Interventions
Supported by Scientific Evidence
for Substance Abuse Treatment, Harm Reduction
and Prevention

Interventions Supported by Scientific Evidence for Substance Abuse Treatment, Harm Reduction and Prevention

Prepared for the Addictions and Mental Health, Community Programs Directorate, and the First Nations and Inuit Health Branch of Health Canada

by

Alan C. Ogborne, PhD., Angela Paglia-Boak, M.A., and Greg Graves, M.A.[1]

[1] Alan Ogborne is an Associate with the Canadian Centre Substance Abuse (CCSA), Angela Paglia-Boak is in private practice and Greg Graves is the Coordinator of Best Practices and Training at CCSA.

Table of Contents

1. Introduction

Background

This report was prepared in response to a request from the First Nations and Inuit Health Branch (FNIHB), Health Canada, for a concise synthesis of the evidence for the effectiveness of interventions to prevent, treat or to reduce harms associated with substance abuse and for best practice recommendations. The report is intended to serve as a reference for a national experts meeting focusing on the National Native Alcohol and Drug Abuse Program (NNADAP). With a few exceptions, the evidence on the effectiveness of the interventions considered comes from studies that have not specifically targeted First Nations or Inuit communities or individuals and the generalizability of the results to these peoples needs further research. However, a wide range of individuals and communities have been involved in treatment and prevention research studies and this research suggests that empirically supported interventions are relevant for a wide range of persons and communities.

Method

This study draws on reports and publications aimed at assessing the effectiveness of alcohol and drug abuse[2] treatment, harm reduction and prevention measures and programs.

- The section on treatment includes pharmacological and psychosocial interventions that targeted specific individuals and where the goal was either complete abstinence or reduced and less harmful levels and patterns of use.

- The section on harm reduction focuses on needle exchanges, supervised injection rooms and outreach harm reduction initiatives that aim to reduce drug-related harms among groups of active injection drug users. Other non-abstinence interventions for injection drug users, such as the prescription of heroin, methadone and other substitute drugs, are considered in the section on treatment.

- The prevention section includes initiatives that targeted communities or identifiable high-risk groups with the specific aim of reducing the risk of substance abuse problems either by promoting complete abstinence or low risk use.

For each type of intervention, we first sought to identify recent comprehensive reviews and meta-analyses[3] of empirical studies and then searched for the reports of significant studies published after these reviews were completed. For the section on treatment, we also identified a number of useful reports that were published on the Internet. The greatest attention was paid to peer reviewed reports and publications. Priority was given to peer reviewed studies with control or comparison group designs as these are the most appropriate for assessing the relative effectiveness of different interventions. These designs are briefly reviewed in Appendix A.

[2] Except tobacco.

[3] These involve statistical analyses of results from multiple studies.

Reports and publications were identified through searches of databases maintained by the Canadian Centre in Substance Abuse, the National Institute on Drug Abuse (ETOH), Dartmouth University (CORK), the Educational Resource Information Centre (ERIC) and two commercial databases (CANBASE and MEDLINE).

Summary of Results

Tables 1 to 5 show the authors' assessment of the evidence for the effectiveness of specific types of treatment, harm reduction and prevention interventions and indicate the types of evidence considered. Given the diversity of studies considered it was not possible to use the same assessment scheme for all topic areas, therefore there is some variation on how evidence is presented in each table. In all cases, the main concern was with evidence that showed the impact of the intervention on alcohol or drug use and related problems. Some interventions may also have other benefits but these were not considered when constructing the summary tables. It is important to note that the highest standard of evidence, "very good" or "good," is demonstrated when the results from several well controlled or experimental studies support the intervention under study.

Given the significant contextual and methodological differences between most of the studies considered for this review, it is not generally possible to offer global statements about the magnitude or durations of the effects of specific prevention, treatment or harm reduction interventions. This would require new meta-analyses that are beyond the present scope of work. Meta-analyses of studies of motivational interviewing and brief interventions indicated small to moderate effects sizes for up to 12 months post treatment (Moyer, et al., 2002; Burke, Arkowitz and Menchola, 2003). This means that for some outcome measures (e.g., alcohol and drug consumption, psychological and social adjustment), one could expect to find a 10 to 26 percent difference between those treated and those untreated, after a one year period

Table 1: Evidence ratings for the effectiveness[4] of treatment interventions

Type of intervention[5]	Rating of evidence for effectiveness
Pharmacotherapy for people with alcohol problems (especially Acamprostae, Disulfiram, Naltrexone) with appropriate psychosocial interventions	**Very Good:** Positive results from experimental studies.
Methadone maintenance for chronic opiate users	**Very Good:** Positive results from experimental and other types of studies conducted in a variety of countries and settings.
Motivational interviewing	**Very Good:** Evidence from experimental and other types of studies suggest that this is effective as an alternative to no treatment or as a component of more intensive treatment for people with alcohol and drug problems. Some overlap between studies of motivational interviewing and those concerned with brief interventions.
Relapse prevention based on the Marlatt model	**Very Good for people with alcohol problems:** Positive results from many experimental studies. **Promising for people with drug problems:** Mixed results from three experimental studies.
Structured self-help materials for problem drinkers	**Very Good for people with alcohol problems:** positive results from experimental studies and well controlled comparison group studies. Self help materials are a feature of some brief interventions and sometimes the only feature.
Community reinforcement	**Good – Very Good:** Positive results from experimental and other types of studies. Also shown to reduce the use of cocaine among people on methadone.
Skills training	**Good – Very Good for people with alcohol problems:** In 15 of 21 experimental studies, patients with alcohol problems who received skills training had better outcomes than others. In the remaining 6 studies, the outcomes for those who received skills training were the same as for others. **Promising for people with drug problems:** One large-scale study had mixed results with young males who had completed a residential treatment program.
Behavioural counselling	**Good:** A number of large-scale comparison group studies indicate that various kinds of outpatient, drug free psychological/counselling treatments contribute to positive changes in substance use and other behaviours among people who use opiates, cocaine, amphetamines, cannabis and adolescents with various types of drug problems.
Couples or family therapy based on behavioural principles	**Good:** Positive results mainly from comparison group studies and meta analyses. May not be more effective than individual treatment but family involvement may be a critical ingredient of Community Reinforcement.
Self-help group as relapse prevention resources	**Fair:** Involvement with Alcoholics Anonymous or Narcotics Anonymous correlated with positive long-term outcomes for those who have become sober and drug free through formal treatment. Self selection may be a factor as specific client types show success.
The Matrix Model	**Suggested for methamphetamine users and cocaine users**
Cue exposure	**Not consistently supported**
Covert sensitization	**Not supported**
Acupuncture	**Not supported**
Psychotherapeutic approaches	**Not supported**
Treatments based only on AA steps and traditions	**Not supported**
Education, hypnosis, chemical aversion therapy, electrical aversion therapy, and videotape confrontation.	**Not supported**

[4] Relative to no treatments or to other usually less structured forms of treatment.

[5] Brief descriptions of these interventions are provided in Chapter 2.

Table 2: Evidence ratings for the effectiveness of various aspects of treatment interventions

Aspects of treatment	Rating of evidence for effectiveness
Brief interventions	**Very Good:** Positive results from experimental studies that mainly involved people with less serious problems. See also motivational interviewing and self-help materials.
Multi-component services that match the needs of diverse clients	**Very Good:** Positive results from experimental studies.
Has aftercare programs	**Good:** Positive results from experimental and other studies.
Treatment by competent counsellors with good counselling skills	**Fair:** Supported by common sense and evidence is mainly from non-experimental studies.
Inpatient treatments	**Not supported as cost-effective for general populations**
Treatments with abstinence as a primary goal	**Insufficient research focused on this area.** Abstinence and reduced drinking/drug use are often considered as evidence of success. In general, treatments with flexible and individualized goals have the greatest empirical support.

The present review was more limited in scope than that leading to the report on *Best Practices: Substance Abuse Treatment and Rehabilitation* published by Health Canada in 1999. For example, the current review does not consider treatments for distinct populations or treatment system issues. There are also a few differences in the ways specific treatments are classified in Tables 1 and 2 as compared with the Health Canada report[6]. Overall, the current review clearly supports the 1999 Health Canada report but also extends or refines some of the best practice statements, as outlined in Table 3.

It is not certain that these practices will be appropriate for members of First Nations or Inuit communities or other special populations because there has not yet been a sufficient body of well-controlled outcome research conducted on these groups. However, the only individual factors shown to have a significant influence on treatment outcomes are problem severity, social support and mental health status and these are highly variable in all populations.

This review also indicates support for three additional best practice statements:

1. There is strong support for motivational interviewing as an alternative to no treatment or as a component of more intensive treatment for people with alcohol and drug problems.

2. There is good support for the provision of aftercare once formal treatment is completed.

3. Self-help material can assist problem drinkers seeking help to reduce their consumption and may also be of value to drinkers identified through screening as being at risk.

There is also increasing evidence that treatments supported by these best practice statements are cost effective especially when delivered on an outpatient basis and in group settings. Some global analyses of prevention and treatment interventions also indicate that their economic benefits exceed their costs (Rydell and Everingham, 1994; Belenko, Patapis, and French (2005).

[6] These differences reflect trends in the literature. Stress management and self control training now tend to be regarded as forms of skills training while motivational interviewing has received more attention as a distinctive intervention.

Table 3: Refinements to best practice statements in the Health Canada report (1999)

Best practice statements from Health Canada report	Proposed refinements indicated by present review
1. There is a definite role for pharmacotherapies, if used in a controlled setting, as an adjunct to other forms of treatment. Those drugs, which have addictive potential, must be used with caution and monitored on a regular basis. Selective use of Disulfiram by socially stable, motivated clients, as an adjunct to comprehensive therapy, is supported by the literature. Naltrexone can be an effective adjunct to other forms of treatment by reducing craving for alcohol. Methadone, in adequate doses and with supportive therapy, is effective in reducing illicit opiate use, criminal activity and HIV transmission. Therapy involving methadone can improve social functioning, physical health and productivity and, in certain instances, can lead to cessation of heroin use. Better outcomes are achieved with longer retention in treatment.	**Addition:** When used appropriately Acamprostae significantly increases the rate of complete recovery for some people with alcohol problems,
2. There is some support in the literature for behavioural relapse prevention programs for smokers and people with alcohol problems. The literature also provides support for the effectiveness of behavioural self-control therapy for those with less severe drinking problems, as a cost-effective alternative to extensive therapist-led approaches, and of behavioural contracting in the context of a comprehensive treatment program.	**Modify as follows:** There is good support for behavioural relapse prevention programs for smokers and people with alcohol problems. The literature also provides support for the effectiveness of behavioural sills training (social skills, self-control skill and relaxation skills) especially for people with alcohol problems
3. The community reinforcement approach has consistently been shown to be effective, particularly with clients having fewer social supports and more severe drinking problems.	**Continues to be supported by the literature**
4. Marital therapy, particularly marital behavioural therapy, in both brief and extended formats, is well supported by research.	**Continues to be supported by the literature**
5. Social skills training is strongly supported by research, particularly with problem drinkers.	**Encompassed in changes to #2**
6. There is good support for stress management interventions as a component of treatment for alcohol problems.	**Encompassed in changes to #2**
7. Although the literature does not yet provide strong evidence by which to match clients to specific treatment interventions, it does not mean that all clients require the same types of services. A variety of flexible and individualized services are required and guidelines for the selection of appropriate services are needed.	**Continues to be supported by the literature**
8. Consideration should be given to providing treatment in a group format unless otherwise contraindicated.	**Continues to be supported by the literature**

Best practice statements from Health Canada report	Proposed refinements indicated by present review
9. Research continues to support the relative cost-effectiveness of treatment provided on an outpatient basis to that provided on a residential basis, but this does not deny that some people with substance use problems need short- or longer-term supportive accommodation. However, those who are provided this type of accommodation could still benefit from participating in outpatient or day programs for help with substance abuse and other problems.	**Continues to be supported by the literature**
10, Intentionally brief interventions (up to eight sessions) appear to benefit socially stable, low to moderately dependent people with alcohol problems. Other people with alcohol problems may need longer-term treatment but the lower and upper limits for cost-effective treatment have not been established. Several studies have shown that treatment of shorter duration is as effective as that of longer duration.	**Continues to be supported by the literature**
11. Better treatment outcomes have been achieved for clients with fewer problems and more resources. This indicates the need to research and develop effective interventions for those who currently have a poorer prognosis.	**Continues to be supported by the literature**
12 Appropriate therapies by competent counsellors with strong interpersonal skills, such as empathy and the ability to forge a therapeutic alliance with the client, is associated with an increase in positive treatment outcomes.	**Continues to be supported by the literature**

Table 4: Ratings of evidence for various harm reduction interventions

Types of interventions	Rating of evidence
Syringe exchanges	**Good:** Results showing limitations on the spread of HIV/AIDS and Hepatitis C from two or more controlled comparison group studies involving appropriate comparison groups and using appropriate statistical controls.
Outreach harm reduction education	**Fair – Good**: Anecdotal evidence and some comparison group studies involving appropriate methods and statistical controls indicate public health benefits
Supervised injection sites	**Promising:** Evidence for public health and public order benefits is mainly anecdotal or impressionistic. This may change as more results become available from the ongoing evaluation of the Vancouver site.
Campaigns to encourage drug users to call emergency services in case of poisoning or overdose	**Has not yet been formally evaluated**
Provision of training and information for drug users on overdose prevention and management.	**Has not yet been formally evaluated**
Provision of Naloxone to drug users and others for use in emergencies	**Has not yet been formally evaluated**
Laboratory testing services for illicit drug purity and potency	**Has not yet been formally evaluated**

When considering these best practice statements and reviewing Tables 1 and 2, it is important to note that a variety of treatment-related issues and other factors can influence treatment outcomes (see pages 28-33). It is also important to note that research on treatment is continuing and that more research is needed on real-world clinical services as well as research on treatments in controlled settings. Finally, as stated in Health Canada's 1999 review, *Best Practices: Substance Abuse Treatment and Rehabilitation*, current evaluations may not fully account for the effects of all therapies. Many are complex and may have multiple effects and interactions with characteristics of those treated. Further "goal-based" behavioural and pharmacological treatments are inherently easier to evaluate than those based more on individual needs.

Table 4 summarizes the evidence for interventions designed to reduce harms related to injection drug use and suggests best practices.

There is good evidence that syringe exchanges can limit the spread of HIV/AIDS and Hepatitis C. The United Nations Office for Drug Control (2002) recommends syringe exchanges as part of a comprehensive package of prevention and care, including the potential for outreach services, HIV/AIDS education, access to condoms, drug dependency treatment, voluntary HIV testing/counselling, and psychosocial support. Further, the UN General Assembly Special Session on HIV/AIDS declaration states that effective prevention, care and treatment strategies require non-discriminatory access to "vaccines, condoms, microbicides, lubricants, sterile injecting equipment, drugs, including antiretroviral therapy, diagnostics and related technologies, as well as increased research and development." The UN set the following goals by 2005: "[To] ensure that a wide range of prevention programs which take account of local circumstances, ethics and cultural values, are available in all countries … including… expanded access to essential commodities, including sterile injecting equipment" (paragraphs: 23 and 52).

There is also some empirical support for the public health benefits of outreach services and supervised injection sites. However, it is widely recognized that to be of real value these services

must be part of a comprehensive "four pillar" approach to substance abuse that includes prevention, harm reduction, law enforcement, and treatment. In addition, good relationships with the police and other social and community services are essential. This approach also requires collaboration with local stakeholders to determine the appropriateness of these services in different situations. Ongoing, independent evaluations are also needed to ensure that service delivery and outcome objectives are met in light of changing needs and circumstances.

Table 5 summarizes the evidence for interventions designed to prevent substance abuse. The vast majority of the prevention literature centres around alcohol and tobacco use strategies aimed at youth. Studies have evaluated the impact of programs delivered across a range of settings, including school, family, mass media, regulatory, and community settings. Most programs either target a whole population (universal) or a group of people at high-risk for use or abuse (selective).

There are numerous methodological criteria to consider when searching for exemplary prevention studies. Apart from randomization and use of a control group, other components of a rigorous study include: demonstration of comparability of groups at baseline; use of valid behavioural measures; large, representative samples; sufficient follow-up period of at least 12 months; low attrition rates (no more than 30 percent after 12 months) with checks for differential attrition between groups; control for extraneous factors that may threaten validity; fidelity to the program; and report on all targeted behavioural outcomes (including negative results). To generate a systematic rating system that considers all these elements is beyond the scope of this review. However, the basic classification system used in Table 5 took into account the quality of the individual studies based on the criteria above and the extent of replicated effectiveness across different types of samples. A rating of "very good" indicates strong study methodology coupled with repeated positive outcomes in numerous studies; "good" indicates adequate methodology coupled with some positive, but some negative outcomes, or strong methodology coupled with a smaller number of studies showing positive outcomes; "promising" indicates strong methodology, but requires replication to show robustness. "Not very effective" indicates the positive outcomes were not found.

