is evidence that MMT reduces the prevalence and frequency of cocaine use.[105,106]

Injecting drug users are at increased risk of psychiatric comorbidity. The three most common disorders are antisocial personality disorder (ASPD)[1123], mood[124] and anxiety disorders.[125] Clinically, clients in MMT with a diagnosis of ASPD may enter treatment with a higher levels of risk taking and longer standing drug use problem. On the balance of evidence, however, they do not appear to benefit significantly less from MMT than other clients.[105] Those clients suffering mood and anxiety disorders who demonstrate significant distress have been shown to have poorer outcomes than other clients.[105] The data also indicate, however, that MMT can significantly reduce levels of psychological distress among IDU,[124] particularly in the first four months of

treatment.[126]

As summarised by Ward and colleagues clients who are younger, have higher levels of pre-treatment criminal involvement, who are more dependent, and who have higher levels of alcohol use tend to be retained in treatment for shorter periods of time. Predictors of greater retention include pre-treatment employment, living with a spouse/family, motivation for treatment, and realistic expectations of the treatment process and outcome.[105] Related to the last point, previous MMT has been found in some studies to predict better MMT outcome in some studies.[117]

8.3.2 Other opioid replacement therapies

A number of oral opioid replacement therapies are currently being trailed in Australia. The most well known is levo-alpha-acetylmethadol (LAAM) which is a synthetic opioid agonist related to methadone. Its major advantage compared with methadone is that it has a longer half-life, which makes second daily, or even third daily dosing, possible. This dosing regime has a number of advantages for the client, the clinic and treatment funders, while also reducing the possibility of dose diversion.[105] A number of trials have compared the effectiveness of LAAM and MMT and found no significant differences in treatment outcome.[127,128]

Other pharmaceuticals such as long-acting oral morphine and diacetylmorphine (heroin) maintenance therapy are also topical opioid replacement therapies which are unlikely to be available nationally in the near future.

8.3.3 Mixed opioid agonist-antagonist replacement therapies

Buprenorphine, is a partial opioid agonist with a strong analgesic effect which is currently undergoing clinical trials as a pharmacotherapy for opioid dependence. Its principal advantages include its safety in overdose, amenability to thrice-weekly

dosing and reduced withdrawal symptoms upon cessation of use.[105] Like LAAM, buprenorphine has been shown to be as effective as MMT in retaining clients in treatment and reducing illicit opioid use.[129,130] To reduce the diversion and opioid overdose risk even further, buprenorphine can be combined with naloxone. This might also facilitate buprenorphine withdrawal.[131]

8.3.4 Opioid antagonist maintenance

Naltrexone is an opioid antagonist that effectively blocks the subjective and physical responses to opioids. It can be dosed daily or two to three times a week at higher doses. It has been shown to be safe and well tolerated with few side effects, although high doses have been associated with raised transaminases and depressed mood.[132] As it lowers the opioid tolerance of the individual it leaves them at greater risk of overdose should they relapse to opioid use. However, as it has no opioid agonist effects it has no withdrawal, abuse or diversion potential. Despite these advantages it has not been shown to be well accepted by clients, with poor retention rates.[133] As a result reviews have concluded that it is most suitable for highly motivated or legally detained individuals.[105,133]

9.0 PREDICTORS OF OUTCOME FOR OTHER DRUG CLASSES

The next two most important drug classes for consideration are cannabis and psychostimulants such as amphetamines and cocaine. The remaining drug classes such as hypno-sedatives and hallucinogens are much less prevalent and have less well described dependence syndromes and clinical interventions.

