

## Review

## Overview of harm reduction treatments for alcohol problems

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**Abstract**

As evidenced by the tremendous range of scholarly articles included in this special issue, it is readily apparent that harm reduction is more than a theory, treatment approach, or policy. Rather, harm reduction is an orientation and belief system that has widespread empirical support as a means to improve the lives and functioning of individuals who use and abuse alcohol. In this article, we review recent empirical articles and scholarly reviews of harm reduction treatments for alcohol abuse and dependence. We focus this review on peer-reviewed articles published in the last 3 years, with a particular emphasis on interventions designed to reduce alcohol-related harm, including overall levels of consumption and alcohol-related problems. We conclude with a section on books, Web sites, and training and treatment centres devoted to harm reduction psychotherapy.

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Harm reduction remains a widely debated topic in substance use research and policy. In the treatment of alcohol dependence, the role of harm reduction approaches was made famous by the controlled-drinking controversy of the 1970s (Sobell & Sobell, 1995). As seen in the series of articles published in this special issue, the role of harm reduction in the treatment of alcohol use disorders is more than a temporary radical idea. Rather, harm reduction approaches are based on a body of extensive empirical literature supporting the pragmatism, humaneness, and effectiveness of harm reduction in the prevention and treatment of alcohol-related problems. In this article, we provide a brief review of the recent literature and a discussion of the other articles in this special issue. The current article is an extension of a previous review paper (Marlatt & Witkiewitz, 2002). Individuals who are interested in the background of harm reduction approaches and empirical support for harm reduction prior to 2002 are referred to that article and Marlatt (1998) for a more extensive discussion of the research literature.

**Recognising alcohol-related harm**

Individuals and society as a whole suffer from the many consequences of alcohol abuse and dependence. The World Health Organization (WHO) recently published the Global Status Report on Alcohol (World Health Organization [WHO], 2004), which describes international and country-specific data on the health, social, and economic costs of alcohol abuse. According to the WHO report, approximately 76.3 million people worldwide have a diagnosable alcohol use disorder. Roughly, 1–5% of the gross domestic product of individual countries is spent on treatment, prevention, research, law enforcement, and lost productivity, with these estimates not including the costs to individual alcohol users or their families (WHO, 2004).

Excessive alcohol use has many acute and prolonged health consequences and increases risk for more than 60 physical diseases (Rehm, Gmel, Sempos, & Trevisan, 2003). The WHO (2004) estimated that 9.2% of the worldwide disease burden is attributable to alcohol use. Diseases that are directly affected by excessive alcohol use include many forms of cancer, hypertension and cardiovascular disease, liver cirrhosis,

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prenatal exposure to alcohol and related conditions, digestive disorders, and psychiatric problems (Gmel & Rehm, 2003; Rehm et al., 2003b; WHO, 2004). There is also strong evidence that low to moderate doses of alcohol are related to a decreased risk of ischemic stroke, diabetes, gallstone disease, prostate cancer, and coronary heart disease (WHO, 2004). However, there is an increased risk for coronary heart disease in binge drinkers, even among individuals who are normally light-to-moderate drinkers but report heavy drinking episodes (McElduff & Dobson, 1997; Trevisan et al., 2004).

Acute alcohol intoxication is associated with severe health risks and increased risk of accidental and self-inflicted injuries (Rehm et al., 2003a). Motor vehicle accidents, falls, other injuries, interpersonal violence, and suicide are all highly related to alcohol consumption (US Department of Health and Human Services, 2000; WHO, 2004). There is also data from hospital emergency departments suggesting that any alcohol in the body at the time of an injury is associated with worse outcomes and greater severity of injury (Fuller, 1995).

### Why and how people change

In order to reduce alcohol-related harm and the disease burden associated with excessive alcohol use, researchers and clinicians need to develop a much greater understanding of why and how people change with and without treatment. Most alcohol treatment researchers and clinicians agree that treatment is effective (Miller, Walters, & Bennett, 2001). Yet, very little is known about the mechanisms by which treatment is effective (Morgenstern & Longabaugh, 2000), and even less is known about how individuals change without treatment (Matzger, Kaskutas, & Weisner, 2005; Sobell, Ellingstad, & Sobell, 2000).