Table 5: Effectiveness of different types of prevention interventions

Type of prevention intervention	Rating of evidence for effectiveness
Alcohol policies that reduce the economic and physical availability of alcohol (i.e., raising the price of alcohol, restricting hours or days of sale, restricting outlet density, responsible beverage service)	**Very Good:** Numerous experimental and quasi-experimental studies conducted in many countries have shown decreases in alcohol consumption and alcohol-related harms when properly enforced; young users and heavy users are also affected.
Drinking and driving countermeasures (i.e., random breath testing, lowered blood alcohol limit, zero-tolerance laws for young drivers and graduated licensing)	**Very Good:** Numerous experimental and quasi-experimental studies of measures to prevent drinking and driving have shown effectiveness when properly enforced.
Comprehensive community programs	**Very Good:** Among the few long-term experimental studies conducted to date, all have shown that multi-component community programs that centre upon alcohol policies coupled with police enforcement and media campaigns (family and school programs may also be included) can prevent alcohol-related harms in the community. There is also evidence that drinking behaviours can be affected, but these effect sizes are relatively small.
The Strengthening Families Program (SFP)	**Very Good:** Several long-term experimental studies in various cultures have shown that the SFP can prevent or reduce substance use among children in high-risk and low-risk families. It can also reduce substance use among parents who misuse**.**
School-based programs	**Good**: Several long-term experimental studies have shown that school-based programs based on the social influence model (i.e., normative education) that provide relevant, factual information about short-term risks of use can delay substance use among adolescents or temporarily reduce use among users; note that any preventive effects are small in magnitude.
Alcohol harm reduction programs for youth (brief intervention and instructional methods)	**Good:** Preventing alcohol-related harm is a relatively new area of study that is showing good results thus far. Marlatt's study of brief intervention with young heavy drinkers has shown long-term effectiveness [Add ref. here? (Marlatt, et al 1998). Another long-term experimental study assessing the school-based School Health and Alcohol Harm Reduction Project (SHAHRP) has shown decreases in alcohol-related harms as well as consumption among adolescents.
Brief interventions with high-risk pregnant women and women of childbearing age	**Good:** A few experimental studies have shown that brief interventions can prevent or reduce drinking during pregnancy.
School program for Native American youth (Schinke et al., 2000)	**Promising:** An experimental study of a culturally tailored school program designed for Native American youth in the United States showed reductions in substance use among students over the long term; further study is needed before this program can be recommended.

Type of prevention intervention	Rating of evidence for effectiveness
Parental Adolescent Transitions Program for low-risk and high-risk families (Dishion et al., 2002)	**Promising:** One experimental study of a combined universal and selective parent program called Adolescent Transitions Program (ATP) carried out within the school context showed reductions in substance use among adolescents; further study is needed before this program can be recommended.
Broad healthy child development interventions	**Promising:** Broad-based childhood development programs that seek to reduce the risk factors and increase the protective factors that contribute to a vast array of problem behaviours (e.g., substance abuse, risky sexual activity) during adolescence and adulthood are currently being implemented and show promising results thus far; further research is being conducted.
Mass media campaigns	**Not Very Effective**: The very few experimental studies conducted show that media campaigns cannot affect consumption, but can increase knowledge, awareness of a problem, and support for other interventions used.

The prevention research suggests that universal interventions may be most appropriate in the case of alcohol due to the "prevention paradox" which refers to the observation that the bulk of the population who are at average-risk collectively experience more harm from drinking compared with the smaller number of heavy or dependent users. This paradoxical pattern suggests consumption be moderated among the majority using broad environmental approaches. Thus, alcohol prevention strategies that target a whole population, such as policies or school-based education, are more effective in preventing or reducing harms in a community compared with selective prevention approaches that target only high-risk groups. An intervention that targets many groups simultaneously is also more cost-effective.

Among all the strategies used to prevent or reduce alcohol use and related harms, the studies of alcohol policies are the most methodologically sound, consistent, and widespread. As a result, greater confidence can be placed in the alcohol policy findings. Policies work directly and indirectly by reflecting social norms and what is and is not acceptable. For any new regulation to work, there must be sufficient enforcement and increased public awareness through media campaigns.

Policies and regulations that strengthen control over the availability, sale, promotion, and distribution of alcohol are highly effective in reducing per capita consumption and harms. The policy that is most supported by the evidence is increasing the price of alcohol through taxation. Other proven policies include restricting hours or days of sale, and restricting the density of alcohol outlets in a community. Regulating alcohol availability can have large positive effects in a community at a relatively little expense.

Although raising the minimum legal drinking age can reduce alcohol use and harm among youth, this is not a viable option for local community groups. However, the enforcement of laws against alcohol sales to minors and the use of media to raise public awareness are effective ways to reduce underage drinking.

Responsible beverage service can reduce intoxication and related problems in the local community. Drinking and driving can be reduced by the following countermeasures: highly visible checkpoints for random breath testing, lowered blood alcohol limits (e.g., set at .08 or .05); zero-tolerance laws for young drivers, and graduated licensing for new drivers.

The few good community-wide prevention interventions reviewed sought to reduce alcohol use, misuse and related harms. One commonality among these trials was that they all implemented and enforced local alcohol policies and used the media to increase awareness and support in the community. Some also included universal school and parent components. The evidence shows that community-wide interventions are not as effective in reducing alcohol use or heavy use as they are in reducing related harms such as traffic crashes and violence. Such programs require political will, partnerships between a diverse range of community agencies, and public support in order to be effective.

A substantial amount of evidence has accumulated to support the use of the Strengthening Families Program (SFP) in preventing substance use among children and parents. The SFP has

shown long-term efficacy, both as a universal program and a selective program targeted to high-risk families.

School-based programs based on the social influence approach can, at best, delay the onset of substance use among adolescents for a short while or reduce use among some current users. Delaying initial use is a worthwhile endeavor, given that early use of alcohol or illicit drugs is strongly associated with heavy consumption, dependence and other future problems. At minimum, any school program should include normative education, factual information about short-term risks of use, and interactive delivery methods. It is important that the program be relevant to the experiences of youth and also age and culturally appropriate. Indeed, there is promising research using a culturally tailored program designed specifically for Native American youth, as a long-term study found reductions in substance use among students receiving the program.

It is likely that the poor results found in the majority of school-based programs are due to the intrinsic message of abstention. When the goal of a program is alcohol harm reduction, the few studies conducted have shown reductions in heavy drinking and alcohol-related harms among youth over the long-term.

Regarding the prevention of fetal alcohol spectrum disorder, there is sufficient evidence showing that brief interventions provided to pregnant women and women of childbearing age who are at high-risk can successfully reduce alcohol intake during pregnancy.

While there are still many gaps in the prevention literature, much has been learned over the past three decades. Experts agree that single component prevention strategies are not sufficient in any preventive effort. Ideally, a community would implement and enforce restrictive alcohol policies, use mass media to raise awareness, use school programs, and offer a program such as SFP to families. A community-wide prevention strategy would serve to change the overall social and cultural environment surrounding substance use and benefit the whole population. The notion of altering the environment to achieve positive outcomes is the underlying tenet of a recent paradigm shift in prevention research. This is a move toward more, comprehensive interventions that aim to both reduce developmental risk factors and enhance protective factors in order to prevent multiple problem outcomes.

2. Evidence-based Practices in Substance Abuse Treatment

Goals of Treatment and Measure of Success

The interventions presented are aimed at helping clients reduce their use of alcohol or drugs or to achieve and maintain complete abstinence. This standard is consistent with recent controlled studies that focus on multiple and usually continuous outcome measures on drinking and drug use related behaviours (e.g., percentage of drinking days, amount consumed per drinking occasion, problem free days) instead of abstinence alone. It is also of note that the reviews and studies considered did not explicitly focus on the relative effectiveness of abstinence-only versus other interventions. The evidence tends to support interventions with flexible and individualized goals that can engage people who may not be completely abstinent and those who relapse.

In addition to a goal concerning alcohol and drug use many treatment programs also seek to improve their client's health and social function and to reduce antisocial behaviour. It has therefore been proposed that the effectiveness of treatments should be judged against outcome domains relevant to the rehabilitation of the patient and public health and safety (United Nations International Drug Control Programme, 2002). These criteria include the elimination or reduction of alcohol or drug use, improved health and social functioning, and reduction in public health and safety threats. Some studies have included measures relevant to each of these goals and there is evidence that post-treatment reductions in alcohol or drug use are associated with improvement in mental health, employment and criminality. However, the literature as a whole does not lend itself to analyses concerning the attainment of multiple treatment outcome objectives. Thus, in the present study the main concern is with post-treatment reductions in alcohol or drug use and related problems.

The focus here will be on studies involving general populations. If there is evidence that a treatment is especially effective or ineffective for specific groups or types of people this will be mentioned and patient-treatment matching will be considered under a separate heading. There is some literature on programs for youth that will be noted. However, studies of treatment interventions specifically designed for women or other distinct populations (e.g. people with concurrent disorders, First Nations, seniors, gays and lesbians) are beyond the present scope of work. There is, in fact, very little research on treatments for most special populations although advice on best practices is readily available (e.g. Health Canada, 1999, 2000, 2001, 2002a, 2002b, 2002c, 2002d; Harrison and Carver, 2004).

Screening and Assessment

The treatment interventions reviewed were primarily designed for people seeking help from specialized services. In some instances, the reviews included people identified as problem drinkers/drug users when screened in other settings (e.g. social service agencies, hospital emergencies departments, doctors' offices). A variety of methods are used to screen and conduct an in-depth assessment of people with alcohol or drug problems. Some of their advantages and limitations are noted in Health Canada's report on best practices in the treatment of concurrent disorders (Health Canada, 2002b)[7].

[7] The recommendations for screening and assessment included in this report are appropriate in a variety of settings.

Two levels of screening or assessment are recommended when treating a client. The purpose of Level 1 is to identify possible cases and Level 2 is to assess the severity of substance use problems. Options for Level 1 include asking a few simple questions, using one of several brief screening instruments (reviewed in Health Canada report and by Korhonen, 2004) or using a checklist of suspicious behaviours. A number of standardized assessment instruments are recommended for Level 2 assessment and these are described in the Health Canada report.

Detoxification

Most of the interventions considered below require detoxification of the client prior to treatment, sometimes for several weeks. Methods of detoxification include abrupt withdrawal (cold turkey), or gradual withdrawal with social support with or without medications. There is extensive literature on the use of medications during detoxification from alcohol or other drugs, much of it quite technical and this is considered beyond the scope of the present report. The limited literature on detoxification without the use of medications (so-called non-medical detoxification) indicates that this is appropriate in many cases. Non-medical detoxification centres have been a feature of Ontario's treatment system since the early 1970s. Although they were originally established to admit people with alcohol problems a study conducted in the 1980s showed that many also admit people with drug problems (Ogborne and Kapur, 1987).

Specific Treatment Interventions

Staff of the Australian National Drug and Alcohol Research Centre (NDARC) (Shand et al., 2003) recently undertook a comprehensive review of empirical studies of treatment for people with alcohol-related problems. This review also summarized the conclusions of earlier reviews of some types of interventions and will thus be the main source of information for this report. Some recent reviews of specific treatment modalities will also be considered.

There have been fewer studies of treatments for people with drug problems than for people with alcohol problems and many of these studies have not been well controlled. Reviews by Crits-Christof and Siqueland (1996) and the United Nations International Drug Control Programme (2002) were the main sources considered.

The headings used in this section are similar to those used in the Health Canada 1999 report, *Best Practices: Substance Abuse Treatment and Rehabilitation* (Roberts and Ogborne). This current report, however, uses a number of additional headings to encompass new treatment approaches and to reflect trends in the literature. The NDARC classifies skills training, community reinforcement, cue exposure, couples and family interventions and self-guided/self-help material as cognitive-behavioural treatment because they all assume that problematic alcohol use is a learned response to personal problems. The current report highlights each intervention separately to demonstrate the distinct types of impact they have on treatment. Many different types of treatment fall under the heading of psychosocial treatment and comprehensive overviews are included in the year 2000 World Drug Report (United Nations Drug Control and Crime Prevention, 2000) and in reports from the US National Institute on Drug Abuse (NIDA1999; NIDA2005). These interventions will be distinguished as much as possible in the current report. The report also explores research findings in the drug treatment field.

In practice, specific interventions are often delivered as part of comprehensive treatment programs that may include two or more of these interventions as well as interventions that address other client/patient needs. In this report, except where indicted, the focus is on the evidence the effectiveness of these interventions as a stand-alone treatment or as components of more intensive treatment programs.

Pharmacotherapy

Drugs Used to Treat Alcohol Dependence

Two types of drugs are sometimes used for the prevention of relapse among people dependent on alcohol: (1) antidipsotroic drugs that induce an unpleasant reaction when used with alcohol (Disulfiram and Metronidazole) and (2) drugs prescribed to reduce cravings for alcohol (mainly Acamprostae and Naltrexone). Many relevant studies have been published but a detailed summary is beyond the scope of this current review[8].

The following succinct summary is consistent with the evidence to date:

> Among all drugs used at different periods to treat alcohol dependence, Acamprostae, Disulfiram, and Naltrexone have the best documented effects. Acamprostae significantly increases the rate of complete recovery, while Naltrexone significantly reduces alcohol abuse but only when the drug is combined with an appropriate psychosocial protocol, such as coping skills therapy. Disulfiram (antabuse), which causes nausea and discomfort during alcohol consumption, is also documented as an effective method to reduce alcohol intake, but only when used under supervision. (Alho, 2002)

The NDARC review also indicates that Fluoxetine or Citalopram (serotonin uptake inhibitors), Atenolol (a beta blocker), Busprion (an anxiolytic) and Desipramine (a tricylic antidepressant) may also be helpful in some cases. More research is needed to determine the value of these drugs. Physicians who prescribe any of the drugs mentioned above will, of course, need to be aware of specific indications and contraindications and potential side effects.

Prescription of Heroin for Opiate Dependence

The medical prescription of heroin has long been a feature of heroin addiction treatment in Britain. However, few British doctors are licensed to prescribe heroin for addiction and most of these rarely do so. More recently, Switzerland has approved the medical prescription of heroin following an evaluation that showed heroin-assisted therapy as useful for helping some chronic users to stabilize their addiction, reduce criminal activity and lead more healthy and productive lives (Uchtenhagen, Gutzwiller and Dobler-Miklos, 1996). A recent controlled trial in the Netherlands that involved heroin for smoking also has some positive results (Van den Brink et al., 2003).

The potential value of heroin prescription in Canada is being tested in a controlled trial involving opiates users recruited from clinics in Vancouver, Montreal and Toronto. This project is known as the North American Opiate Medication Initiative (NAOMI). The aim is to test whether

[8] The NDARC report devoted 12 pages to a review of the evidence for the effectiveness of pharmacotherapies.

medically prescribed heroin can successfully attract and retain street-heroin users who have not benefited from previous repeated attempts at methadone maintenance and abstinence programs. The results will clearly be of considerable interest to those who favour or oppose this type of treatment.

Prescription of Methadone or Buprenorphine for Opiate Dependence

There is very good evidence that some people who use opiates will reduce their use of illegal opiates and improve functioning in other life areas when prescribed adequate doses of oral methadone. A review of methadone treatment by the Institute of Medicine (1990) in the United States concluded that methadone dosages should be individually tailored. The review also noted that patients maintained on higher doses (80 mg) generally do better than those on lower doses. There is also evidence that people on methadone benefit from counselling (Fiorentine, and Anglin). A recent study of the use of methadone in Amsterdam (Langendam et al., 2000) indicates that steadily increasing methadone dosages in a harm reduction setting may be useful in supporting users of injection drugs in the process of cessation and in reducing the spread of HIV infection.

Considerable differences exist among treatment programs that make use of methadone. Some are very flexible and make it easy for new and former patients to gain admission. These, so called "low-threshold" programs typically provide low doses of methadone (less than 60 mgs) and offer problem-based counselling. Other programs are more rigid with respect to enrolment and re-admission and require clients to submit to regular and supervised urine tests. These stricter programs are generally for older, long-term opiate users who have consistently failed to benefit from abstinence-based programs. Best practice guidelines have been published by Health Canada (2002a).

The use of rewards for abstinence from illicit drugs has been shown to reduce illicit drug use among clients of methadone maintenance programs (Silverman, 1996). These rewards take the form of vouchers that can be exchanged for goods and services, Their value increases with each consecutive drug-free urine sample provided A recent on-line review prepared for the US National Institute on Drug Abuse (NIDA, 2005) also indicates that the functioning of people on methadone can be improved with counselling, brief interventions, motivational interviewing and the use of techniques to help patients feel comfortable in discussing their personal experiences and to identify, and work through interpersonal relationship issues and to solve problems without recourse to drugs.[9]

Methadone prescription does not reduce injection drug use in all cases. Some people who inject drugs are reluctant to forgo the sense of euphoria (rush) that they experience when they inject heroin. Others report that methadone does not reduce the craving for heroin and has unpleasant side effects. Finally, those with a strong attachment to the act of self-injection are often reluctant to limit themselves to the use of non-injectable drugs. Injectable methadone has been prescribed in such cases in the United Kingdom and in Switzerland. This can reduce the user's need for heroin and thus the frequency with which heroin is injected.

[9] These techniques are labeled as "supportive psychotherapy" in the NIDA review.

The strictness of some methadone programs also limits their appeal for some addicts. More flexible programs are being developed in many countries in order to attract and retain more clients. In addition to the low-threshold programs, there are now programs that allow stabilized clients to withdraw from counselling and to have more take-home privileges.

One study from the United Kingdom (Best et al., 1999) showed that heroin addicts who continued to use heroin while involved in methadone treatment were more likely than others to use heroin opportunistically (i.e. when heroin was readily available) rather than to relieve withdrawal symptoms. The authors suggest that these opportunistic users are less likely than others to reduce heroin use in response to increased doses of methadone. The report on this study did not, however, indicate if subjects used heroin by injection or other means

Buprenorphine, another synthetic opiate has also been shown to be an effective maintenance drug (Ling et al., 1998). This has a lower risk for overdoses than methadone and the withdrawal symptoms are milder. A recent review of controlled studies indicated that "Buprenorphine is an effective intervention for use in the maintenance treatment of heroin dependence, but it is not more effective than methadone at adequate dosages" (Compton et al., 1995). The selected use of Buprenorphine in the treatment of opiate addiction is supported by the World Health Organization (WHO/UNODC/UNAIDS, 2004).