9.1 Cannabis use disorders

9.1.1 Prevalence of use and disorders

Cannabis is typically used experimentally or intermittently in adolescence and early adulthood, and is generally discontinued by the mid to late 20s.[134] While only a

minority proceed to long-term regular use, it is by far the most widely consumed illicit drug in many Western countries.[135] Approximately 40% of Australians aged 14 years and over have tried cannabis and almost one in five (18%) have used it in the past year.[136] Survey data indicate that the lifetime prevalence of cannabis use in Australia and the United States, particularly among adolescents, has increased throughout the 1990s, after a decline in the 1980s and early 1990s.[137] In Australia, the prevalence of lifetime and recent use among female adolescents appears to have almost doubled between 1995 and 1998.[136]

While the existence of cannabis dependence has been a contentious issue for some years, there is now a growing body of evidence that suggests there is a cannabis dependence syndrome which is consistent with that of other classic drugs of dependence. Certainly, regular use of cannabis produces a marked tolerance, similar to other drugs of abuse and dependence. However, there is now evidence that cessation of cannabis use also produces a *withdrawal* syndrome,[138,139] another major characteristic of drug dependence.

In addition to recent research on cannabis dependence symptoms, there has been an accompanying focus on defining the prevalence of cannabis dependence in various communities. Population-based studies have consistently revealed that cannabis is the most widely used illicit substance in communities around the world. Estimates of the number of persons who have ever tried cannabis are typically in the order of one third to one half. The 1997 National Mental Health and Well-being Survey revealed that cannabis dependence is the most common illicit drug dependence in Australia with a general population figure of 2.5% of males meeting criteria for cannabis dependence in the past year. Of those people smoking cannabis more than five times 23.3% met criteria for dependence in the past year.[14] Despite these high levels of

problem use, less than 15% of those with a substance use disorder had sought assistance from a health professional.[14]

9.1.2 Cannabis-specific interventions

Despite the growing demand for cannabis treatment, there have been few clinical trials of interventions for cannabis use disorder.[140] A randomised controlled trial of cognitive-behavioural therapy (CBT) for cannabis dependence compared group-delivered CBT with a basic skills training approach, both of which were tailored specifically for cannabis dependent clients.[141] At 12 months follow-up there were substantial reductions in number of days of cannabis use and cannabis problems, compared with pre-treatment, but no differences in rates of abstinence (14.5%) between the two treatment groups. Abstinence rates were comparable to those reported for the alcohol and tobacco smoking cessation fields. This research offers a promising, empirically verifiable approach to the treatment of cannabis dependence, and clearly warrants further investigation.

A recently completed Australian randomised controlled trial of 229 severely dependent cannabis users evaluated an individualised CBT approach.[142] Participants were assessed and randomised to: (a) a six session intervention package incorporating a motivational interview and a standard relapse prevention intervention; (b) a one session version of the more intensive intervention with a self-help booklet; and (c) assessment and placement on a 24 week wait-list control group. The findings suggest that while continuous abstinence rates at approximately 8 months were low, they were consistent with those found in similar studies of brief interventions for other drugs. There was a significant impact on frequency and amount of cannabis used and in the associated harms, including relationship, family and work related issues, and on levels of depression and feelings of dependence.[142]

9.1.3 Large scale studies and cannabis

Large studies such as DATOS[29] found significant reductions in cannabis use in clients participating in long-term residential and out-patient drug free treatments. Similarly, CALDATA[30] reported significant reductions in cannabis use and psychosocial functioning in these treatment settings. The National Treatment Improvement Evaluation Study[144] also noted that the combined results for cannabis use, whether clients were treated for cannabis use or poly-drug use, showed large reductions in use following treatment. Given the paucity of research in this field there is no specific literature on the measurement of treatment outcome for clients presenting for cannabis use disorders. The two randomised controlled trials reported found that treatment impacted in the same domains of substance use, health, psychological well-being and social functioning as used in intervention research for other substances.