Matzger et al. (2005) addressed the question of *why people change* through conducting a quantitative analysis of 'reasons for drinking less' (p. 1637) in a sample of 659 problem drinkers, including 239 adults who did not receive treatment in the past 12 months and 420 adults who received some form of public or private alcohol treatment. Problem drinking was defined as affirmative responses to two of the following: one binge episode at least once a month, alcohol-related social consequences, and one or more alcohol dependence symptoms. At 1, 3, and 5 years following a baseline interview, the respondents who indicated they were drinking 'a lot less' were provided with a list of potential reasons for why they would be drinking less. In both samples (treatment and no treatment), logistic regression analyses predicting sustained remission from problem drinking showed that the odds of remitting were highest in individuals who identified 'hitting rock bottom', traumatic events, and spiritual/religious experiences as reasons for cutting down. In the no-treatment sample, individuals who reported 'receiving a spouse's warning about their drinking' and those who reported weighing pros and cons of drinking had *lower* odds

of being non-problem drinkers at follow-up. In the treatment sample, individuals who reported receiving a warning from their doctor and weighing the pros and cons of drinking had lower odds of being in remittance. The results from Matzger et al. (2005) suggest that 'quantum changes' (Miller & C'de Baca, 2001) greatly increase the odds of an individual remitting from problem drinking, and interventions performed by family members or medical doctors are negatively related to positive outcomes. A prospective analysis using objective measures of drinking and reasons for not drinking will be needed to replicate the findings.

Witkiewitz (2005) and Witkiewitz and Masyn (2004) conducted a thorough analysis of *how people change* following treatment using latent growth mixture modelling, an analytic strategy that estimates common patterns in individual trajectories. Three hundred and ninety-five individuals were assessed monthly on measures of drinking frequency and quantity for 12 months following treatment. The results supported a model with four common drinking trajectories following an initial lapse. The most common outcome trajectory (64% of the sample) was characterised by an initial lapse followed by a return to abstinence or moderate drinking. Only 12% of the sample reported a stable heavy drinking pattern following the initial lapse. Individuals with the heaviest drinking trajectories were unique from all other drinkers in that they had significantly lower scores on measures of coping and self-efficacy and significantly higher scores on measures of negative affect and distal risks.

Interestingly, many individuals in the Witkiewitz (2005) analysis, particularly those with higher scores on measures of negative affect and distal risk, had very turbulent drinking trajectories characterised by nearly 100% abstinence in one month, followed by nearly 0% abstinence in the next month. This pattern of results and the analyses described by Matzger et al. (2005) point to a relationship between risk factors and drinking behaviour that is highly nonlinear. In the Matzger analysis, the participants identified 'hitting rock bottom', traumatic events, and quantum changes (Miller & C'de Baca, 2001) as the reasons for remittance from problem drinking. Gaining a better understanding of how and why people change their drinking will likely require idiographic and/or nonlinear dynamical analyses of individual drinking habits (Hufford, Witkiewitz, Shields, Kodya, & Caruso, 2003; Witkiewitz & Marlatt, in press).

### Getting into treatment

As alcohol treatment researchers, one of the commonly asked questions that we hear is: 'How can I help my friend who is drinking too much?' It is often believed that friends who are concerned about another friend's drinking need to get a group of loved ones together to have an 'intervention'. Johnson (1986) developed a systematic method for loved ones to intervene by encouraging entrance into treatment in a caring and supportive manner, with sanctions to the individual

for failing to do so. Unfortunately, there is very little data on the effectiveness of the Johnson approach (Miller, Meyers, & Tonigan, 1999; Moos, 2005). Of the studies that have looked at the Johnson (1986) intervention, the most common outcome was that the family and friends tend to not follow through with conducting the intervention (Miller et al., 1999). In a randomised clinical trial, Miller et al. (1999) recruited 130 individuals who were concerned about the alcohol use of a family member or friend. They randomly assigned the 'concerned significant other' to one of the three manual-guided treatments: the Johnson (1986) approach with training on how to prepare an intervention; an Al-Anon facilitation therapy designed to encourage involvement in the 12-step programme; and a community reinforcement and family training (CRAFT) approach teaching behaviour change skills to use at home. The results supported CRAFT as the most effective method for engaging unmotivated drinkers in treatment (64% of problem drinkers started treatment), as compared to Al-Anon (13% of problem drinkers started treatment), and the Johnson intervention (30% engaged in treatment).