Other Drugs for Opiate Dependence

A review conducted for the highly respected Cochrane Collaboration[10] (http://www.cochrane.org) project reached the following conclusion about a long acting form of methadone known as LAAM (Levoalphacetylmethadol): "LAAM appears more effective than methadone at reducing heroin use. More LAAM patients than methadone ceased their allocated medication during the studies, but many transferred to methadone and so the significance of this is unclear. There was no difference in safety observed, although there was not enough evidence to comment on uncommon adverse events." Side effects are of concern (United Nations International Drug Control Programme, 2002).

A Cochrane review of studies of the opioid antagonist Naltrexone concluded that the available data did not permit a firm assessment but that this drug may be appropriate for highly motivated patients when used in conjunction with various psychosocial therapies. Naltrexone produces no euphoria but effectively "blocks" the effects of opiate drugs.

Drugs for Cocaine Dependence

There is no current evidence supporting the clinical use of a variety of drugs, including antidepressants, dopamine agonists, Disulfiram and Lithium in the treatment of cocaine dependence (de Lima et al., 2002; United Nations International Drug Control Programme, 2002).

[10] The Cochrane Collaboration is an international non-profit and independent organization, dedicated to making up-to-date, accurate information about the effects of health care readily available worldwide.

Psychosocial Interventions

Motivational Interviewing

The essential components of motivational Interviewing (MI) have been summarized in the following manner: "Motivational interviewing is a brief clinical method that addresses motivational struggles in behaviour change. The spirit of MI is characterized by a counselling style that is a partnership between the client and counsellor that honours the client's perspective and strengths. Counselling is client-centred, empathic and built on reflective listening that conveys the counsellor's acceptance of the client. The client is viewed as possessing the resources and motivation for change; the counsellor aims to elicit this intrinsic motivation from the client. Change is facilitated by focusing on discrepancies between present behaviour and important goals and values" (Brown, Donglier, and Graves, 2005). Overall, the philosophy or style of MI is often viewed as important, or more significant, than the technical application of this approach.

The NDARC review (Shand et al., 2003) summarizes the results from 13 experimental studies in which motivational interviewing was evaluated as (1) a prelude to more intensive interventions or (2) a stand-alone treatment in comparison with no treatment or (3) an alternative to skills-based counselling, standard treatment in a hospital emergency room, non-directive listening, directive confrontational counselling, other types of cognitive behavioural therapy and 12-step facilitation[11]. The reviews concluded that there was strong support for motivational interviewing as a treatment intervention but less support for its efficacy as a prelude to more intensive treatment.

Meta analysis studies of motivational analysis (Burke, Arkowitz, and Menchola, 2003) showed that its effects were equivalent to other active treatments and yielded moderate effects compared with no treatment and/or placebo for problems involving alcohol, drugs, and diet and exercise but not for smoking or HIV-risk behaviours. On average, and over 18 weeks of follow up, 51 percent of those who received Motivation Interviewing improved compared with 37 percent of those receiving no treatment without motivational interviewing. The average reduction in drinks per week among those receiving Motivation Interviewing was between 36 to 16 drinks. A recent large-scale experimental study involving young male cannabis users also showed that motivational interviewing could be effective with this population (Dennis et al., 2004).

Motivational interviewing is typically an aspect of so-called brief interventions (see page 21) and thus there is some overlap between studies of motivational interviewing and brief interventions.

Psychosocial Approaches to Relapse Prevention

All of the interventions considered thus far aim to prevent relapse and to equip those treated with skills for avoiding or coping with high-risk situations. However, the term relapse prevention is used to refer to a structured intervention that focuses on coping with high-risk situations. It is either offered in conjunction with other types of treatment, at the end of treatment or during

[11] Twelve-Step Facilitation (TSF) was developed for Project Match (see Project Match description). It consists of a brief, structured, manual-driven approach to facilitating early recovery from alcohol abuse/alcoholism and other drug abuse/addiction. It is based on behavioural, spiritual, and cognitive principles that form the core of 12-step fellowships such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA).

aftercare. There are two main models of psychosocial relapse prevention: (1) based on the work of Alan Marlatt (Marlatt and Gordon, 1985) and (2) developed by Terry Gorski (Gorski, 1989). The two models have some similarities and are often confused. Marlatt's relapse prevention model is based on scientific research and has a well-formulated and testable set of hypotheses about factors that determine the likelihood of relapse. In contrast, Gorski based his ideas on personal observations as a chemical dependency counselor over a period of several years.

Graves and Rotgers (1999) note other differences between these models:

> In essence, Gorski's approach is a restatement of the traditional 12-step approach to treatment aided by structured written exercises. Gorski's relapse model fails to deliver highly individualized treatment strategies that incorporate the individual's unique circumstances, learning history, and environment; something for which Marlatt's prevention model is equipped. Marlatt's prevention model places particular emphasis on ways to minimize the damage associated with relapse. The goal is to learn from relapse so as to avoid relapse in the future and cognitively process relapses in order to avoid diminishing one's motivation to succeed. Gorski's model deals minimally with relapse, beyond acknowledging, "each of us will get stuck in our recovery process periodically." Marlatt's approach supports treatment aimed at individuals gaining skills to overcome their problem, thereby increasing the individual's sense of self-efficacy. In contrast, Gorski is consistent with the 12-step model and requires an admission that the individual has become "powerless" over alcohol.

No scientific studies of relapse prevention using the Gorski model could be located. However many evaluations of alcohol-related interventions based on the Marlatt model have been published and many show positive results. As with studies of other treatments, studies of relapse prevention are not always comparable. The following common methodological issues in relapse prevention research were noted in the NDARC review:

- A great deal of variability across studies in terms of what relapse prevention actually consists of.
- The sample size in some of the studies was small resulting in limited statistical power to detect differences between conditions.
- The primary outcome measure differed across studies, making comparability difficult.
- The duration and intensity of treatment varied widely and thus the optimal amount of relapse prevention and the extent to which amount may be associated with robustness or durability of effects has not been empirically evaluated.

Despite these limitations, the accumulated evidence shows that relapse prevention can be effective as a stand-alone treatment or as a component of intensive treatment for a variety of clients with alcohol problems. Marlatt's model is clearly relevant to people who use drugs other than alcohol (Caroll, Rounsaville and Keller, 1991) and a few studies have shown benefits for this population. The results are somewhat mixed but suggest that relapse prevention may help people who use drugs after treatment (i.e., experience fewer problems) (McKay et al., 1997) compared with standard group counselling with individualized relapse prevention following intensive outpatient treatment for cocaine dependence. Rates of complete abstinence during a six-month study period were higher for those given standard group counselling. However,

relapse prevention fared better than group counseling in terms of a lower level of use among cocaine users during the first three months following treatment.

Wells et al. (1994) compared relapse prevention with a 12-step support group for the treatment of cocaine abuse. Their results indicated that outcomes were generally similar at six months although subjects receiving 12-step treatment showed greater increases in alcohol use from post-treatment to six-month follow up than those who received relapse prevention.

Stephens, Roffman and Simpson (1994) randomly assigned men and women seeking treatment for marijuana use to either a cognitive-behavioural relapse prevention intervention or to a discussion group. Data collected for 12 months post-treatment revealed substantial reductions in frequency of marijuana use and associated problems but no significant differences between those in the relapse prevention and the discussion conditions. However, men in the relapse prevention condition were more likely than men in the discussion groups to report reduced use without problems at three months post-treatment.

Structured Self-guided/Self-help Materials

Here the concern is with studies of the effects of books, correspondence courses, computer programs and Internet sites for people who are concerned about their drinking. No studies concerning such material for people with drug problems were identified. Common elements include didactic information regarding alcohol and alcohol abuse, goal setting and decision-making exercises, and strategies for changing and maintaining altered drinking patterns. In general, these options are geared to drinkers who are experiencing alcohol-related personal and social problems but who are not physically dependent on alcohol. One Internet site run by a group call Moderation Management appears to be especially attractive to women (Humphries and Klaw, 2001).

No studies on the effectiveness of Internet sites for problem drinkers have been published. One published study showed that patients who used a computer-based version of a behavioural self-control program immediately after treatment drank less, after one year, when compared with those who used the computer program 10 weeks later (Hester and Delaney, 1997).

No studies of store-bought self-help books have been published and the people who buy these books would, of course, be very difficult to access and to engage in a controlled research project. The NDARC review did, however, identify three experimental studies of structured materials distributed to problem drinkers by researchers. The comparison groups received only information or non-specific suggestions. In each case, the results indicated that those who received structured self-help material reduced their alcohol consumption more than others.

A more recent meta analysis of 22 studies of "bibliotherapy" defined as the provision of self-help materials to motivate and guide the process of changing drinking behaviour (Apodaca and Miller, 2003) indicated that bibliotherapy was a cost-effective intervention for problem drinkers seeking help to reduce their consumption and, to a lesser extent, for drinkers identified through screening as being at risk.

Self-help materials that people can use on their own or during follow up with a health care provider are readily available (Sanchez-Craig, 1995; Rotgers et al., 2002).

Community Reinforcement

A community reinforcement approach (CRA) uses a variety of means to help clients restructure their environments to move away from situations and events that reward drinking and to increase access to rewards for abstinence. One feature of this approach is contingency contracting. This involves agreements between a therapist and a client/patient and, perhaps also a family member, as to the consequences of compliance or non-compliance with agreed on behaviours, such a taking prescribed medication. Other features of this approach include using a functional analysis to determine antecedents and consequences of drinking; setting goals for sobriety; offering the option of using Disulfiram; and developing a treatment plan that involves communication, problem solving and drink refusal skills. In some studies, clients could also attend a job finding club, receive social and recreational counselling, marital therapy and relapse prevention training. Combining the strengths of a number of therapies may explain the effectiveness of this approach.

There is good, experimental evidence that community reinforcement is associated with positive outcomes in populations seeking treatment for alcohol problems (Holder at al, 1991; Finney and Monahan, 1991; Shand, 2003; Roosen et al., 2004).

The review by Roosen et al. (2004), which also considered the use of community reinforcement for the treatment of people with drug problems, shows mixed results. The study concluded that there was good evidence that the use of community reinforcement reduces the number of post-treatment drinking days but conflicting evidence with regard to continuous abstinence. Roosen et al. also concluded that there was moderate evidence that CRA with Disulfiram is more effective in terms of number of drinking days, and limited evidence that there is no difference in effect in terms of continuous abstinence.

The NIDA review (2005) describes an intensive 24-week community reinforcement approach for opiate users who also use cocaine. It also cites experimental and other types of studies showing that this intervention can be effective in outpatient detoxification of opiate-addicted adults and with inner-city methadone maintenance patients who have high rates of intravenous cocaine abuse.

> Patients attend one or two individual counseling sessions per week, where they focus on improving family relations, learning a variety of skills to minimize drug use, receiving vocational counseling, and developing new recreational activities and social networks. Those who also abuse alcohol receive clinic-monitored Disulfiram (Antabuse) therapy. Patients submit urine samples two or three times each week and receive vouchers for cocaine-negative samples. The value of the vouchers increases with consecutive clean samples. Patients may exchange vouchers for retail goods that are consistent with a cocaine-free lifestyle.

Dennis et al. (2004) found that an adolescent form of community reinforcement was of benefit to young male cannabis users.

Skills Training

Skills training aims to give people with substance abuse problems new strategies for coping with interpersonal stress without using drugs or alcohol to excess. Social skills training packages are often "broad spectrum" and include communication skills, listening techniques, problem solving and assertiveness training and sometimes drink or drug refusal skills training, relaxation training, stress management skills training and self-control training. Programs that offer pharmacotherapy also usually have skills training components.

Reviews of controlled studies of various types of skills training published in the 1990s indicated strong support for these types of interventions for people with alcohol problems (Holder et al., 1991; Mattick and Jarvis, 1993; Monti et al., 1994; Miller at al. 1995; Finney and Monahan, 1996; Walters, 2000). The Health Canada review (Health Canada, 1999) also endorsed skills training as an effective component of treatment. However, it is not clear which components of skills training are most effective. One review (Longabaugh and Morgenstern, 1999) attempted to throw light on this issue and also to identify the conditions under which skills training might be most effective. This review was limited to studies that randomly assigned clients to skills training or other interventions. The review suggested that skills training was not necessarily effective as a stand-alone treatment but that it was valuable in the context of other treatment modalities.

There has been less research on the use of skills training with people who have problems with drugs. The only relevant large-scale study showed that a 10-week skills training course provided to young male clients who had completed a residential treatment program was associated with reduced post-treatment use of marijuana and amphetamines but not other drugs (Hawkins et l., 1989).

Behavioural Counselling

A number of large-scale comparison group studies indicate that various kinds of outpatient, drug free psychological counselling, and especially those based on behavioural principles, can be helpful to people with opiate, cocaine, amphetamine, and cannabis problems. This also applies to adolescents with various types of drug problems (United Nations International Drug Control Programme, 2002; NIDA, 2005; Health Canada, 2000; Vaughn and Howard, 2004; Dennis et al., 2004).

Couples and Family Therapy

Couples and family therapy based on the disease or family system models have not been systematically evaluated and there is only anecdotal evidence for their effectiveness (Shand, 2003). However, there have been many studies of couples and family therapy based on behavioural principles. These seek to improve communication and problem solving skills and to increase the exchange of positive reinforcement between partners and other family members.

The quality of research on Couples and Family therapy based on behavioural principles is highly variable. Reviews by Holder et al., (1991), Finney and Monahan, (1996) and Mattick and Jarvis (1993) indicate that behavioural family therapy is more effective than no treatment. The NDARC reviewers concluded that behavioural couple's therapy was no more effective than individual treatment for people with alcohol problems. However, a meta-analysis by Stanton and Shadish

(1997) indicated the superiority of family therapy over individual counseling or therapy, peer group therapy, and family psycho education. Family therapy was also shown to be as effective for adults as for adolescents and appears and a cost-effective adjunct to methadone maintenance.

One large-scale study involving young male marijuana users (Dennis et al., 2002) showed that family therapy produced similar results as motivational enhancement treatment, community reinforcement approaches or cognitive behaviour therapy. However, after controlling for initial severity, the other, non-family, treatments were found to be more cost effective.

Self-help Groups as a Relapse Prevention Resource

Alcoholics Anonymous is readily available resource for people who wish to stop drinking and remain sober. Similar groups for people who use narcotics (NA) or cocaine (CA) exist in some communities, as do other self-help groups for people with alcohol problems (e.g. Secular Organization for Sobriety and Women for Sobriety). Involvement with AA and NA has been shown to be associated with positive long-term outcomes for those who have become sober and drug free through formal treatment or by other means but the evidence is correlational. It is likely that those who chose to go to these types of self-help groups may be more motivated than those who do not. Also studies of AA suggest that many of those who attend do not continue to do so on a regular or long-term basis.

Although not as widely available as the 12-step programs (i.e., AA, NA, CA), there are several self-help groups in Canada and the United States that are modeled according to research principles, often cognitive behavioural in orientation. These groups include Self Management and Recovery Training (SMART Recovery), Rational Recovery, and Moderation Management. SMART Recovery is manual driven with clearly defined goals and objective and is facilitated by a trained moderator. SMART Recovery is based on the work of the well-known cognitive psychologist, Albert Ellis.

The Matrix Model

This abstinence-based program is described in the NIDA review (2005) and has proved helpful to people who use cocaine or other stimulants.

> Patients learn about issues critical to addiction and relapse, receive direction and support from a trained therapist, become familiar with self-help programs, and are monitored for drug use by urine testing. The program includes education for family members affected by the addiction. The therapist functions simultaneously as teacher and coach, fostering a positive, encouraging relationship with the patient and using that relationship to reinforce positive behaviour change. The interaction between the therapist and the patient is realistic and direct but not confrontational or parental. Therapists are trained to conduct treatment sessions in a way that promotes the patient's self-esteem, dignity, and self-worth. A positive relationship between patient and therapist is a critical element for patient retention. Treatment materials draw heavily on other tested treatment approaches. Thus, this approach includes elements pertaining to the areas of relapse prevention, family and group therapies, drug education, and self-help participation. Detailed treatment manuals contain work sheets for individual sessions; other components include family educational groups, early recovery skills groups, relapse prevention groups,

conjoint sessions, urine tests, 12-step programs, relapse analysis, and social support groups.

The NIDA review cites projects that suggest the efficacy of this approach for methamphetamine users and cocaine users. However, no studies with appropriate control groups appear to have been published.

Cue Exposure

Cue exposure is based on the idea that people, places, and objects associated with drinking become cues for people with alcohol or drugs problems, and are often responsible for relapse. Cue exposure treatments expose patients to alcohol or drug-related cues, allowing them to practice alternate responses that can be used in real-life situations. Cue exposure is often taught in conjunction with coping skills for dealing with urges to drink or take drugs.

Early studies of cue exposure produced mixed results (Health Canada, 1999). One more recent study Rohsenhow et al. (2001) showed that cue exposure could improve outcomes when it is a component of more intensive treatment for alcohol problems. One other study (Sitharthan et al., (1997) showed cue exposure to be superior to goal setting, self monitoring and the use of behaviour and cognitive strategies to moderate drinking. Two other studies (Health et al., 2002; Dawe et al., 2002;) showed that drinking outcomes for patients treated with cue exposure were similar to those treated with other cognitive-behavioural interventions.

Only one controlled trial of cue exposure for users of other drugs was found. This involved opiate users and the results showed that patients given six sessions of cue exposure at the end of either 10-week or a four-week treatment program did not differ from others in their reactions to opiate cues when tested after six months (Dawe et al., 1993).