9.2 Psychostimulant use disorders

The pattern of psychostimulant use in Australia is rather different to that of the US and Europe. While 4% of Australian had used amphetamines in the previous 12 months only 1% have used cocaine in 1998 Household Survey.[136] The low prevalence of cocaine use led to the use of the combination of all psychostimulants in the 1997 NSMHWB to reveal an estimated prevalence of 0.2% of the population meeting criteria for stimulant use disorder in that year.[14]

9.2.1 Amphetamines

The most common form of this synthetic stimulant drug used in Australia is methamphetamine or "speed". That they are commonly injected means that users are also exposed to increased risk of blood borne viruses. Despite the relatively high prevalence of use and associated harms, there are very few specialist interventions

for amphetamine use disorders.[101] There have been recommendations for clinical intervention research and a call for models such as shared care to be developed for the appropriate diagnosis, treatment and referral of patients presenting to primary health care practitioners with amphetamine related problems.[145]

The most controversial intervention for amphetamine use disorder is amphetamine maintenance. Schuckit concluded in his 1994 review that no pharmacological intervention had been found to be superior to placebo for the treatment of stimulant-dependent individuals.[146] Recent, small observational studies, however, suggest that amphetamine maintenance has reduced illicit amphetamine use and injecting, improved social functioning and increased engagement with treatment services.[147]

The intervention model with the strongest empirical support to date are cognitive behavioural interventions that include contingency management and relapse prevention techniques.[148]

9.2.2 Cocaine

As mentioned previously, cocaine use is more common in the US, particularly the freebase form known as "crack". This epidemic in the 1980s has now diminished but it has been estimated that 0.7% of those aged 12 years and over were cocaine dependent in the US in 1997.[149] There are a number of significant harms associated with cocaine use, including the morbidity and mortality of fatal and non-fatal overdose, irreversible damage to the cardiovascular system and nasal septum (if snorted), exposure to blood borne viruses (if injected or smoked), acute psychosis, and risks to the developing foetus.[149]

9.2.2.1 Cocaine interventions

Cocaine withdrawal is not a life-threatening syndrome and generally only requires non-medicated, psychosocial support.[150] Four broad categories of pharmacotherapies have been described for cocaine use disorders in recent expert reviews.[151] These include: (1) drugs that treat pre-morbid, co-existing psychiatric conditions; (2) those that treat withdrawal and craving; (3) cocaine antagonists that block the action of cocaine; and (4) drugs which cause an aversive reaction to cocaine. Some medications, such as antidepressants, clearly fall into multiple categories. The empirical evidence for these pharmacotherapies is either poor or inconclusive.[101] The SSRI group of antidepressants show some promise but have not yet been subject to randomised controlled trials. Blocking agents such as flupenthixol and buprenorphine are also worthy of further research especially among psychotic, and/or opiate dependent cocaine users.[101] As the safety of cocaine use is unpredictable, and there are poor retention rates in previous pharmacological interventions for cocaine use, caution should be exercised when trailing new medications because of the possibility of dangerous additive effects of the trial drug and cocaine.[101]

Traditionally, psychosocial therapy for cocaine dependence has been based on the twelve-step approach. More recently contingency-based behavioural interventions are proving promising.[152,153] While the use of food and services vouchers may improve treatment outcome for cocaine dependence there is some question of the long-term benefit and utility in divergent social settings.[154] There is consensus, however, that more intensive programs, with sessions at least once per week, for at least three months are more likely to be effective for cocaine dependence.[101]

9.2.2.2 Predictors of cocaine treatment outcome

As McLellan and colleagues point out, outcome predictors for opiate, cocaine and alcohol treatment are similar.[75] A later study of psychosocial treatments for cocaine

abuse confirmed that positive 12 month treatment outcomes are predicted by attending more treatment sessions, being male, being better educated, using less cocaine and to having spent more time incarcerated in the previous 12 months.[155] A study examining the utility of a lifetime severity index for cocaine use disorder in predicting outcomes of cocaine treatment also found that higher levels of dependence predict poorer outcome.[156] There is no reason to believe, therefore, that a brief, generic measure of treatment outcome would not be equally applicable across treatment and drug types.