We have heard many stories of negative outcomes from the Johnson approach executed poorly; and there is data demonstrating that anger, alienation, resentment, and resistance are commonly evoked by confrontational approaches (Fernandez, Begley, & Marlatt, *in press*; Moos, 2005). Possibly the most famous unsuccessful intervention of this type was organised by family and friends of the late musician, Kurt Cobain. In the week prior to his death, Cobain was confronted by his family and friends, including members of his band, in which he was told that he had no choice but to attend an abstinence-based rehabilitation centre in Los Angeles (US). Cobain asked if someone could 'meet him half-way', instead of insisting on his participation in a programme that required total abstinence. Perhaps, if harm-reduction were presented as an alternative to total abstinence, there would have been an effective means for Cobain to learn how to cope with alternative behaviours to his continuing use of heroin as a self-medication for his chronic stomach pains (Marlatt, 2004).

### Self-help and self-administered treatments

Alcoholics Anonymous (AA) is the most widely used self-help intervention worldwide. More than two million people belong to AA worldwide (Alcoholics Anonymous, 2006). Unfortunately, AA is not the most desired treatment for many individuals. In a recent study on treatment preferences, Dillworth (2005) found that more than 60% of individuals in a community sample stated they would prefer alternative treatments to AA and would be unlikely to attend AA, even if they had concerns about their drinking. After being given descriptions of different treatments for alcohol dependence, the majority of participants stated that they would prefer a cognitive-behavioural approach, which included descriptions of motivational interviewing, relapse prevention, and

moderation management. For example, the description of the cognitive behavioural approach stated, 'This treatment is based on the idea that problems like drinking are habits that are learned. We learn these habits over a long period of time, and they are very difficult to break. But learned habits can be unlearned. The emphasis of the treatment is on learning coping skills and to increase your ability to deal with drinking and high-risk situations that often lead to drinking' (Dillworth, 2005).

Moderation management (MM) is an alternative mutual-help group that supports, but does not require, abstinence and helps members achieve moderation goals. Survey research has shown that individuals who otherwise would not seek any alcohol treatment services are attracted to MM (Humphreys & Klaw, 2001; Kosok, 2006). In general, when provided the opportunity, many individuals choose moderation goals; and many of those who choose a moderation goal will change their goal towards abstinence (Hodgins, Leigh, Milne, & Gerrish, 1997). The individuals who self-select MM tend to drink less frequently, have fewer alcohol-related problems, and fewer symptoms of physical dependence as compared to their peers in AA (Humphreys & Klaw, 2001). As stated by Hodgins (2005), 'It appears that the right people are choosing this [MM] treatment approach' (p. 265). In the same commentary, Hodgins (2005) reminded the research community that even the *Big Book* from AA identifies certain heavy drinkers can drink moderately: 'Moderate drinkers have little trouble in giving up liquor entirely if they have good reason for it. They can take it or leave it alone. Then we have a certain type of hard drinker . . . [who] can also stop or moderate, although he may find it difficult and troublesome and may even need medical attention' (p. 39). Indeed, several studies have supported this conclusion (Cunningham, Lin, Ross, & Walsh, 2000; Hallford, Tivis, & Nixon, 2003; Sobell et al., 2000; Witkiewitz, 2004).

Since the publication of Marlatt and Witkiewitz (2002), there have been major developments in the area of Internet-based interventions for alcohol abuse and dependence. Copeland and Martin (2004) conducted a qualitative review of the empirical literature examining Web-based interventions for substance abuse. The review showed considerable promise for Internet interventions, although the authors of the review recommended a strong need for more systematic research on Web-based interventions, particularly for individuals who are alcohol-dependent (Copeland & Martin, 2004). Neighbors, Larimer, and Lewis (2004) and Walters and Neighbors (2005) have developed a computer-delivered personalised normative feedback intervention with demonstrated efficacy in the treatment of college-student drinking problems. See Neighbors, Larimer, Lostutter, and Woods (2006) for more information about the programme.

Hester, Squires, and Delaney (2005) and Hester and Delaney (1997) have developed a Windows-based intervention, called the 'Drinker's Check-Up' (modelled after the Brief Drinker's Check-up developed by Miller, Sovereign, & Krege, 1988 and Behavioral Self-Control Training). In a

randomised controlled trial, Hester et al. (2005) found that an immediate intervention group reduced their drinking significantly in the first 4 weeks following the computerised intervention, as compared to a delayed intervention group. After the initial delay of 4 weeks, both groups received treatment and had similar outcomes at 12 months following the intervention, with a 50% reduction in drinking and similar reductions in alcohol-related consequences. Kypri et al. (2004) tested the efficacy of a Web-based screening and brief intervention for problem drinking among a group of college students recruited from a primary care clinic. The Web-based programme reduced drinking and alcohol-related problems with similar efficacy as brief interventions delivered by practitioners.