Covert Sensitization

During covert sensitization treatment clients are asked to imagine themselves drinking and to then imagine negative consequences such nausea. Sometimes they are also exposed to an unpleasant odour once they indicate that their favourite drink is clearly in mind.
There have been no recent studies of covert sensitization for alcohol dependence and early reviews were inconsistent (Holder et al., 1991; Finney and Monohan, 1991). No studies involving people who use other drugs have been published.

Acupuncture

Acupuncture is not widely used in Canada or in the United States but in some Eastern European countries and in the Middle and Far East it is often used in alcohol and drug detoxification and treatment programs. There is evidence that acupuncture is useful in detoxification programs (Toteva and Milanov, 1996; Karst, 2002) and one recent review concluded that acupuncture could be valuable in the treatment of alcohol dependence (Mayer, 2000). However, a recent large-scale control study conducted in the United States (Bullock et al., 2002) showed that acupuncture did not make a significant contribution to the reduction of alcohol use when compared with conventional treatment.

Psychotherapeutic Approaches

The concern here is with psychotherapeutic approaches that involve confrontation and with insight-oriented group or individual psychotherapies. These all aim to give clients insight into their behaviours and sometimes to help them resolve conflicts originating in childhood experiences. These psychotherapies are often complex and over the course of therapy unpredictable; this makes them difficult to evaluate using experimental methods. The Health Canada review (1999) indicated there was little empirical support for these types of therapies and the NDARC review indicates that this continues to be the case.

Treatments Based only on Alcoholics Anonymous (AA) Steps and Traditions

Many treatment programs, and especially residential programs, use AA steps and traditions and require clients to participate in AA meetings. The evidence that this contributes to program effectiveness is mixed for these approaches. Two comparison group studies indicated strong support for AA-based programs compared with withdrawal management alone. However, two randomized trials showed no significant differences between the outcomes of those treated in AA-based or non-AA residential programs (Kownacki and Shadish, 1999).

AA groups in the community are a resource for those who wish to stop drinking and do not offer a fixed treatment that can or needs to be evaluated scientifically. This is also the case for most other self-help initiatives (e.g., Women for Sobriety, Moderation Management, Rational Recovery, SMART Recovery) and similar groups for people with drug problems.

Other Treatments

A variety of other psychosocial treatments have been used: education, hypnosis, chemical aversion therapy, electrical aversion therapy, and videotape confrontation. None of these have proven to be especially effective (Health Canada, 1999).

Factors Influencing Treatment Outcomes

Factors other than treatment itself may influence what happened to those treated. These include characteristics of those treated; treatment setting; patient/treatment matching; therapist effects; treatment format, duration and aftercare of treatment; and non specific factors. Issues concerning treatment delivery systems are, however, beyond the present scope but the importance of these issues (e.g. availability and accessibility of appropriate services) needs to be recognized especially with respect to youth (McLellan and Meyers, 2004).

Treatment Format, Duration and Aftercare

Many programs offer treatment in groups rather than to individual clients. Several studies have shown that this is cost effective (e.g. Schmitz et al., 1997; Graham et al., 1996; Sobell et al., 1995). Also, as indicated in Health Canada's 1999 report, groups have the benefit of allowing members to identify with others with similar problems and provide opportunities for participants to learn from each other and to practice new skills.

Uncontrolled studies have shown that longer stays in treatment are associated with greater reduction in post-treatment drinking and drug use and with improvements in other life areas. However, when treatment duration has been controlled experimentally, shorter treatments have been as effective as more extended ones (Shand, 2003; United Nations International Drug

Control Programme, 2002)[12]. This is that case for both outpatient and residential programs. Optimum periods of treatment have not been clearly established.

In practice, most residential programs run from three to four weeks, except for brief interventions (see below), while structured outpatient programs usually involve 6 to 15 sessions over a period of 30 to120 days. People with more serious alcohol or drug problems may need treatment over an extended period and benefit from an initial intense treatment experience (Crits-Christoph and Siqueland, 1996). Treatment drop out is a concern in long-term programs and those who drop out tend to have more problems than others.

A number of intentionally brief interventions have been developed and evaluated either for people seeking help for drinking problems or for others found to be at-risk drinkers when screened in various settings (e.g. social service agencies, hospital emergency departments) or by general practitioners. For non-treatment seeking populations, brief intervention may take from 30 seconds to 30 minutes. For treatment seeking populations, brief interventions have been defined in many different ways but generally they involve no more than four, one-hour sessions. The content and format of the brief interventions described in the evaluation literature are quite variable but in general these interventions use motivational interviewing (discussed earlier) and other behavioural methods that aim to increase self-efficacy and responsibility by providing information and advice on self-help strategies.

Many controlled studies of brief interventions for people with alcohol problems have been published as have several reviews and meta-analyses (e.g. Bien and Miller and Tonigan, 1993; Poikolainen, 1999; Shand, 2003; Moyer et al., 2002; Ballesteros et al., 2004). The accumulated evidence supports their effectiveness, particularly for those identified in non-specialized settings and who have less serious alcohol problems and no significant social or mental health problems. The meta-analysis reported by Moyer et al. (2002) indicated that in non-treatment seeking populations the effects of brief interventions were small to moderate. This means that on a given outcome the percentage differences between those above the median in the brief intervention or control conditions are in the order of 10 to 26 percent.

Brief interventions can also benefit some people who seek treatment for alcohol problems and could thus be considered as an initial treatment. Those who do not respond to brief treatment could then be referred to a more intensive treatment in a “stepped care” approach (Breslin et al., 1998).

Brief interventions may also be of benefit to people who use drugs other than alcohol and especially those who do not have significant drug-related or other problems. This is supported by some studies noted in the section on prevention and under the heading motivational interviewing. There is, however, some limited, empirical support for brief interventions for adolescent drug users seeking treatment (Tait and Hulse, 2003).

Despite the evidence favouring brief interventions, it also appears that treatment outcomes can be improved if those who complete a time-limited course of treatment are also involved in some

[12] Except in the case of methadone maintenance, which may be necessary for months or years.

kind of aftercare such as weekly or monthly group meetings. Many programs view Alcoholics Anonymous, Narcotics Anonymous and Cocaine Anonymous groups in the community as aftercare resources and clients are encouraged to join.

Most of the evidence for the effects of aftercare, including participation in AA or other self-help groups, comes from non-experimental studies that have not controlled for client motivation or other factors that could influence outcomes. Several studies have also failed to show benefits of aftercare (Health Canada, 1999), as has one experiential study (Connors, Tarbox and Faillace, 1992). Three experimental studies have showed positive results. In one study (Ossip-Klein and Rychtarik, 1993), 50 male alcohol abusers who had recently completed a four-week inpatient alcoholism treatment program were randomly assigned either to receive a calendar prompt and behavioural contract with a family member to reinforce aftercare participation or to participate in a standard aftercare arrangement. During the six months preceding discharge, the results showed significant aftercare attendance differences. Approximately twice as many contract clients attending aftercare sessions as standard aftercare clients. During a one-year follow up, subjects in the contract condition had significantly more months of abstinence and were more likely to be classified as a treatment success. Two other experimental studies have also shown that post-treatment relapse prevention sessions improve treatment outcomes, at least in the short term. One of these studies involved clients who had completed a five-month behavioural marital therapy program and who received 15 relapse prevention sessions over 12 months or no additional treatment (O'Farrell et al., 1993). The other study involved severely dependent drinkers who received eight one-hour sessions of relapse prevention over two weeks or participated in discussion groups (Allsop et al., 1997).

Experts agree that aftercare is very important for adolescents (Health Canada, 2002c) but the evidential basis for the effectiveness of aftercare for this population is limited. Compton and Pringle (2004) argue for adaptive, progressive interventions, in which those who do not respond to the first intervention package are referred for further treatment. This is akin to the stepped care approach that has general relevance in substance abuse treatment (Breslin et al., 1998).

Patient/Treatment Matching

Many people with alcohol or drug problems have social and mental problems that may need to be addressed to improve their chances of long-term recovery and there is very good evidence for the increased effectiveness of programs that provide appropriate services for people with these problems (McLellan et al., 1997; 1998).

There is also a consensus among treatment experts that no single therapy produces the best outcomes for all patients with alcohol or drug problems and that specific types of treatment may be especially effective for certain types of patients. This has stimulated research on the benefits of patient-treatment matching but only for people with alcohol problems. The NDARC review identified more than 30 such studies. Although many of these studies reported positive effects of matching, the majority suffered either from methodological flaws or limited power and have not been replicated.

The largest study of matching involving people with alcohol problems was called Project Match. The treatment types selected for study were: 12-step facilitation where clients were encouraged

to join AA; cognitive behavioural therapy, based on social learning theory; and motivational enhancement therapy, based on motivational psychology. Patients were randomly assigned to treatment and a variety of hypotheses were tested concerning interactions between treatment types and severity of alcohol involvement, cognitive impairment, psychiatric severity, conceptual level, gender, meaning-seeking, motivational readiness to change, social support for drinking versus abstinence, sociopathy and type of alcoholism.

The results provided little support for specific hypothesis about patient-treatment matching. Psychiatric severity was the only attribute that showed significant matching effects, and as predicted, patients low in psychiatric severity had more abstinent days after 12-step facilitation than after cognitive behaviour therapy. The outcome results also showed clients high in anger and resistance performed best with motivational enhancement treatment. There were no differences for patients with high levels of psychiatric severity or any of the other attributes considered. Further analyses of the Project Match results have suggested other matches but none are especially striking (NDARC review, 2003).

Therapists Effects

It seems reasonable to assume that some therapists may be more skillful than others and thus have higher rates of success and some research supports this assumption. One review (United Nations International Drug Control Programme, 2002) cites studies showing that "programme counsellors who possess strong interpersonal skills, are organized in their work, see their clients more frequently, refer clients to ancillary services as needed and generally establish a practical and 'therapeutic alliance' with the patient achieve better outcomes." McLellan et al. (1988) found that patients on methadone assigned to different counsellors later differed with respect to reductions in illicit drug use, unemployment and arrests and methadone dose levels. Some non-experimental studies have also shown greater effectiveness of counsellors high on "empathy" as well as those in recovery themselves (Najavits and Weiss, 1994; Kownacki and Shadish, 1999).

Results from a large-scale US study designed to show benefits of matching patients to treatment (Project Match, 1997) suggest that therapist characteristics may be associated with client outcome in complex ways but the results must be interpreted with caution because clients were not randomly assigned to therapists.

Treatment Settings

Specialized treatments for alcohol or drug problems are provided on an outpatient basis or in residential settings. Most outpatient programs involve day or evening sessions of one to two hours but a few also offer half-day or full-day programs.

Evidence concerning the relative effectiveness of residential versus outpatient treatment for people with alcohol problems is mixed (Shand, 2003) and for people with drug problems, treatment outcomes for those treated in residential programs tend to be similar to those treated on an outpatient basis (Alterman et al., 1994; Hubbard and Rachal, 1984). Thus, given the higher costs associated with residential programs, there are concerns that these are not cost-effective for those who would otherwise do well when treated on an outpatient basis. This may not be the case for regional residential treatment centres that serve people from small, geographically dispersed communities where the cost of providing local outpatient services may be high.

Residential treatments run by Aboriginal people have not been scientifically evaluated nor have intensive residential treatment centres that emphasize AA principles and the "disease concept" of alcoholism (e.g. the Halzeden and Minnesota model programs). Much of the apparent successes of these latter types of programs may be due to their selection process and the provision of a continuum of services. Research involving residential therapeutic communities suggests that longer stays are associated with better outcomes (Landry, 1995). At the same time, there is no convincing evidence that, on average, treatment in a therapeutic community is more effective than other forms of treatment.

Some clinicians believe that residential treatment is appropriate for people who have repeatedly failed to benefit from outpatient treatment and especially for those who are severely dependent on alcohol, those who lack social support and those with serious mental health problems. The evidence is limited, however, and other factors such as the quality and duration of treatment and the skills of therapists seem to have a greater influence on outcomes than does treatment setting (Finney et al., 1996).

Of course people who are socially unstable or in crisis may need a safe place to stay and family members may feel relieved knowing that their loved ones are in a residential program and not on the streets. However, the "crisis management" and "social stabilizing goals" of residential programs should not be confused with longer term "curative" goals that could be achieved by other, more cost-effective means.

Client Factors

Studies from a various countries have shown that, in general, those who drop out of treatment and those who relapse more rapidly after treatment tend to have more serious alcohol or drug problems, more serious mental health problems and fewer social supports for abstinence or non-problematic substance use (United Nations International Drug Control Programme (2002). Some of these studies have also shown that treatment outcome is influenced by client motivation, physical health status, employment status, vocational preparedness, previous criminality. However, as noted in the section on patient-treatment matching, "harder to serve" cases do benefit from programs that recognize their multiple needs and provide appropriate services (McLellan, et al., 1998).

It is also generally acknowledged that young, chronic inhalant abusers are difficult to treat and that generic substance abuse treatment programs are not equipped to deal with the multiplicity, intensity and complexity of problems that the inhalant abuser presents (National Inhalant Prevention Coalition website http://www.inhalants.org/). Although techniques used in typical alcohol and drug treatment can be applied to solvent abusers, a host of other specific issues must also be addressed. Chronic users experience a range of mental health problems, from mild impairment to severe dementia. They also tend to have social and emotional problems, including violent behaviours and depression. Physical and sexual abuse (often involving family members) is also common among solvent abusers as are other forms of substance abuse. Some specialized programs for inhalant abuse have been developed. Canada has eight residential programs especially for the treatment of inhalant abuse among First Nations youth ages 12-26. The National Youth Solvent Abuse Program operates these facilities and is based on a network of

eight Youth Residential Treatment Centres spread across Canada.[13] There is very little research on the effectiveness of these or other specialized inhalant abuse programs. However, some useful guidelines for treatment professionals have been developed (http://www.inhalants.org/Inhalants_March2003.pdf.)

Non-specific Factors

All treatment interventions may have non-specific positive, placebo effects. Treatments are delivered in the context of programs and services whose components include "ritualized" admission, assessment and discharge process that in themselves create or reinforce motivation and symbolize a process of change. This could account for the results of some large-scale studies showing approximately equal benefits for diverse interventions (Sells and Simpson, 1974-1976; Simpson and Savage, 1980; Hubbard and Rachal, 1984).

[13] Funding for the National Youth Solvent Abuse Program is provided through the First Nations and Inuit Health Branch (FINIHB) of Health Canada.

3. Evidence-based Practices in Harm Reduction for Injection Drug Users

Harm reduction initiatives that promote responsible alcohol use have been in place for many years However, harm reduction is most often used to refer to a number of specific initiatives that focus on the harms associated with injection drug use (e.g., syringe exchanges, supervised injection rooms, outreach education on reducing the risk of self injection and other behaviours, methadone maintenance and the prescription of heroin or other opiates). These initiatives are rooted in measures taken in the 1980s to reduce the spread of HIV among injection drug users. Some policy advocates regard the criminalization of drug users as a harm that would be reduced if laws and sentencing procedures were to be changed. This, and other policy changes, are considered in the section on prevention. The prescription of methadone, heroin and other substitute drugs are considered in the section on treatment. This section focuses on: syringe or needle exchange programs, supervised injection sites and outreach harm reduction education.

Syringe Exchanges

Syringe exchange programs differ considerably with respect to their policies and services. Some limit the number of syringes that individuals can receive at any given time or only give out new syringes in exchange for used ones. Others have more liberal syringe distribution policies and allow users to take a large number of syringes on the understanding that they will distribute them to other injection drug users (IDUs). Programs also differ with respect to the provision of counselling, outreach and other services. These services also operate in many different environments that vary with respect to the accessibility of treatment and support services. Unfortunately these differences have not been systematically evaluated or adequately reflected in any of the reviews considered here.

The prestigious journal *AIDS* (Gibson, Flynn and Perales; 2001) published a review of 42 studies of syringe exchange programs (SEPs) found in the scientific literature from 1989-1999. Almost all of these studies were conducted in the United States, Canada, and the United Kingdom or in the Netherlands. The outcomes of interest were HIV-risk related behaviours and/or HIV seroconversions

These studies used samples that included users of SEPs (23 studies) or both users and non-users (13 studies). Six were ecological studies that examined differences between populations in communities with or without SEPs. The studies mainly had longitudinal/prospective, case control or comparison group designs. However, five related studies by the same researchers used mathematical models to assess the effectiveness of SEPs on HIV infection rates. The researchers used data on HIV infections in returned syringes and the time these syringes were in circulation.

The reviewers draw attention to some of the methodological limitations of each study and also to some general limitations. One general concern was the failure to control for the possibility that users and non-users of SEP might differ in ways that affect their risk of HIV infections (e.g., syringe sharing patterns, frequency of injection, lifestyles and access to other sources of syringes such a pharmacies). Most studies also relied on self-reported HIV risk behaviours and only five used biological markers. Finally, the measures of the actual use of syringe exchange services

were typically crude (e.g. the individual used once or more in a six-month period). It is also of note that this review did not consider differences in the policies of the programs studied and differences in their operating environments.

Despite these limitations, the reviewers concluded that the studies provide "substantial evidence that syringe exchange programs are effective in preventing HIV risk behaviour and seroconversions among injection drug users (IDU)". The relationships between SEPs and risk behaviours or seroconversions were typically positive in studies of SEP users, ecological studies and modeling studies. However, in 13 (52 percent) of the 25 studies that compared SEP users with others, there were no differences. In 2 (8 percent) of the 25 studies, the differences favoured non-SEP users. Also, SEP users and non-users were not clearly equivalent in all cases.