9.3 Summary of good predictor variables

The main predictor variables that are good candidates for inclusion in this brief, generic measure of treatment outcome, and hence for examination within the outcome monitoring system, are summarized on the following table:

TABLE 2 PREDICTORS RECOMMENDED FOR INCLUSION IN AN OUTCOME MONITORING SYSTEM FOR ALCOHOL AND OTHER DRUG TREATMENT SERVICES

Pre-treatment patient characteristics	
Demographics	*Gender* *Age* *Country of birth* *Indigenous status* *Employment status* *Living arrangement*
Drug Use	*Principal drug of concern / other substances of concern* *Severity of dependence* *Frequency/extent of last month use: alcohol, opioids, cannabis, cocaine, amphetamines, tranquillisers* *Route of administration of principal drug of concern* *Experience of overdose* *Previous drug treatment history*
Health	*General health* *Psychological health*
Social functioning	*Financial problems* *Conflict with partner/relatives/employer/school* *Amount of time spent with other drug-users* *Recent arrest history*
Treatment characteristics	
	Source of referral to treatment *Setting of treatment* *Length of treatment* *Additional services provided* *Reason for cessation of treatment*
Additional variables relevant to Methadone/BUP	*Where methadone is prescribed* *Dosing point* *Dose*

	Client attitudes towards dose

10.0 HOW ARE OUTCOME DATA LINKED TO THE UTILISATION AND COST INFORMATION?

The primary objective of the outcome monitoring system is the gradual improvement of outcomes through changes to the delivery of services. Implied in this objective is improved cost-effectiveness of services, whereby equal or higher outcomes are achieved at lower cost. The achievement of this objective rests on the development of an overall information system that links data on service utilization, costs and outcomes for specific sub-groups of clients.

At the analysis stage the outcome monitoring system must be well linked to measures of service utilization and treatment process. The cost of treatment is another way to represent service utilization, but in units of measurement that are of high importance to funders and administrators. Information systems that include an ongoing assessment of unit and per client costs are relatively recent in the community sector of health and social services. Such systems have been referred to as "third-generation" information systems to highlight their uniqueness. The methods for costing health care services are well-established,[157] but little experience has been gained in their application with substance abuse services. The development of costing protocols for substance abuse services that are appropriate for large-scale monitoring systems is a very new development, and few monitoring systems currently in the field include a comprehensive costing component. French and colleagues have developed an instrument known as DATCAP and it holds considerable promise for wide scale application.[158] The DATCAP, however, is essentially a "top-down" approach to calculating cost per client and is not sensitive to the highly individualized treatment plans that are the norm within many outpatient substance abuse services. When the time and other resources "consumed" by a client are highly variable, a "bottom-up" approach to costing is more appropriate. This must include a workload measurement

system that records client-specific utilization of different categories of service. In their pilot work for the Ontario outcome monitoring system such a costing protocol is being used in conjunction with a slightly modified version of the DATCAP.[159] To date, the analysis plans for integrating utilization, cost and outcome data have borrowed heavily from methods of economic evaluation used in the health care sector. For example, cost-effectiveness analysis can compare alternative interventions or service delivery models on the cost per unit gain in outcomes. Considerable caution is needed in conducting such analyses since the evaluation design does not involve random assignment and important problems such as client selection cannot be ruled out.

Further, cost-effectiveness analysis requires the selection of a "primary" outcome measure. A monitoring system includes a host of measures that could be used as the primary outcome measure in the analysis, and the availability of multiple measures may contribute to the temptation to "mine" the data for positive results. Cost-effectiveness analyses are also typically conducted from the societal perspective and, therefore, require calculation of client and family opportunity costs (e.g., travel time, time lost for work). Such costs may be substantial for some levels and types of care. Cost analyses conducted only from an accounting rather than societal perspective will result in unfair comparisons across service providers. An instrument like the DATCAP collects information from both perspectives.[158]

Finally, the observational nature of the evaluation design requires that a great deal of attention be given to grouping clients into homogenous sub-groups so that comparisons across providers, and over time, are based on clients with similar characteristics. In the institutional sector this is referred to as the case-mix problem. Costing analyses in the hospital sector have focused on the prediction of service utilization (basically

length of stay) for particular case-mix groupings. This has yielded the well known Diagnostic Research Groups (DRG's) and Case-mix Groups (CMG's) which establish the funding base for hospitals in many developed countries. These groupings are based on the ICD classification of patient diagnoses. However, case-mix groups based on diagnosis predict only a small amount of variance in service utilization and costs in acute hospitals. They perform even less well for psychiatric and substance abuse services.[160] It is now widely recognized that the client groupings must include measures of client functioning and severity instead of, or in addition to, diagnoses.