### Behavioural treatment interventions with moderation goals

Two recent commentaries published in the *Canadian Journal of Psychiatry* (el-Guebaly, 2005; Hodgins, 2005) provided a description of the controlled drinking controversy (Heather & Robertson, 1983; Marlatt, 1983; Sobell & Sobell, 1995) and the state of the controlled drinking debate today. el-Guebaly (2005) acknowledged that ‘a harm reduction strategy has currently subsumed the CD movement’ (p. 268). Hodgins (2005) presented the following charge: ‘Our challenge is to allow our experiences to move us beyond the debate concerning moderation as a treatment goal to designing and implementing treatment systems that integrate diverse evidence-based interventions’ (p. 265). Both authors agreed that the alcohol treatment field needs to increase options for treatment (even if that means supporting moderation goals) and provide the opportunity for individualised treatment goals. In this section, we review treatments that are committed to a harm reduction approach and support moderation goals, when indicated (it must be noted that moderation goals are not recommended for individuals who are pregnant, nursing, or diagnosed with acute medical conditions that preclude the use of alcohol, such as liver disease).

*Behavioural self-control training (BSCT)* is the most widely studied moderate drinking intervention (Miller, 1978; Saladin & Santa Ana, 2004). BSCT is a multi-component behaviour therapy that typically includes the following components: self-monitoring of quantity, frequency, and urges to drink; functional analysis of urges and decisions to drink; specific goals for drinking; drink refusal skills; rewards and consequences for specific behaviours (‘behavioural contracts’); and relapse prevention training. Walters (2000) conducted a meta-analysis of 17 randomised controlled trials that investigated BSCT as one of the intervention conditions. The results across studies consistently identified BSCT as superior to alternative moderation-oriented interventions and no intervention. BSCT tended to be superior to abstinence-based treatments, but the differences in effect sizes were not significant. Since the publication of the Walters (2000) analysis,

several studies have been conducted to investigate ways to improve the dissemination and implementation of BSCT, as well as possible mechanisms of change in BSCT. A computerised version of BSCT—the Drinker’s Check-up, developed by Hester and Delaney (1997) and described above—is accessible, easily disseminated, and cost-effective.

To better understand how BSCT is effective and what factors may be important for improving its effectiveness, it is critical to understand the phenomenon of behavioural self-control. Muraven, Collins, and Nienhaus (2002), Muraven, Collins, Shiffman, and Paty (2005) and Muraven and Slessareva (2003) have conducted several experimental investigations of self-control, within the context of alcohol consumption. The relevant finding from this series of studies is that self-control demands (for example, not eating desserts, being patient with irritating family members) are predictive of alcohol consumption: individuals with more self-control demands tended to drink more alcohol than intended, as compared to individuals who had fewer demands for self-control. In a prospective investigation, Muraven et al. (2005) found an interaction between intentions to limit alcohol intake and other self-control demands. When individuals tried to regulate their alcohol intake, the relationship between self-control demands and alcohol consumption rates were especially strong. On days when the individual did not attempt to regulate his or her drinking, the self-control demands were less related to subsequent alcohol consumption. These findings point to a complex relationship between self-control and consumption, which may inform clinical intervention. For example, clients could be educated on the importance of self-control demands and provided relapse prevention planning specific to the issue of other self-control demands and alcohol consumption self-control.

*Moderation-oriented Cue Exposure (MOCE)* is a behavioural treatment that is based on principles of classical conditioning. The treatment includes exposure to alcohol-related cues under the assumption that these cues elicit conditioned responses that are functionally related to alcohol consumption and urges to drink (Monti et al., 1993). The goal of MOCE is to expose the client to alcohol-related cues without providing the opportunity to drink, thereby extinguishing the relationship between the cues and conditioned alcohol responding (Heather et al., 2000). Several studies have demonstrated the effectiveness of MOCE in the treatment of alcohol dependence (see Dawe, Rees, Mattick, Sitharthan, & Heather, 2002; Heather et al., 2000; Sitharthan, Sitharthan, Hough, & Kavanagh, 1997). These studies have used BSCT as a comparison group, and the results have shown no differences between MOCE and BSCT on alcohol consumption or measures of alcohol-related consequences. Unlike BSCT, the MOCE intervention may be less suited for computerised or self-administered formats, and this may hinder the dissemination and accessibility of MOCE.