A more recent review conducted by the Australian National Council on AIDS, Hepatitis C and Related Diseases (Puplick, 2000) encompassed some of studies considered in the review by Gibson, Flynn and Perales D, 2001. This Australian study drew attention to differences in HIV infection rates between Australia (which has many well-established SEPs) and the United States (which has very few SEPs). The researchers concluded that, "There is abundant evidence from Australia and other countries of the public health benefits of Needle and Syringe Programs." A recent review by the World Health Organization reached similar conclusions (World Health Organization, 2004) as did a recent review published on-line by the US Drug Policy Alliance (http://www.drugpolicy.org/reducingharm/http). Both of these reviews also noted studies that indicate that SEPs can be cost effective and that they do not increase drug use, negatively impact drug treatment or increase rates of equipment in the street.

Staff at the Canadian Centre on Substance Abuse recently reviewed reports on needle and syringe exchange programs in prisons in Switzerland, Germany and Moldova and Estonia. The conclusions are available on-line at http://www.ccsa.ca/pdf/ccsa-011058-2004.pdf, highlights of this review are included here:

- Prison-based needle exchange programs can be seen as an integral part of a comprehensive drug strategy, along with other harm reduction, treatment, and maintenance options to reduce prisoner engagement in high-risk behaviours.
- To date, there are no documented cases in which needles have been used as weapons against either correctional staff or prisoners.
- A recent review found no increase in drug use or injection drug use in prisons offering needle exchange programs.

Staff and associates of the Canadian HIV/AID legal network (Lines et al., 2004; available at: http://www.aidslaw.ca/Maincontent/issues/prisons/pnep/PNEP-report.pdf) reached similar conclusions from a review of the literature and site visits. This report recommended that federal and provincial/territorial correctional services in Canada should immediately take steps to implement multi-site pilot needle exchange programs.

Syringe exchanges can also have other beneficial effects such as reducing the number of needles discarded in pubic places and linking users with health care and treatment services (World Health Organization, 2004). However, the evidence for such benefits is mainly anecdotal and

there are significant policy, practice and contextual differences between syringe exchange programs that need to be considered.

Supervised Injection Sites

Sites where injection drug users can use street drugs without fear of prosecution and in the presence of health care providers have been established in the Netherlands, Switzerland, Germany, Australia, and more recently in Vancouver. They have had both public health and public order objectives connected to these facilities (e.g., prevention of fatal overdose, linking users with adjunct services such as needle exchange programs and reducing public self-injection). Some supervised injection sites also have counselling services, showers and day or night rest areas. There is no consensus as to whether or not supervised injection sites contravene international drug control treaties but they are widely regarded as valuable from a public health perspective in all countries where they have been established.

Peer-reviewed journals have not published any evaluations of supervised injection sites and the evidence for the effectiveness of these sites is generally descriptive or anecdotal. The one exception is a recent evaluation report on a site in Vancouver (Wood et al., 2004). This lack of evaluation is especially so for sites in Europe (Canadian HIV/AIDS Legal Network, updated; Dolan 1999). In some cases, there is statistical data on changes in overdose rates, public drug use, neighborhood complaints about drug use and drug-related criminality. As such, the weight of evidence is in favour of supervised injection rooms from both public health and public order perspective.

More is known about the supervised injection sites in Sydney, Australia, (Mattick et al., 2003). This project was monitored during it first 18 months of operation and showed several positive benefits including improved injecting practices; decreased public self-injection among the facility users; the successful management of some potentially fatal overdoses; and increased referrals to treatment.

There were no detectable increases in overdoses in the community, no increases in blood born virus transmissions, and no increases in crime. The injection room was also accepted by the majority of the local residents and by the local business community.

The supervised injection site in Vancouver is currently being evaluated by the BC Centre for Excellence in HIV/AIDS. This will be the most rigorous of all evaluations to date and involves extensive monitoring of client characteristics and service activities, a series of in-depth interviews and blood tests of a random sample of service users. This includes studies of two large cohorts of injection drug users in the community who will serve as comparison groups. The study also involves a series of observational and qualitative studies that will measure activities among drug users and the impact of the site on the community.

Preliminary results from the Vancouver evaluation are encouraging (BC Centre for Excellence in HIV/AIDS, 2004). Attendance has been high and an average of 600 injections per day take place at the site. There have been no fatalities and over 100 overdoses have been observed and managed appropriately. A large number of referrals have been made to withdrawal management

and counselling services. The opening of the facility was independently associated with reduced injection-related litter, reduced public injection drug use, and reduced public syringe disposal (Wood et al., 2004). The CBC reported Vancouver Police as saying that the supervised injection site has not been an issue for them (http://vancouver.cbc.ca/regional/servlet/View?filename=bc_vpd_sis20040303).

Outreach Harm Reduction Education

Outreach includes initiatives where professionals or volunteers aim to contact injection drug users in community settings and to provide them with information about ways to reduce the risks associated with injection drug use and to increase motivation for behaviour change (Hunt, Trace and Bewley-Taylor, 2004). Examples of outreach measures include the use of sterilized injection equipment and encouraging users to seek help for health problems. Many outreach services also distribute bleach, condoms and clean needles.

One major review of out-reach education services was located (Coyle, Needle and Borman 1998). This study reviewed 36 reports of outreach-based HIV risk reduction projects that targeted out-of treatment injection drug users. It reported on the effects of the intervention based on HIV-related behaviours and/or seroincidence.

Most of the services were supported by the US National Institute on Drug Abuse (NIDA). The studies used proven methods to reach hidden populations, theory-based education methods and outreach workers who could relate well to the populations served. Study designs varied from project to project but most included pre and post measurement. A few studies featured the use of control groups including groups exposed to greater versus lesser intensity interventions. One study also used an experimental design to evaluate the effectiveness of alternative behavioural intervention strategies.

The authors' summary of their review is accurate and concise and is therefore reproduced verbatim:

> The majority of the published evaluations showed that IDUs in a variety of places and time periods changed their baseline drug-related and sex-related risk behaviours following their participation in a outreach-based HIV risk reduction intervention. More specifically, the publications indicated that IDUs regularly reported significant follow-up reductions in drug injection, multi-person reuse of syringes and needles, multi-person reuse of other injection equipment (cookers, cotton, rinse water), and crack use. The studies also showed significant intervention effects in promoting entry into drug treatment and increasing needle disinfection. Although drug users also significantly reduced sex-related risks and increased condom use, the majority still practiced unsafe sex. One quasi-experimental study found that reductions in injection risk led to significantly reduced HIV seroincidence among outreach participants. Few investigators looked at dosage effects, but two reports suggested that the longer the exposure to outreach-based interventions, the greater the reductions in drug injection frequency.

The authors concluded that outreach-based interventions with out-of-treatment injection drug users could positively influence risk behaviours and lead to lower HIV incidence among program participants.

A recent review by the World Health Organization also concluded that outreach was an effective strategy for reaching hidden populations of injection drug users and that "a significant proportion of IDUs receiving outreach based interventions reduce their risk behaviours concerning drug use, needle and sexual practices and increase their protective behaviours" (World Health Organization, 2004).

A number of other harm reduction initiatives that involve outreach to drug using populations also merit mention. These aim principally to reduce the risk of overdose and poisoning and include campaigns to encourage drug users to call emergency services, training and information on overdose prevention and management and the provision of Naloxone to drug users and others for use in emergencies. Laboratory testing services for illicit drug purity and potency have also been offered in some countries. Although the evidence for the effectiveness of these initiatives is very limited further experimentation and research appears to be justified (Hunt, Trace and Bewley-Taylor, 2004)

4. Evidence-based Practices in Prevention

This section summarizes the current scientific literature regarding "what works" in the area of substance use prevention. Prevention in this context refers to methods that seek to prevent substance use, delay the age of first use, reduce heavy use and misuse, or prevent/reduce associated harms in the general population.

Three categories of prevention interventions have been identified: universal, selective and indicated. Universal prevention interventions are aimed at the general public or a whole population (e.g., students) with messages of preventing or, at least, delaying use. These are blanket programs designed to target a large group of people, including those at high and low risk for use and misuse. Selective interventions are specifically targeted to high-risk groups — that is, subgroups that show known risk factors for substance use or abuse (e.g., children of drug users) but yet show no signs of involvement. Indicated prevention programs are designed to prevent abuse among those who already use substances and show early signs of misuse or show signs of other serious problems (e.g., depression), which increases their chances of developing a substance abuse problem. The goals of indicated programs are to curb the growth of substance abuse and other problem behaviours — an approach much akin to harm reduction.

The vast majority of prevention research is universal or selective with the goal of preventing or delaying use among children and adolescents. This section explores the key findings under the following headings: school-based approaches, school-based harm reduction programs, family-based approaches, mass media approaches, community-based approaches, regulatory approaches, the developmental risk and protective factors approach, preventing Fetal Alcohol Spectrum Disorder.

The majority of studies are school-based due to the relative ease of implementation, available study controls, and large captive audiences. Although much research has been conducted over the past three decades in evaluating prevention strategies, relatively few studies have used rigorous scientific methods to ensure proper evaluation.[14]

This section examines findings from four recent comprehensive reviews of alcohol and drug prevention by (1) Hawks and colleagues (2002) from the Word Health Organization; (2) Holder (2003) from the Pacific Institute for Research Evaluation, (3) Foxcroft and colleagues (2003) from the Cochrane Drugs and Alcohol Group; and (4) Loxley and colleagues (2004) from the Australian National Drug Research Institute and the Centre for Adolescent Health. These comprehensive reviews employed stringent study selection criteria on the design outcomes in order to select only the most exemplary studies for inclusion. To supplement this strategy, we conducted a literature search for prevention studies published between 2001 and 2005, as well as a review of unpublished studies of merit. Despite the search, no unpublished studies were

[14] Well-designed prevention studies measure behaviour change rather than only changes in knowledge, attitudes, and beliefs; have comparable intervention and control groups to which individuals are assigned randomly, or demonstrate group equivalence at baseline; use large, representative samples; have a sufficient follow-up period of at least 12 months; do not have excessive attrition rates (no more than 30 percent after 12 months) and a check for differential attrition between groups; control for extraneous factors that may threaten validity; ensure fidelity to the program; and report on all targeted outcomes (including negative results).

included in this review. Among the published primary studies identified, we reviewed only those that satisfied rigorous design and measurement criteria.

School-based Approaches

School-based interventions have received significant attention in the research literature over the past 30 years. Early drug interventions in schools were designed to change attitudes and provide knowledge but did not target behaviour change. These programs were replaced with affective programs that focused on values and decision-making skills. Currently, the social influence model dominates school-based interventions and includes strategies designed to strengthen resistance skills, encourage questioning of social norms, and improve media literacy. The premise of social influence interventions is to inoculate students against direct and indirect social pressures to use substances.

Most school-based programs are universal in that they are aimed at all students regardless of their risk for use, and come from the United States where the goal of programs is abstention from alcohol and drug use rather than harm reduction. Most school programs tend to target tobacco and alcohol, with less attention given to cannabis and even less to other illicit drugs.

The systematic reviews found that only a very small proportion of school-based evaluations met the standards of rigorous methodology and, among these, very few showed only small to moderate effects. The difference in use between those receiving and not receiving the intervention, while statistically significant, was small in magnitude. The evidence shows that, at best, school-based programs can delay substance use among non-users and/or reduce use among users for a short time, as any effects found tend to decay over time. It is important to note, however, that even a small effect in a large population can have a significant impact on prevalence, and furthermore, delayed use is a worthwhile outcome. Indeed, much research shows that early initiation of substance use is associated with elevated consumption, problem use, and related social problems in the future.

A special note must be made here about the Life Skills Training (LST) program because it is a popular school program in the United States due largely to the long-term studies showing its effectiveness in reducing tobacco, alcohol, and illicit drug use among students. This social influence program was developed by Gilbert Botvin over two decades ago. Its main component is enhancing skills such as assertiveness, problem solving, self-esteem, social efficacy, and communication. This program was considered exemplary until recently when several critics exposed flaws in the research methodology, statistical analyses, and interpretation of the findings, to the extent that there are now doubts about its claims, especially in reducing illicit drug use (Foxcroft et al., 2003; Gorman 2002; Gorman, 2003; Hawks et al., 2002). At best, a well-implemented LST program can produce a small effect in delaying the onset of tobacco and alcohol use, rather than preventing it altogether (Coggans, Cheyne, & McKellar, 2003).

It is very difficult to conclude what specific components of a school program are key, mainly because the individual elements (i.e., content, duration, instruction) are rarely scrutinized. Several reviewers (Cuijipers, 2002; Hawks et al., 2002; Loxley et al., 2004) conclude that the following components are key: using a social influence model that focuses on correcting normative beliefs that tend to overestimate peer and adult substance use; teaching media literacy;

providing honest, factual or "utility" information about effects of use, especially short-term risks; interactive delivery methods that enable discussion; using a credible instructor that can facilitate interaction; and adding community components (e.g., policies, media campaigns) to reinforce anything taught in schools, as contradictions in the community will negate any school messages.

Hawks and colleagues (2002) suggest that school programs should be delivered during three critical phases: an inoculation phase before exposure to substances, a *relevancy* phase during initial exposure, and a later relevancy phase when prevalence of use increases and contexts change. The timing of these phases should be guided by an examination of local prevalence data. Hawks and colleagues recommended that general substance use programs be used for children under 13 years of age, whereas older teens should receive programs with a single- substance focus — that associated with the highest prevalence or most harm in the community.

Any program delivered should contain information that is relevant to students, that is, it should be culturally appropriate, applicable to their life experiences, and be of immediate practical concern to them. Schinke and colleagues (2000) conducted a randomized trial to evaluate a culturally focused school intervention in Native American communities among students in grades 3 to 5. The program used a social influence model with an intense focus on Native American themes and values (e.g., incorporating Native American stories, concepts of holistic health and traditions that run counter to substance use). Follow up after three and a half years showed significant reductions in the weekly use of alcohol and marijuana among the intervention group compared with the control group. This study is promising in that it has demonstrated the value of a culturally tailored intervention over the longer-term, but further study of this program is required before a recommendation can be made.

The reviews conclude that what does not work in school-based programs is a focus on resistance skills, decision-making skills, assertiveness, social skills, self-esteem enhancement, values clarification, or discussing alternative activities to achieve the perceived benefits of substance use (e.g., sports). Attempts to generate fear and anxiety by dramatizing the risks associated with substance use are not effective, as youth tend to disbelieve the exaggerations and then eschew the entire program. In addition, the moral approach does not work. Lecturing students about the "evils" drinking, and drug use will likely distance youth, and may even backfire, especially if the information contradicts their own experiences. The use of peer leaders is also questionable as rigid social groups exist among students and, consequently, some students could be put off by the choice of leader.

Perhaps the most popular school-based prevention program in North America is the Drug Abuse Resistance Education (DARE) program, which is delivered by uniformed police officers. Content covers knowledge, attitudes, self-esteem and decision-making skills, and alternatives to drug use (e.g., exercise and stress management). Many studies have shown that DARE has no significant effects on alcohol or drug use, and experts do not recommend this program (Foxcroft et al., 2003; Hawks et al., 2002; Loxley et al., 2004).

Reviewers hypothesize that false assumptions may underlie much of the failed programs: use and abuse are not interchangeable terms and youth understand the difference; most youth do not have personal or social deficiencies (e.g., low self-esteem or lacking in skills); and peer pressure to

use drugs is overstated. More importantly, abstinence as a goal may not be realistic, especially with respect to alcohol. More feasible goals in this case would be delaying initiation and reducing heavy use (e.g., binge drinking) and problems from use.

School-based Harm Reduction Programs

School-based harm reduction programs aim to minimize the negative impact of substance use for the student and the community. This approach assumes that abstinence alone is not a realistic goal because experimentation during adolescence is normal, responsible use is plausible, and use does not equal abuse. Harm reduction school-based programs are rare, but researchers in Canada, Europe and Australia have highlighted a need to develop and evaluate these approaches, particularly for substances that have a high prevalence of use and normative nature, such as alcohol.

Hawks and colleagues (2002) highlight an effective alcohol harm reduction school program carried out in Australia. The School Health and Alcohol Harm Reduction Project (SHAHRP) was a two-year program that targeted students between 12-13 years of age. The program was delivered by teachers using an interactive delivery method, and content included basic information and strategies to reduce alcohol-related harms. Results of a quasi-experimental study showed reductions in hazardous alcohol consumption and harms among the intervention group. These reductions continued 17 months after the program ended (McBride et al., 2004).[15] Although positive effects were found, reviewers caution that more long-term studies of the SHAHRP are required before recommendations can be made.

Harm-reduction approaches have been applied to prevent drinking problems in university-age youth populations, although there are relatively few well-designed evaluations. Marlatt and colleagues (1998) conducted a randomized controlled trial to evaluate a brief intervention designed to reduce harms associated with heavy drinking among high-risk college students (19 years of age and younger). The intervention consisted of brief counselling sessions with personalized feedback and motivational interviewing techniques. Follow up after two years found that students in the intervention group showed significant reductions in heavy drinking and harmful consequences compared with the control group. The significant reductions in harmful consequences persisted three and a half years after the intervention (Baer et al., 2001).

Family-based Approaches

Protective factors within families are linked to a reduced likelihood of problem behaviours among children and adolescents. These protective factors include adequate monitoring and involvement in children's lives, close bonds, and communication of pro-social and healthy family values. Family-based substance use prevention programs have sought to improve parenting and family dynamics through education and skills training. Good evaluations of family programs are scarce mainly because of the difficulty in obtaining regular parental participation, and those that do participate already have better parenting skills and relationships with their children compared with parents who do not attend.

[15] The findings also showed reductions in total alcohol consumption in the intervention group compared with the control, but this difference decayed by the 17-month follow up.