A given outcome monitoring system can develop its client groupings for cost analysis based on the measures used in its baseline or follow-up interviews. However, it is also desirable to benchmark costs and outcomes across monitoring systems, and this requires a common set of outcomes and measures for case-mix grouping. An internationally recognized classification system is needed and one which is based at least in part on functional and severity measures appropriate for substance abuse disorders. The revised International Classification of Impairment, Disability and Handicap that is currently being field tested by the World Health Organization may hold some promise in this regard.

Finally, with respect to the integration of data on utilisation, costs and outcome, monitoring systems hold considerable promise for showing the cost-offset of substance abuse treatment; that is the reduction in costs associated with the utilization of health, correctional and social services that follows participation in treatment. Most published offset studies are based on large databases from insurance providers, which may bias the sample towards more affluent subgroups of the population. This selection bias leaves questions unanswered about the generalisability of the results to all clients in the treatment system. The representative nature of the sample followed-up in an

outcome monitoring system obviates this concern. In addition, the results from these analyses typically yield strong arguments in favour of the investment in substance abuse treatment. Thus, it is highly desirable for purposes of advocacy to obtain these results from within one's own treatment and broader health care system.

Where the data concerning the utilisation of health and other services is obtained from client self-report during the baseline and follow-up interviews, it is very important to do so only with a follow-up period of one to two years. Treatment often leads to a short-term increase in health care utilization, and the cost-offset is not usually achieved until two years have lapsed post-treatment. The alternative is to base the analysis on record linkage, for example to hospital and physician utilization records, after the outcome system has been operational for at least two years.

10.1 What Is The Relationship To Information Systems For Other Systems Of Care?

The establishment of system boundaries is one of the first steps in the design and development of outcome monitoring systems. In some instances, this process is made easier by a funder deciding that only services that fall under their jurisdiction are required to participate. One issue that often arises as a result of the multiple funding sources of many substance abuse services is whether an agency that receives only partial funding from the sponsor of the monitoring system must report on all clients (and costs), or only those in specific sub-programs. In addition, there is often a blurred distinction between some health promotion and treatment programs, particularly those aimed at early identification of non-dependent problem drinkers. A decision must be made regarding their inclusion, as well as "education" programs for "drink drivers".

The boundary of the substance abuse treatment system is even more difficult to

distinguish from that of the mental health system. Substance dependence and abuse are classified as mental health disorders and a large percentage of clients seen in the mental health system have these disorders. Many mental health services have specialised substance abuse counsellors. Thus, psychiatric and community mental health services might legitimately be included within substance abuse outcome monitoring systems. This would mean a re-visiting of many conceptual and methodological issues (e.g., expectations of " acute treatment" versus "ongoing community support"; need for face-to-face interviews; timing of outcome assessment for people involved in a program for many years. Many of these issues have been dealt with in the development and dissemination of the PSR-Toolkit.[161]

Lastly, broader processes of health care reform typically involve a review and modification of health-related information systems. To the extent that substance abuse services are part of larger health, mental health, and social service systems, they may be required to participate in more than one information system. Indeed, it is not uncommon for the design specifications of performance measurement systems to be eclipsed by revisions made to a larger system. At present, this will probably not affect outcome measurement since so few large-scale information systems are oriented in that direction. However, mandatory changes to the coding of client characteristics and utilisation data can have a major impact on the ability of statistical models to predict outcome. In Ontario, for example, a provincial case-mix project that began in the hospital sector has clear intentions to expand into the community mental health and substance abuse sector. This may involve a new mandatory assessment instrument for developing client groupings. Other national efforts to standardize information in the community health sector are also underway. The best advice that can be offered to the substance abuse sector is to stay as informed as possible, and offer to participate in the development of the larger system. It is then

possible to lead rather than follow other systems design.