Selective family programs that target high-risk families (e.g., families with low incomes, less education, parental substance abuse) are more promising than universal programs. Such programs aim to reduce family-based risk factors and strengthen protective factors linked to substance use among children and adolescents.

The Strengthening the Families Program (SFP) is an example of a successful program aimed at substance abusing parents with elementary school-aged children. The 14-week program includes parenting skills (i.e., discipline, monitoring), communication skills, and conflict-resolution. The SFP is also designed to decrease problematic behaviour in children and to improve family interaction. The format involves whole families coming together in a school, community centre, or other public place. The program offers free meals, transportation, and childcare as the basis to improve retention.

The SFP has been evaluated in several randomized control trials over a five-year follow-up period. The results showed that, compared with the control group, children in the experimental groups were significantly less likely to use alcohol or drugs and engage in other adolescent problem behaviours. Parents in the groups also showed decreased substance use (Kumpfer, Alvaradao & Whiteside, 2003).

The original SFP has been modified into a shorter universal program for families with young teens (ages 10-14). A six-year follow-up study of a randomized control trial, originally involving families of sixth graders with non-substance abusing parents, showed that students in the intervention group had significantly delayed initiation of alcohol use compared with control group students (Spoth et al., 2004).

SFP is one of the few family strategies showing long-term effectiveness in reducing alcohol consumption and harms. It has been adapted for families with older children and been replicated with positive results by independent researchers with different cultural groups.

A similar universal family program has shown effectiveness in preventing alcohol use among adolescents. Preparing for the Drug Free Years (PDFY) is family competency training program intended for parents with children 8 to 14 years of age. The PDFY is a five-session program that teaches parents skills to identify risk factors for substance abuse, enhance parent-child bonding, monitor and discipline their children, and manage family conflict. A three-year follow up of a randomized control trial found that children in the intervention group showed significant delays in the initiation of substance use when compared with the control group (Mason et al., 2003).

Another family program worth mentioning is the Adolescent Transitions Program, which utilizes a multi-level parent intervention within the school context. At the universal level, all students in grade 6 receive school-based curriculum with homework activities requiring interaction with parents. The parents are invited to an in-school meeting and are provided written and video material on parenting skills, and can access a trained consultant to assist with parenting concerns. At the next level, a “family check-up” offers a family assessment to identify high-risk families, who are then offered motivation feedback sessions with a family therapist. This is a three-year program, starting in grade 6. Results of a randomized control trial showed a significant short-term effect at one-year follow up. The program was successful in preventing substance use

among intervention students in grade 9, both high-risk and average-risk students (Dishion et al., 2002). Longer-term effects are not known. This program is currently being replicated with another cohort of students and until results are known, it can only be considered as promising.

Mass Media Approaches

There are few good studies evaluating mass media interventions that utilize proper baseline data and controls to ensure validity, simply because these are difficult to implement in the general population. The evidence shows that mass media campaigns that seek to curb substance use or misuse cannot change behaviour, but they can increase knowledge and awareness. Experts suggest that campaigns can be used successfully in conjunction with other community-wide interventions, as the media can function as an agenda-setting mechanism. A campaign used in this respect can increase community awareness, increase support for new policy initiatives, and change acceptable norms (Hawks et al., 2002; Loxley et al., 2004).

Community-based Approaches

There is a large amount of research on risk and protective factors for substance abuse identifying predictive variables across different contexts — the individual, school, family, peer group, and community. At the community level, the established risk factors include: high alcohol/drug availability, laws and norms favourable to alcohol/drug use, community disorganization (e.g., high crime, physical deterioration, low neighbourhood attachment), extreme economic deprivation (e.g., poverty, poor housing), and very high unemployment (Hawkins, Catalano, & Miller, 1992; Loxley et al., 2004). Whether a community is rural or urban does not appear to be a significant factor.

In recent years, researchers and practitioners have supported the idea of community mobilization that involves a set of prevention activities in a specific geographical region or a cultural community. This approach requires partnerships between several key stakeholders (e.g., health services, police, the justice system, local businesses) to coordinate a range of complementary interventions. It is assumed that a combination of several interventions at various levels is more effective than a single element intervention because it communicates consistent norms regarding unacceptable behaviours. Given the complexity of mounting a community intervention and the difficulty in ensuring proper evaluation, there have been only a small number of rigorous studies, and these have sought to reduce alcohol use and related harms.

The largest and most methodologically rigorous community alcohol prevention intervention was the five-year Community Trial Project (Holder et al., 2000). This project aimed to reduce alcohol-related harms, rather than consumption, across three communities and included matched control communities. The components included responsible beverage service in licences establishments; enforcement of sales to minors laws; enforcement of drinking and driving laws; policies to reduce alcohol availability; and a media and mobilization component which used campaigns and the local news to garner support for the policies. The results of this quasi-experimental study showed significant reductions in nighttime injury crashes, assault injuries in emergency departments, alcohol sales to minors, and heavy drinking in the intervention communities.

Another large randomized trial involving 15 communities was The Communities Mobilizing for Change on Alcohol (CMCA) intervention (Wagenaar et al., 2000). The aim was to reduce alcohol accessibility to underage youth. Components included increased enforcement of laws regarding sales to minors, shortened hours of sale, responsible beverage service, alcohol free events for youth, preventing underage parties at hotels, and providing information to parents. After three years, results showed reductions in sales to minors in retail outlets, attempts by underage youth to buy alcohol, and in drinking and driving among 18 to 20-year-olds in the experimental communities. There was, however, no statistically significant impact on youths' drinking behaviour.

Project Northland was a multi-component, long-term control trial that was community randomized and specifically designed to prevent or reduce alcohol use among students. The intervention was conducted in three phases in 20 rural school districts. Phase 1 was delivered when the students were in grades 6 to 8 and included a school-based program (social influence curriculum with peer leaders), parental education, peer leadership of alcohol-free extracurricular activities, and community-wide task forces. An interim (second) phase of the study occurred when the students were in grades 9 and 10. During those years, only minimal intervention (i.e., a short classroom program) took place. Phase 3 was implemented when the cohort was in grades 11 and 12 and focused on community organization and policies to reduce youth access to alcohol (e.g., responsible beverage service). Other components included a school-based curriculum on the legal consequences of underage alcohol use, parent education, print media used to advertise community events, and a larger campaign to discourage providing alcohol to adolescents.

An analysis comparing the patterns of alcohol use between the treatment and control groups was conducted for all three phases. During Phase 1, the increase in alcohol use was significantly greater in the control group when compared with the intervention group. Conversely, during the interim phase the increase in alcohol use was significantly greater in the intervention group when compared with the control group. During this phase, the students in the intervention group seemed to return to the level of drinking that was normative in their communities. During Phase 3, the increase in alcohol use was again greater in the control group than in the intervention group, however, the effect was not as strong as was found in Phase 1. Further, there was a significant reduction in alcohol sales to underage persons in the intervention group (Perry et al., 2002).

One notable community intervention specifically designed to reduce drinking and driving was the Saving Lives program by Hingson and colleagues (1996). This was a quasi-experimental study involving six communities, each of which used a program with media campaigns and a host of complimentary interventions (e.g., drunk driving awareness days, speed watch phone hotlines, school-based education, and Students Against Drunk Driving chapters). After five years of the program the experimental communities had declines in alcohol-related and non-alcohol related crashes, injured drivers who had been drinking, and crash injuries among youth.

Regulatory Approaches

There is a strong consensus within the systematic reviews on alcohol regulatory studies conducted worldwide that policy approaches are among the most effective strategies in preventing or reducing alcohol use in the general population, as well as in reducing the

associated harms.[16] There are various policies that have been shown to achieve these objectives, in North America and elsewhere, by changing the environment to make drinking less likely, such as reducing either the physical or economic availability of alcohol.

Several international economic studies have substantiated that increases in the price of alcohol leads to an overall reduction in consumption and alcohol-related harm (e.g., drinking-driving and violent and non-violent crime). These findings offer support for public policy initiatives such as increasing the price of alcohol through taxes and bans on price discounting. This approach targets high-risk drinkers (e.g., heavier and younger drinkers) who are more responsive to price increases when compared with the general population of drinkers (Loxley et al., 2004).[17] Youth and heavy drinkers are more price-sensitive because youth have less disposable income, and heavy drinkers must use a greater percentage of their disposable income when the price of alcohol is higher.

The convenience of obtaining any product is related to its use. Several policies that aim to limit the physical availability of alcohol are effective strategies in reducing use in the population. In Canada, the United States, and elsewhere, numerous studies have examined the impact of changes in the minimum legal drinking age. These studies have shown that increasing the drinking age significantly decreases drinking among youth and drinking and driving. Strong enforcement of the legal drinking age can reduce sales of alcohol to minors, especially when combined with media campaigns (Holder, 2003).

There is a trend in Canada and most developed countries to liberalize controls around alcohol sales. At the same time, studies have shown that increasing the hours or days of sale is strongly associated with increases in heavy drinking and associated harms (e.g., public drunkenness, violence, traffic crashes). Conversely, studies of restricting hours or days of sale show reductions in drinking and related problems. There is also good evidence that shows higher alcohol outlet density is predictive of higher alcohol consumption and related harms in a community. Reducing the number of alcohol outlets in a community would be another way of reducing use and harms. Indeed, some researchers estimated that a 10 percent decrease in a community's alcohol outlet density would reduce consumption of wine and spirits ranging from one to four percent (Gruenewald, Ponicki & Holder, 1993).

The use of Responsible Beverage Service (RBS) involves creating clear policies to train servers in licensed establishments on how to refuse service to intoxicated patrons and minors. Studies show that RBS is effective in reducing the number of intoxicated persons leaving a bar, and the number of traffic crashes, but the evidence for reductions in sales to minors has not been clearly established.

The results of studies of the effects of alcohol advertising restrictions on consumption and related problems have generally shown inconsistent results. Countries that apply tight restrictions on advertising experience less drinking and related harms (Alcohol and Public Policy Group, 2003),

[16] For example, drinking and driving, road crashes, crime, violence, morbidity and mortality.

[17] There are also other economic studies demonstrating that increasing the price of alcohol, especially beer, would significantly reduce drinking and driving and violent behaviour among youth (Holder, 2003).

but restricting alcohol advertising toward youth has not been shown to affect alcohol consumption among this group (Holder, 2003).

Loxley and colleagues (2004) reviewed interventions implemented in several Indigenous communities in Australia. They concluded that those communities declaring themselves as "dry," and those that implemented a range of alcohol restrictions (e.g., price control and limiting hours of sale) experienced a reduction in consumption, hospital admissions, and arrests over time.

Various policies to prevent drinking and driving and related traffic crashes have been studied in various western countries and show robust positive effects. The strongest evidence exists for Random Breath Testing (RBT). This approach requires continuous stops of drivers by the police to administer breath test to determine the driver's blood alcohol level. RBT is deemed more effective than using selective testing checkpoints, and it is most effective with a combination of highly visible police enforcement and a mass media campaign. Lowering the legal blood alcohol concentration is another successful strategy to reduce drinking-driving, when coupled with sustained enforcement. Zero-tolerance laws for underage drivers with automatic licence suspension have been found to reduce fatal crashes and injuries among young drivers when combined with enforcement and media campaigns. A graduated licensing system, which limits where and when young drivers can drive, has shown effectiveness in reducing alcohol-related crashes.

Regulatory strategies to prevent or reduce illicit drug use have received relatively less evaluation, compared with alcohol, largely due to its covert nature. Among the few studies in this area, most have methodological weaknesses (i.e., lack of baseline data, objective outcomes, sufficient follow up time). It is well known by now that zero-tolerance approaches (e.g., US policies that impose equally severe sanctions for all levels of offences) and increased police enforcement have not reduced drug use and have increased incarceration rates (Hawks et al., 2002). One emerging area of study has been decriminalizing the personal use of cannabis, where criminal penalties are substituted by civil penalties. Studies show that these policies do not result in more widespread use of cannabis, and they can save considerable policing and court costs, not to mention reducing alienation and social harm to the individual (Hawks et al., 2002; Loxley et al., 2004).

The Developmental Risk and Protective Factors Approach

Currently, there is a growing shift among prevention researchers toward interventions that seek to reduce the known developmental risk factors and strengthen protective factors that are common to many problem behaviours among youth (i.e., substance abuse, violence, risky sexual activity), rather than focus on issue-specific programs (Catalano et al., 2004). This type of broad-based prevention strategy grew from an acknowledgement that problem behaviours tend to cluster in certain types of individuals or certain types of social settings. There is a vast range of social and individual risk factors that predispose adolescents and adults to health and social problems. These factors lie at the individual, family, school, and environmental levels and some are malleable while others are not. For example, risk factors at the family level include poor parental skills in terms of monitoring children, parent-child conflict, and parental substance abuse. School risk factors include poor academic achievement and low school bonding. Environmental risk factors include high unemployment in the community, community

disorganization, and poverty. Researchers hold that it is feasible and cost-effective to target multiple outcomes with a coordinated set of positive child development and health promotion programs.

A group of researchers are applying this risk-reduction/resiliency framework using school and family interventions in order to improve the environment for healthy child development. One such program, Fast Track (one of the largest prevention trials ever funded in the United States), seeks to increase school bonding, academic performance, and improve relationships with parents during the early primary school years (starting in grade 1). The ultimate goals are to reduce drug use, delinquency, risky sexual behaviour, and mental health problems during adolescence. While early follow ups (end of grade 5) have showed improvements in most risk factors studied the long-term impact on substance use is much anticipated by prevention experts (Conduct Problems Prevention Research Group, 2004; Loxley et al., 2004).

Preventing Fetal Alcohol Spectrum Disorder

Special mention must be made here about strategies to prevent fetal alcohol spectrum disorder (FASD). FASD refers to a group of physical and mental birth defects caused by maternal consumption of alcohol during pregnancy. FASD is characterized by a particular pattern of facial anomalies, growth deficiency, and central nervous system damage. FASD is the leading known cause of mental retardation and developmental disabilities in the western world. While FASD occurs when there is heavy alcohol consumption during pregnancy, lower levels of drinking may lead to alcohol-related neurodevelopmental disorder, defined as cognitive and behavioural problems in children. The best way to prevent FASD and other alcohol-related effects is complete abstinence throughout pregnancy. To date, prevention efforts span a broad spectrum from public health education to direct interventions targeted at high-risk pregnant women.

Universal prevention attempts to educate the public about the risks of drinking during pregnancy. One popular strategy that has been studied in the United States is the placement of health warning labels on alcohol beverage containers. Numerous studies have shown that the general public's knowledge about the results of drinking during pregnancy increased after the label's implementation in 1989, but this awareness attenuated over time. More importantly, the label's impact on drinking during pregnancy has been modest and any decreases were short-lived. While researchers acknowledge that warning labels or other mass media information strategies do not affect women who drink heavily during pregnancy, labels can at least serve to inform the public about potential risks (Hankin, 2002).

There are only a few randomized clinical studies that evaluate interventions designed to prevent or significantly reduce alcohol use by pregnant women. Project TrEAT (Trial for Early Alcohol Treatment) was a selective prevention program targeting women of childbearing age who were screened for problem drinking in a primary care setting. These women were randomly assigned to either a brief intervention group or a control group. The brief intervention consisted of two 15-minute counselling sessions with a physician that included a discussion of alcohol's adverse effects, a drinking agreement, and cards to record alcohol intake. Participants had followed ups over a four-year period. The findings showed that the women in the intervention group who became pregnant during this period had significantly reduced their weekly alcohol consumption and binge drinking compared with women in the control group (Manwell et al., 2000).

There are positive effects for indicated FASD prevention strategies that target women at the highest risk (e.g., women with a history of drinking during pregnancy or previously delivered a child with FAS). The Protecting the Next Pregnancy project showed positive results by targeting women who drank heavily during the last pregnancy (Hankin, 2002). Researchers identified and recruited women in a hospital's postpartum unit who consumed alcohol during the course of their pregnancy. Women were randomly assigned to either the control group or an intervention group. The control group received no intervention, while the intervention group received an intensive brief intervention designed to prevent or reduce drinking during the women's future pregnancies. The intervention included five sessions with a counsellor delivered immediately following the birth of the child and continuing for 12 months. Booster sessions were given over the five-year follow-up period. The findings showed that women in the intervention group drank significantly less during subsequent pregnancies compared with women in the control group. This resulted in improved birth outcomes and healthier children among women in the intervention group.

References

Aeschbach, E., (1998). *Heroin Distribution in Switzerland: Analysis of the Scientific Value of the Evaluation.* Zug, Switzerland: Schweizer Arzte gegen Drogen.

Alcohol and Public Policy Group. (2003). Alcohol: No Ordinary Commodity. A summary of the book. *Addiction*, 98(10), 1343-1350.

Alho, H. (2002). Drug treatment of alcohol dependence: An evidence based review. *Psychiatria Fennica*, 33, 76-85.

Allsop, S., Saunders, B., Phillips, M., & Carr, A. (1997). A trial of relapse prevention with severely dependent male problem drinkers. *Addiction, 92(1),* 61-73.

Alterman, A. I., O'Brien, C. P., McLellan, T., August, D. S., Snider, E. C., Droba, M., Cornish, J. W., Hall, C. P., Raphaelson, A. H., & Schirade, F. X. (1994). Effectiveness and costs of inpatient versus day hospital cocaine rehabilitation. *The Journal of Nervous and Mental Disease, 182,* 157-163.

Apodaca, T.R., & Miller, W.R. (2003). Meta-analysis of the effectiveness of bibliotherapy for alcohol problems. *Journal of Clinical Psychology*, 59(3), 289-304.

Ballesteros, J., Duffy, J., Querejeta, I., Arino, J., and Gonzalez-Pinto, A. (2004). Efficacy of Brief Interventions for Hazardous Drinkers in Primary Care: Systematic Review and Meta-Analyses. *Alcoholism: Clinical & Experimental Research*, 28(4): 608-618.

BC Centre for Excellence in HIV/AIDS. (2004). *Evaluation of the Supervised Injection Site. Year one summary.* Retrieved February 25, 2005, from http://www.vch.ca/sis/Docs/esis_year_one_sept16_042.pdf

Beauvais, F. (1990). *Inhalant Abuse Among Sioux Indians.* Bea Medicine Department of Anthropology. Unpublished manuscript.

Belenko, S., Patapis, N., and French, M.T. (2005) economic benefits of drug treatment: a critical review of the evidence for policy makers; Treatment Research Institute at the University of Pennsylvania. Available online: http://www.uwstout.edu/solutions/ces/ruralaoda/documents/EconomicBenefits_2005Feb.pdf

Best, D., Gossop, M., Marsden, J., Lehmann, P., & Strang, J. (1999). Continued heroin use during methadone treatment: relationships between frequency of use and reasons for reported heroin use. *Drug and Alcohol Dependence, 53*, 191-195.

Bien, T.H., Miller, W.R., & Tonigan, S. (1993). Brief intervention for alcohol problems: a review. *Addiction,* 88, 315-335.

Breslin, F., Sobell, M.B., Sobell, L.C., Cunningham, J.A., Sdao-Jarvie, K., & Borsoi, D. (1998). Problem drinkers: evaluation of a stepped care approach. *Journal of Substance Abuse*, 10(3), 217-232

Brown, T., Donglier, M., and Graves G. (2005). *Substance Abuse in Canada.* Ottawa: Canadian Centre on Substance Abuse.

Bullock, M.L., Kiresuk, T.J., Sherman, R.E., Lenz, S.K., Culliton, P.D., Boucher, T.A., & Nolan, C.J. (2002). A large randomized placebo controlled study of auricular acupuncture for alcohol dependence. *Journal of Substance Abuse Treatment*, 22(2), 71-77.

Burke, B.L., Arkowitz, H., & Menchola, M. (2003). The efficacy of motivational interviewing: A meta-analysis of controlled clinical trials. *Journal of Consulting and Clinical Psychology*, 71(5), 843-861.

Carroll, K.M., Rounsaville, B.J., and Keller, D.S. (1991) Relapse prevention strategies for the treatment of cocaine abuse. *American Journal of Drug and Alcohol Abuse* 17(3): 249-265.

Catalano, R. F., Berglund, M. L., Ryan, J. A. M., Lonczak, H. S., & Hawkins, J. D. (2004). Positive youth development in the United States: Research findings on evaluations of positive youth development programs. *The ANNALS of the American Academy of Political and Social Science, 591*(1), 98-124.

Chang, G., Wilkins-Haug, L., Berman, S., & Goetz, M. A. (1999). Brief intervention for alcohol use in pregnancy: A randomized trial. *Addiction, 94*(10), 1499-1508.

Coggans, N., Cheyne, B., & McKellar, S. (2003). *The Life Skills Training drug education programme: A review of research*. Glasgow: Scottish Executive, Drug Misuse Research Programme.

Compton, P.A., Ling, W., Charuvastra, V.C., & Wesson, D.R. (1995). Buprenorphine as a pharmacotherapy for cocaine abuse: A review of the evidence. *Journal of Addictive Diseases*, 14(3), 97-114.

Compton, W.M., & Pringle, B. (2004). Services research on adolescent drug treatment. Commentary on "The Cannabis Youth Treatment (CYT) Study: Main findings from two randomized trials". *Journal of Substance Abuse Treatment*, 27(3), 195-196.

Conduct Problems Prevention Research Group. (2004). The effects of the Fast Track program on serious problem outcomes at the end of elementary school. *Journal of Clinical Child and Adolescent Psychology, 33*(4), 650-661.

Connors, G., Tarbox, A., & Faillace, L. (1992). Achieving and maintaining goals among problem drinkers: Process and outcome results. *Behavioural Psychotherapy, 14,* 34-45.

Coyle, S.L., Needle, R.H., & Norman, J. (1998). Outreach-based HIV prevention for injecting drug users: A review of published outcome data. *Public Health Reports*, 113 (Supplement 1), 19-30.

Crits-Christoph, P., & Siqueland, L. (1996). Psychosocial treatment for drug abuse: Selected review and recommendations for national health care. *Archives of General Psychiatry*, 53(8), 749-756.

Cuijipers, P. (2002). Effective ingredients of school-based drug prevention programs: A systematic review. *Addictive Behaviors*, 27(6), 1009-1023.

Dawe, S., Powell, J., Richards, D., Gossop, M., Marks, I., Strang, J. &Gray, J. (1993) Does post-withdrawal cue exposure improve outcome in opiate addiction: A controlled trial. *Addiction* 88(9): 1233-1245.

Dawe, S., Rees, V., Mattick, R., Sitharthan, T., & Heather, N. (2002). Efficacy of moderation-oriented cue exposure for problem drinkers: A randomized controlled trial. *Journal of Consulting & Clinical Psychology,* 70(4), 1045-50.

de Lima, M.S., Soares, G.D., Reisser, A.A.P., & Farrell, M.(2002). Pharmacological treatment of cocaine dependence: A systematic review. *Addiction*, 97(8), 931-949.

Dennis, M., Godley, S.H., Diamond, G., Tims, F.M., Babor, T., & Donaldson, J. (2004). The Cannabis Youth Treatment (CYT) Study: Main findings from Two randomized trials. *Journal of Substance Abuse Treatment*, 27(3), 197-213.

Dishion, T. J., Kavanagh, K., Schneiger, A., Nelson, S., & Kaufman, N. K. (2002). Preventing early substance use: A family-centered strategy for the public middle school. *Prevention Science,* 3(3), 191-201.

Dolan, K. (1999). Injecting rooms in Switzerland. *NSW Public Health Bulleti*n, 10(6), June, 59-60.

Finney, J.W., & Monohan, S.C. (1996). The Cost-effectiveness of Treatment for Alcoholism: A Second Approximation. *Journal of Studies on Alcohol*, 57(3), 229-243.

Fiorentine, R., and Anglin, D. (1996), Does increasing the opportunity for counselling increase the effectiveness of outpatient drug treatment? *Journal of Substance Abuse Treatment,* 13, 241-248.

Foxcroft, D. R., Ireland, D., Lister-Sharp, D., Lowe, G., & Breen, R. (2003). Long-term primary prevention for alcohol misuse in young people: a systematic review. *Addiction*, 98(4), 397-411.

Gibson, D.R., Flynn, N.M., & Perales, D. (2001). Effectiveness of syringe exchange programs in reducing HIV risk and HIV seroconversion among injection drug users. *AIDS*, 15(1), 1329-1341.

Goldstein, M.F., Deren, S., Magura, S., Kayman, D.J., Beardsley, M., & Tortu, S. (2001). Cessation of Drug Use: Impact of time in Treatment. *Journal of Psychoactive Drugs*, 33(3), 302-310.

Gorman, D.M. (2002). The "science" of drug and alcohol prevention: the case of the randomized trial of the Life Skills Training program. *International Journal of Drug Policy*, 13(1), 21-26.

Gorman, D.M. (2003). The best of practices, the worst of practices: the making of science-based primary prevention programs. *Psychiatric Services,* 54(8), 1087-1089.

Gorski, T.T. (1989). *Passages Through Recovery: An Action Plan For Preventing Relapse*. Center City, MN: Hazelden.

Graham, K., Annis, H.M., Brett, P.J., and Venesoen, P. (1996) A controlled field trial of group versus individual cognitive-behavioral training for relapse prevention. *Addiction,* 91(8): 1127-1139.

Graves, G., & Rotgers, F. (1999). *Differential substance abuse treatment (DSAT) System for the Maine Department of Corrections.* Washington: US Health and Human Services.

Gruenewald, P. J., Ponicki, W. R., & Holder, H. D. (1993). The relationship of outlet densities to alcohol consumption: a time series cross-sectional analysis. *Alcoholism, Clinical and Experimental Research,* 17(1), 38-47.

Hankin, J. R. (2002). Fetal Alcohol Syndrome prevention research. *Alcohol Research and Health,* 26(1), 58-65.

Harrison, S., & Carver, V. (2004). *Alcohol and Drug Problems: A Practical Guide for Counsellors.* Toronto: Centre for Addiction and Mental Health.

Harwood, H.J., Malhotra, D., Villarivera, C., Liu, C., Chong, U., and Gilani, J. (2002) Cost Effectiveness and Cost Benefit Analysis of Substance Abuse Treatment: A Literature Review. Fairfax VA: National Evaluation Data Services.

Hawkins, J.D., Catalano, R.F., Gillmore, M.R., Wells, E.A, (1989) Skills training for drug abusers: Generalization, maintenance, and effects on drug use. *Journal of Consulting and Clinical Psychology*, 7(4): 559-563.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. Psychological Bulletin, 112(1), 64-105.

Hawks, D., Scott, K., McBride, N., Jones, P., & Stockwell, T. (2002). *Prevention of psychoactive substance use: A selected review of what works in the area of prevention*. Geneva: World Health Organization.

Health Canada. (1999). *Best practices - substance abuse treatment and rehabilitation*. Ottawa: Minister of Public Works and Government Services.

Health Canada. (2000). *Cocaine Use: Recommendations in Treatment and Rehabilitation*. Ottawa: Minister of Public Works and Government Services.

Health Canada. (2001). *Best practices - treatment and rehabilitation for women with substance use problems*. Ottawa: Minister of Public Works and Government Services.

Health Canada. (2002a). *Best Practices - Methadone Maintenance Treatment.* Ottawa: Minister of Public Works and Government Services.

Health Canada. (2002b). *Best Practices - Treatment and Rehabilitation for Seniors with Substance Use Problems* . Ottawa: Minister of Public Works and Government Services.

Health Canada. (2002c). *Best practices treatment and rehabilitation for youth with substance abuse problems*. Ottawa: Minister of Public Works and Government Services.

Health Canada. (2002d). *Best practices concurrent mental health and substance use disorders*. Ottawa: Minister of Public Works and Government Services.

Heather, N., Brodie, J., Wale, S., Wilkinson, G., Luce, A., Webb, E., & McCarthy, S. (2000). A Randomized Controlled Trial of Moderation-Oriented Cue Exposure. *Journal of Studies on Alcohol*, 61(4), 561-570.

Hester, R., & Delaney, H. (1997). Behavioral self-control program for Windows: results of a controlled clinical trial. *Journal of Consulting and Clinical Psychology*, 65(4), 686-693.

Hingson, R., McGovern, T., Howland, J., Heeren, T., Winter, M., & Zakocs, R. (1996). Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program. *American Journal of Public Health*, 86(6), 791-797.

Holder, H. (2003). *Strategies for reducing substance abuse problems: What research tells us.* Paper presented at the NDRI International Research Symposium "Preventing Subsance Use, Risky Use, and Harm: What is Evidenced-Based Policy?" Australia: Fremantle.

Holder, H. D., Gruenewald, P. J., Ponicki, W. R., Treno, A. J., Grube, J. W., Saltz, R. F., Voas, R. B., Reynolds, R., Davis, J., Sanchez, L., Gaumont, G., & Roeper, P. (2000). Effect of Community-Based Interventions on High-Risk Drinking and Alcohol-Related Injuries. *Journal of the American Medical Association,* 284(18), 2341-2347.

Holder, H., Longabaugh, R., Miller, W., & Rubonis, A.V. (1991). The Cost Effectiveness of Treatment for Alcoholism: A First Approximation. *Journal of Studies on Alcohol*, 52(6), 517-525.

Hubbard, R.L. and Rachal, J. (1984). Treatment Outcome Prospective Study (TOPS). Client Characteristics and Behaviors Before, During and After Treatment. In F.M. Tims, J.P. Ludford (eds.), *Drug Abuse Treatment Evaluation: Strategies, Progress and Prospects*. Rockville, MD: National Institute on Drug Abuse.

Humphreys, K. & Klaw, E. (2001). Can targeting nondependent problem drinkers and providing internet-based services expand access to assistance for alcohol problems? A study of the moderation management self-help/mutual aid organization. *Journal of Studies on Alcohol,* 62(4), 528-532.

Hunt, N., Trace, M., Bewley-Taylor, D. (2004). Reducing Drug-related Harms to Health: An overview of the Global evidence. The Beckley Foundation Drug Policy Programme.

Institute of Medicine, National Academy of Sciences (1990) Broadening the Base of Treatment for Alcohol Problems. Washington, DC: National Academy of Science Press.

Karst, M., Passie, T., Friedrich, S., Wiese, B., & Schneider, U. (2002). Acupuncture in the treatment of alcohol withdrawal symptoms: A randomized, placebo-controlled inpatient study. *Addiction Biology*, 7(4), 415-419.

Korhonen, M. (2004). *Alcohol Problems and Approaches: Theories, Evidence and Northern Practice*. Ottawa: National Aboriginal Health Organization.

Kownacki, R.J., & Shadish, W.R. (1999). Does Alcoholics Anonymous Work? The results form a meta analysis of controlled experiments. *Substance Use and Misuse*, 34(13), 1897-1916.

Kumpfer, K. L., Alvarado, R., & Whiteside, H. O. (2003). Family-based interventions for substance use and misuse prevention. *Substance Use and Misuse, 38*(11/13), 1759-1787.

Landry, M. (1995). *Overview of Addiction Treatment Effectiveness*. Rockville, MD: SAMHSA, Office of Applied Studies**.**

Langendam, M.W., VanBrussel, G.H.A., Coutinho, R.A., and VanAmeijden, J.C. (2000). Methadone maintenance and cessation of injecting drug use: results from the Amsterdam cohort study. *Addiction*, 95, 591-600.

Lines, R., Jürgens, R., Betteridge, G., Stöver, H., Laticevschi, D., & Nelles, J. (2004). *Prison Needle Exchange: Lessons from a Comprehensive Review of International Evidence and Experience*. Montreal: Canadian HIV/AIDS Legal Network. Retrieved February 25, 2005, from http://www.aidslaw.ca/Maincontent/issues/prisons/pnep/PNEP-report.pdf .

Ling, W, Charuvastra, C, Kaim, SC, Klett, CJ. Methadyl acetate and methadone as maintenance treatments for heroin addicts. A veterans administration cooperative study. Arch Gen Psychiatry 1976; 33:709-20.

Longabaugh, R., & Morgenstern, J. (1999). Cognitive-behavioral coping-skills therapy for alcohol dependence. Current status and future directions. *Alcohol Research and Health: the Journal of the National Institute on Alcohol Abuse and Alcoholism,* 23(2), 78-85.

Loxley, W., Toumbourou, J. T., Stockwell, T., Haines, B., Scott, K., Godfrey, C., Watters, E., Patton, G., Fordham, W., Gray, D., Marshall, J., Ryder, D., Saggers, S., Sanci, L. & Williams, J. (2004). *The prevention of substance us, risk and harm in Australia: A review of the evidence*. Melbourne: National Drug Research Institute and the Centre for Adolescent Health.

Manwell, L. B., Fleming, M. F., Mundt, M. P., Stauffacher, E. A., & Barry, K. L. (2000). Treatment of problem alcohol use in women of childbearing age: Results of a brief intervention trial. *Alcoholism, Clinical and Experimental Research*, 24(10), 1517-1524.

Marlatt, G. A., Baer, J. S., Kivlahan, D. R., Dimeff, L. A., Larimer, M. E., Quigley, L. A., Somers, J. M., & Williams, E. (1998). Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment. *Journal of Consulting and Clinical Psychology*, 66(4), 604-615.

Marlatt, G., & Gordon, J. (1985). *Relapse Prevention: Maintenance Strategies in the Treatment of Addictive Behaviors*. New York: The Guildford Press.

Mason, W. A., Kosterman, R., Hawkins, J. D., Haggerty, K. P., & Spoth, R. L. (2003). Reducing adolescents' growth in substance use and delinquency: Randomized trial effects of a parent-training prevention intervention. *Prevention Science,* 4(3), 203-212.

Mattick, R., & Jarvis, T. (1993). *An outline for the management of alcohol problems: Quality Assurance in the Treatment of Drug Dependence Project. Monograph No. 20*. Canberra: National Drug Strategy, Commonwealth Department of Human Services and Health.

Mattick, R.P., Kimber, J., Kaldor, J., MacDonald, M., Weatherburn, D., & Lapsley, H. (2001). *Six-month process evaluation report on the Medically Supervised Injecting Centre (MSIC)*. Sydney: National Drug and Alcohol Research Centre.

Mayer, D.J. (2000). Acupuncture: An evidence-based review of the clinical literature. *Annual Review of Medicine*, 51, 49-63.

McBride, N., Farringdon, F., Midford, R., Meuleners, L., & Phillips, M. (2004). Harm minimization in school drug education: final results of the School Health and Alcohol Harm Reduction Project (SHAHRP). *Addiction*, 99(3), 278-291.

McKay, J.R. Alterman, A.I., Cacciola, J.S, Rutherford, M.J., O'Brien, C.P., and Koppenhaver, J. (1997) Group counseling versus individualized relapse prevention aftercare following intensive outpatient treatment for cocaine dependence: Initial results. *Journal of Consulting and Clinical Psychology* 65(5): 778-788,

McLellan, A.T., Grissom, G.R., Zanis, D., Randall, M., Brill, P., & O'Brien, C.P., (1997). Problem-service 'matching' in addiction treatment: A prospective study in 4 programs. *Archives of General Psychiatry*, 54(8), 730-735.