10.2 What Is The Future Of Outcome Monitoring Systems?

This review has focused on outcome monitoring systems that span different levels of care under one administrative entity, or different independent service providers. These systems have developed largely in response to the failure of the traditional, clinical research paradigm in addressing the important questions that arise in delivering services along a continuum of care model. What does the future hold? What factors will facilitate ongoing system refinement, and what barriers and challenges are likely to impede progress, or lead to questions about the overall utility of the new paradigm?

10.2.1 Facilitating factors

- The increased adoption of managed care models (as in the U.S.), and the trend toward administrative mergers of formerly independent service providers, will continue to create a high demand for system-level evaluation and monitoring information;
- funders and administrators will be faced with the inverse relationship between data quality and the financial resources devoted to outcome monitoring. Savings from health care reform are likely to be invested, at least in part, in information technology. This will gradually improve the use of computing and communication technology in the field;
- larger reform of the health care system is likely to place more demands on the substance abuse field to conform to common data elements for the purpose of record linkage. This will improve our understanding of the inter-relationship between the substance abuse treatment system and larger systems. It will also yield more powerful data showing the economic impact of alcohol and drug

abuse and the cost-offset of treatment;

- a gradual integration of mental health services and addiction services is occurring internationally. This is producing pressure for a common classification system for case-mix and cost analyses for comparative purposes. It is too early to be optimistic about finding an international or even national, case-mix protocol. Indeed, the pressure to transfer diagnostic-based models for case-mix from the hospital sector to the community care sector is likely to slow progress at developing an appropriate classification system;
- the international research community will (eventually) recommend core outcome measures and cost protocols to improve comparability across monitoring systems. This will give administrators and funders real system-level benchmarks; and
- finally, on the optimistic side, the collaborative work of health services researchers, policy makers, funders, administrators, and service providers in developing outcome monitoring systems will improve communication across these stakeholders and better integrate the functions of research, development, and dissemination in the substance abuse field.

10.2.1.2 Barriers and challenges?

While progress is likely to be made on standardisation of a core set of measures and "best practices" for outcome monitoring, progress is likely to be slow. The slower the progress in this crucial area, especially within a given country, the more likely it is that the information systems for the substance abuse field will be eclipsed by larger health information systems and inappropriate, largely institutional models applied to this sector. A clear statement of the research potential of these large-scale monitoring systems is needed to address important questions for health services research. More priority to the research needs will also help make the case for reliable

and valid measures, and more comparative data. The current state of information technology is a significant barrier. The lack of computers within treatment programs, and fear of their use, is a major barrier to implementing workload measurement systems and on-line data collection for evaluation and monitoring purposes

The long-history of 'laissez-faire" in the funding and management of substance abuse services in many jurisdictions has created considerable resistance to system-level planning and management. For some program managers, the idea of outcome-based funding is still a foreign concept. What outcome-based funding formulas will look like is far from known — but it is a very solid bet that outcome-based funding is just around the corner in most countries.

Finally, the ultimate test of these outcome monitoring systems will be their contribution to decision-making regarding accountability issues, resource allocation, and improvements to service delivery and system functioning. We know that evaluative data are but one element in the decision-making process and there are many barriers to effective use of evaluation findings. It will be important to have reasonable expectations of these monitoring systems, especially in this early stage of their development.

In the Australian context, particularly in New South Wales, the ground is very fertile for the development of routine outcome monitoring. There have been significant increases in funding of alcohol and other drug services with a greater emphasis on accountability. Concurrently, there has been the introduction of the New South Wales Data Set that has standardised the collection of descriptive and process data on clients. This has paved the way ideologically and logistically for the pragmatic collection of treatment outcome data as long as it is brief, valid and appropriate.

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