McLellan, A.T., Hagan, T.A., Levine, M., Gould, F., Meyers, K., Bencivengo, M., & Durell, J. (1998). Supplemental social services improve outcomes in public addiction treatment. *Addiction*, 93(10), 1489-1499.

McLellan, A.T., & Meyers, K. (2004). Contemporary addiction treatment: A review of systems problems for adults and adolescents. *Biological Psychiatry*, 56(10), 764-770.

McLellan, A., Woody, G., Luborsky, L. & Goehl, L. (1988) Is the Counsellor an Active Ingredient in Substance Abuse Rehabilitation. An Examination of Treatment Success Among Four Counsellors, *Journal of Nervous and Mental Disease,* 176, pp.423-430.

Miller, W., Brown, J., Simpson, T., Handmaker, N., Bien, T., Luckie, L., Montgomery, H., Hester, R., & Tonigan, J. (1995). What works? A methodological analysis of the alcohol treatment outcome literature. in Hester, R.K., & Miller, W.R. (Eds.), *Handbook of Alcoholism Treatment Approaches: Effective Alternatives*. Boston: Allyn & Bacon.

Miller , W.R., & Rollnick, S. (2002). *Motivational Interviewing (2nd edition): Preparing People for Change.* New York: Guilford Press.

Monti, P., Gulliver, S., & Myers, M. (1994). Social skills training for alcoholics: Assessment and treatment. *Alcohol and Alcoholism,* 29(6), 949-964.

Moyer, A., Finney, J.W., Swearingen, C.E., & Vergun, P. (2002). Brief interventions for alcohol problems: a met-analytic review of controlled investigations in treatment seeking and non-treatment seeking populations. *Addiction*, 97(3), 279-292.

Najavits, L., & Weiss, R. (1994). Variations in therapist effectiveness in the treatment of patients with substance use disorders: an empirical review. *Addiction*, 89(6), 679-688.

National Institute on Drug Abuse. (1999). *Principles of drug addiction treatment: A research-based guide.* Washington, DC: National Institute of Health.

National Institute on Drug Abuse. (2005). *Principles of Drug Addiction Treatment: A Research Based Guide*. Retrieved February 25, 2005, from http://www.drugabuse.gov/PODAT/PODATIndex.html.

O'Farrell, T., Choquette, K., Cutter, H., Brown, E., & McCourt, W. (1993). Behavioral marital therapy with and without additional couples relapse prevention sessions for alcoholics and their wives. *Journal of Studies on Alcohol,* 54(6), 652-999.

Ogborne, A.C., & Kapur, B. (1987). Drug use in a sample of males admitted to an alcohol detoxification centre. *Alcoholism: Clinical and Experimental Approaches*, 11, 183-185.

Ossip-Klein, D.J., & Rychtarik, R.G. (1993). Behavioral Contracts Between Alcoholics and Family Members to Improve Aftercare Participation and Maintain Sobriety After Inpatient Treatment. In O'Farrell, T.J. (Ed.), *Treating Alcohol Problems: Marital and Family Interventions* (pp. 281-304). New York: Guilford.

Perry, C. L., Williams, C. L., Komro, K. A., Veblen-Mortenson, S., Stigler, M. H., Munson, K. A., Farbakhsh, K., Jones, R. M., & Forster, J. L. (2002). Project Northland: long-term outcomes of community action to reduce adolescent alcohol use. *Health Education Research: Theory and Practice,* 17(1), 117-132.

Poikolainen K. (1999) Effectiveness of brief interventions to reduce alcohol intake in primary health care populations: a meta-analysis. *Preventive Medicine*, 28(5),503-509.

Project MATCH Research Group. (1997). Matching alcoholism treatments to client heterogeneity: Project MATCH posttreatment drinking outcomes. *Journal of Studies on Alcohol,* 58(1), 7-29.

Puplick, C. (2000) *Needle and Syringe Exchange Programs; A review of the evidence*. Australia: Australian National Council on AIDS, Hepatitis C and related diseases.

Rawson, R.A., Gonzales, R., & Brethen, P. (2002). Treatment of methamphetamine use disorders: An update. *Journal of Substance Abuse Treatment*, 23(2), 145-150.

Rawson, R.A., Marinelli-Casey, P., Anglin, M.D., Dickow, A., Frazier, Y., & Gallagher, C. (2004). A multi-site comparison of psychosocial approaches for the treatment of methamphetamine dependence. *Addiction*, 99(6), 708-717.

Rohsenow, D., Monti, P., Rubonis, A., Gulliver, S., Colby, S., Binkoff, J., & Abrams, D. (2001). Cue exposure with coping skills training and communication skills training for alcohol dependence: 6- and 12-month outcomes. *Addiction*, 96(8), 1161-1174.

Roozen, H.G., Boulogne, J.J., van Tulder, M.W., van den Brink, W., De Jong, C.A.J., & Kerkhof, A.J.F.M. (2004). A systematic review of the effectiveness of the community reinforcement approach in alcohol, cocaine and opioid addiction. *Drug and Alcohol Dependence*, 74(1), 1-13.

Rotgers, F., Kern, M.F., & Hoeltzel, R. (2002). *Responsible Drinking: A Moderation Management Approach for Problem Drinkers*. Oakland CA: New Harbinger Publications.

Rydell, C.P. and S.S. Everingham, *Controlling Cocaine: Supply versus Demand Programs*, 1994, Rand: Santa Monica, CA.

Sanchez-Craig, M. A. (1995). *DrinkWise: How to Quit Drinking or Cut Down: A Self-Help Book*. Toronto: Addiction Research Foundation, Centre for Addiction and Mental Health.

Schinke, S. P., Tepavac, L., & Cole, K. C. (2000). Preventing substance use among Native American youth: Three-year results. *Addictive Behaviours, 25*(3), 387-397.

Schmitz, J.M., Oswald, L.M., Jacks, S.D., Rustin, T., Rhoades, H.M., and Grabowski, J (1997) Relapse prevention treatment for cocaine dependence: Group vs. individual format. *Addictive Behaviors,* 22(3): 405-418.

Sells, S.B. and Simpson, D.D. (1974-76). *The Effectiveness of Drug Abuse Treatment*. 5 vols. Cambridge, MA: Ballinger.

Shand, F., Gates, J., Fawcett, J., & Mattick, R. (2003). *The treatment of alcohol problems: A review of the evidence*. Sydney: National Drug and Alcohol Research Centre.

Silverman, K., Wong, C., Higgins, S., Brooner, R., Montoya, I., Contoreggi, C., Umbricht-Schneiter, A., Schuster, C., Preston, K. (1996). Increasing opiate abstinence through voucher-based reinforcement therapy. Drug and Alcohol Dependence, 41, 157-165.

Simpson, D. and Savage, L. (1980). Drug abuse treatment re-admissions and outcomes. *Archives of General Psychiatry,* 37, 896-901.

Sitharthan, T., Sitharthan, G., Hough, M., & Kavanagh, D. (1997). Cue exposure in moderation drinking: a comparison with cognitive-behavior therapy. *Journal of Consulting and Clinical Psychology,* 65(5), 878-882.

Sobell, L.C., Sobell, M.B. Brown, J., Cleland, P.A. (1995) A randomized trial comparing group versus individual guided self-change treatment for alcohol and drug abusers Poster presented at.the 29th annual convention of the Association for the Advancement of Behaviour Therapy. Washington, D.C.

Spoth, R., Redmond, C., Shin, C., & Azevedo, K. (2004). Brief family intervention effects on adolescent substance initiation: School-level growth curve analyses 6 years following baseline. *Journal of Consulting and Clinical Psychology,* 72(3), 535-542.

Stanton, M.D., Shadish, W.R.(1997) Outcome, attrition, and family-couples treatment for drug abuse: a meta-analysis and review of the controlled, comparative studies. Psychological Bulletin.122(2),70-91.Tait, R.J., Hulse, G.K. (2003) A systematic review of the effectiveness of brief interventions with substance using adolescents by type of drug. *Drug and Alcohol Review* 22(3): 337-346.

Stephens, R. S., Roffman, R. A., & Simpson, E. E. (1994). Treating adult marijuana dependence: A test of the relapse prevention model. *Journal of Consulting and Clinical Psychology*, 62, 92–99.

Tait, R. J. & Hulse, G. K. (2003) A systematic review of the effectiveness of brief interventions with substance using adolescents by type of drug. *Drug & Alcohol Review,* 22, 337-346.

Toteva, S., & Milanov, I. (1996). The Use of Body Acupuncture for Treatment of Alcohol Dependence and Withdrawal Syndrome: A Controlled Study. *American Journal of Acupuncture,* 24(1), 19-25.

Uchtenhagen, A., Gutzwiller, F., & Dobler-Miklos, A. (1996). *Medical prescription of narcotics Research Program Final Report of the Principal Investigators*. Zurich: Institut fur Sozial- und praventivmedizin der Universitat Zurich.

United Nations Drug Control and Crime Prevention. (2000). Geneva: World Drug Report. UNDCCP.

United Nations General Assembly. (2001). *Final Declaration HIV/AIDS*. Retrieved February 25, 2005, from http://www.un.org/ga/aids/coverage/FinalDeclarationHIVAIDS.html .

United Nations Office for Drug Control. (2002). *Global illicit Drug Trends 2002*. New York: United Nations Office for Drug Control and Crime Prevention.

United Nations International Drug Control Programme (2002) Contemporary Drug Abuse Treatment: A review of the evidence. New York.

Van den Brink, W., Hendricks, V.M., Blanken, P., Koeter, M.W.J., Van Zwieten, B.J., Van Ree, J.M. (2003). Medical prescription of heroin to treatment resistant heroin addicts: two randomised controlled trials. Br*itish Medial Journal,* 327: 310-2.

Vaughn, M.G., & Howard, M.O. (2004). Adolescent substance abuse treatment: A synthesis of controlled evaluations. *Research on Social Work Practice*, 14(5), 325-335.

Wagenarr, A. C., Murray, D. M., Gehan, J. P., Wolfson, M., Forster, J. L., Toomey, T. L., Perry, C. L., & Jones-Webb, R. (2000). Communities Mobilizing for Change on Alcohol (CMCA): Outcomes from a randomized community trial. *Journal of Studies on Alcohol*, 61(1), 85-94.

Walters, G.D. (2002). Behavioral self-control training for problem drinkers: Meta-analysis of randomized control studies. *Behavior Therapy*, 31(1), 135-149.

Wells, E.A., Peterson, P.L., Gainey, R.R., Hawkins, J.D. and Catalano, R.F. (1994) Outpatient treatment for cocaine abuse: A controlled comparison of relapse prevention and 12 step approaches. *American Journal of Drug and Alcohol Abuse,* 20(1): 1-17.

WHO Committee on Drug Dependence. (1996). *WHO Committee on Drug Dependence, 30th Report*. Geneva: World Health Organization

.

WHO/UNODC/UNAIDS (2004). Policy brief : Substitution maintenance therapy in the management of opioid dependence and HIV/AIDS prevention.Available from http://www.who.int/hiv/pub/advocacy/idupolicybriefs/.

Wood, E., Kerr, T., Small, W., Li, K., Marsh, D.C., Montaner, J.S.C., & Tyndall, M.W. (2004). **Changes in public order after the opening of a medically supervised safer injecting facility for illicit injection drug users.** *Canadian Medical Association Journal*, 171(7), 731-734.

Appendix A: How can the effectiveness of interventions for substance abuse prevention, treatment, and harm reduction be determined?

Randomized Experiments

The preferred scientific method for establishing the effectiveness of any kind of intervention is to conduct a study that compares outcomes for those exposed to the intervention with the outcomes for others exposed to a relevant comparison intervention or to a non-intervention condition. The most convincing type of study is one in which people or groups with a condition (e.g. high risk communities, high risk youth, people dependent on opiates) are randomly assigned to receive either the intervention under investigation (e.g. eduction, counselling, clean needles) or to acomparison group (e.g. no eduction, no counselling or no needles). The aim of random assignment is to ensure the comparability of those exposed to different conditions. If this is the case one can be more confident that any observed differences in outcomes reflect differences in the effects of alternative interventions rather than differences in those exposed to these interventions.

In many studies of medical interventions, and especially studies of new therapeutic drugs, these randomized control studies are also "double blind" such that neither those delivering the interventions nor those receiving them are aware of what is being delivered. This is to minimize bias in assessment and to control for "placebo effects." This is generally not possible in studies of a substance abuse prevention or treatment initiative but other efforts to control for provider and participant biases and expectancies would ideally be made. This is especially so when there are high expectations that a new intervention will "work" and where the enthusiasm for the innovation may influence the quality of delivery and contribute to placebo effects. Of course, all outcome measures should be demonstrably valid and reliable and appropriate statistical tests should be used to decide if any differences in outcomes observed between those in the intervention or control conditions might have occurred by chance.

A single study showing the superiority of one type of intervention over another should not be taken as evidence that this intervention will always work or is superior under all conditions. It is only when the results have been replicated in other settings that one can begin to feel confident that the intervention is of value. The importance of successful replication of positive results derives from the possibility of making errors in the statistical comparison of the outcomes of the intervention being compared. When the conventional 5 percent level of "statistical significance" is used, it will be falsely concluded that one intervention is superior to another 5 percent of the time. The chance of making the same error in a series of decisions decreases dramatically as the number of replications increases. The more reliably a difference is reproduced in a series of independent studies, the greater the confidence in a given intervention.

It is also possible to falsely conclude that one intervention is not superior to another intervention. The percentage of occasions in which this happens will depend upon the size of the difference the studies are seeking to detect and the sample size used. The rate of such errors is conventionally controlled by specifying the difference that the studies are designed to detect.

This occurs at the planning stage when the number of cases needed to provide a high probability of detecting a difference of a given magnitude is estimated. Replications are needed to reduce the chance of falsely concluding that an intervention does not work.

Comparison Group and Case Control Studies

Many studies on the effectiveness of treatment for substance abuse have used random assignment. These studies are less common and more difficult to mount in the areas of prevention and harm reduction. Without random assignment, the assessment of the effectiveness of an intervention must depend on the results of observational outcome studies. In these studies, outcomes are observed among those who have been selectively exposed to different experiences rather than being randomly assigned by the researcher. There are two types of observation studies: (1) control group studies in which outcomes are compared among groups or persons who have had different experiences; and, (2) pre-post studies in which those exposed to a particular intervention are assessed before and after such exposure.

With pre-post studies, the outcomes of those with greater or lesser exposure are sometimes compared on the assumption that there is a dose-response relationship. Caution must be exercised, however, as inferences from such analyses may be of uncertain value if those with the best outcomes were initially more motivated and thus more likely to remain exposed to the intervention of interest. This can be addressed through the use of a quasi-experimental design (see below) with statistical controls for factors that influence exposure to interventions.

A time series design can be used to assess the effectiveness of some types of intervention if comparable data are available over long periods before and after the intervention (e.g. administrative statistics on DWI arrests, burglaries, over-dose deaths or drug related hospital admissions).

The major problem with control group studies is deciding, at the outset, whether those exposed to the intervention of interest differed from those in the comparison conditions. If not, then any differences in outcomes could simply reflect differences that existed from the start. One way to control for this possibility is to use a quasi-experimental design which involves taking measurements of factors that might predict a better or worse treatment outcome (e.g., level of risk, age, severity of dependence, history of previous treatment, psychological and social adjustment). Statistical methods are then used to determine whether any apparent differences in the outcomes between interventions persist after statistical adjustment. If differences do persist then one can be more confident that there is an intervention effect. The confidence in such statistical adjustments will depend upon the ability to specify and measure the factors that may explain differences in outcome.

Another was to look at the differences between the experimental group and the control group. With this approach, you match pairs of individuals who have/have not been exposed on variables that might otherwise influence outcomes (e.g. problem severity, age, psychological and social adjustment).

Economic Evaluations

Even when interventions are demonstrably effective they may not be optimally efficient or cost effective relative to other interventions nor may their benefits exceed their costs. An economic perspective is thus desirable even if two or more interventions have been shown to be more or less effective. In addition to simple cost and cost efficiency analyses, three main types of economic evaluations have been proposed and used to some extent. The first concerns the cost-effectiveness of two or more interventions and involves comparisons of outcomes of various types (e.g. days of sobriety or low risk drinking) against the costs of these interventions. The aim is to determine which intervention has the best outcomes per unit cost. A second type of economic evaluation seeks to assign discounted monetary values to outcomes of various kinds (e.g. reduced hospital stays) and to compare these with the costs of delivering the intervention of concern. These kinds of "cost-benefit" have produced results in support of treatment but have been criticized for not taking account of outcomes such as subjective well-being. A third type of economic evaluation, "cost utility analyses," was developed in response to such criticism. This uses ratings of the quality of life and life expectancy and survival of clients who have been treated as primary outcome measures. Often these ratings are used to compute a measure of "quality adjusted life years" (QALYs) that are used to indicate a degree of discrepancy between a client's actual outcome status and an ideal status from a client's own perspective.

Other Research Designs

Ecological studies compare change in populations with members who have different opportunities for exposure to specific interventions. For example, mass media campaigns or needle exchange programs. These studies can sometimes provide evidence that a community-wide intervention is/is not effective. Ecological study results need to be interpreted with caution because theses studies do not control for individual differences in levels of exposure to the intervention of interest (e.g. actual use of a needle exchange service).

Claims for the effectiveness of innovations that are not based on controlled experiments or carefully conducted comparison group studies have no inherent validity and should be viewed with considerable scepticism. This does not mean that the client testimonials or feedback from community leaders, advocacy groups or untrained observer is disregarded. On the contrary, these can provide a useful qualitative perspective on interventions of interest. They can also alert the researchers and practitioners to promising new interventions but they should not be regarded as substitutes for evaluations using scientific methods.