*Guided Self-change (GSC)* was originally developed by Sobell et al. (1996) and Sobell and Sobell (1993) and has



received considerable empirical support over the past decade (see Saladin & Santa Ana, 2004, for a review). GSC is a brief intervention designed to help individuals identify their strengths and motivate them to recover from alcohol problems as part of a natural recovery/self-change process. Motivational strategies and psychoeducation on the unattractive aspects of drinking are commonly used strategies within a GSC programme. GSC is an attractive option because it is empowering and requires very little therapeutic contact. In one study, Andreasson, Hansagi, and Osterlund (2002) demonstrated that one-session of GSC advice was as effective as a four-session GSC intervention at reducing self-reported alcohol consumption, drinking-related consequences, and quality of life at 23 months following the interventions.

Many extensions of the GSC treatment model are conducted worldwide (Sobell & Sobell, 2005). The GSC programme has been translated into Spanish and evaluated in both Mexico (Lozano-Blanco, Sobell, & Velsaquez, 2002) and for Spanish-speaking individuals living in the US (Gil, Wagner, & Tubman, 2004). Gil et al. (2004) modified the GSC materials for African-American and Hispanic adolescents and found significant reductions in alcohol and Cannabis use in a sample of 97 adolescents. The GSC model has also been applied as a community-level intervention (Sobell et al., 1996). Sobell et al. (1996) evaluated the Promoting Self-Change project, which included 825 heavy drinkers recruited from the community via advertisements and phone interviews. Individuals were randomly assigned to receive either a brief motivational intervention with personalised feedback or educational materials that contained information about the effects of alcohol and low-risk drinking guidelines. Both groups reported significant reductions in drinking up to 1 year following the intervention. The mailed education materials developed by Sobell et al. (1996) represent a cost-effective, accessible, and non-stigmatising intervention for individuals with alcohol use disorders. Replication studies using these materials are clearly needed.

*Behavioural Couples Therapy (BCT)* as a treatment for alcohol dependence has received considerable empirical support since the publication of Marlatt and Witkiewitz (2002). BCT engages both the alcohol-dependent individual and an intimate partner in a treatment for alcohol dependence that uses a cognitive-behavioural conceptualisation of drinking as a learned behaviour and an emphasis on the social-interpersonal relationships that maintain problematic drinking behaviour (Epstein & McCrady, 1998). BCT has been delivered as a stand-alone treatment targeting drinking, coping, and relationship functioning (Epstein & McCrady, 1998) and as a secondary or follow-up treatment to individual CBT for alcohol dependence (O'Farrell & Fals-Stewart, 2000). Both approaches have been shown to improve relationship functioning and promote reductions in drinking (Longabaugh et al., 2005). In a recent study combining BCT with either AA, CBT, or relapse prevention (RP), there were no sig-

nificant differences between the three treatment conditions on drinking outcomes (McCrady, Epstein, & Kahler, 2004), and there were significant improvements in relationship satisfaction in all three conditions. BCT has also been shown to be related to reductions in domestic violence (O'Farrell & Fals-Stewart, 2000) and improvements in the psychosocial functioning of the couple's children (Kelley & Fals-Stewart, 2002). While many of these studies have focused on abstinence goals, Walitzer and Dermen (2004) tested the effectiveness of BCT in a study with drinking reduction goals. The results showed improved outcomes for individuals whose partners were involved in the treatment, with individuals assigned to either BCT or spouse-involved alcohol-focused treatment, reporting fewer heavy drinking days and more abstinent or light drinking days in the year following treatment.

*Mindfulness-based Relapse Prevention (MBRP)* incorporates cognitive-behavioural relapse prevention training (Marlatt & Gordon, 1985; Marlatt & Witkiewitz, 2005) with instruction on mindfulness skills and regular meditation practice (Witkiewitz, Marlatt, & Walker, 2005). The goal of MBRP is to help clients learn and apply mindfulness as a tool for increasing awareness of both pleasant and unpleasant sensations, thoughts, feelings, and alcohol-related cues in their environment. By implementing a regular mindfulness practice, clients learn to focus their mind and increase acceptance of psychological and physiological reactions to environmental cues. It is hypothesised that MBRP will be effective to the extent that individuals can learn non-judgmental awareness of alcohol craving and develop the capacity to stay present in the current moment. Awareness and non-reaction to several relapse risk factors (negative affective states, alcohol cues, external pressure to drink, and positive outcome expectancies) may greatly enhance an individual's self-efficacy and his or her ability to maintain abstinence or moderate drinking goals, even in the face of a high-risk situation (Witkiewitz & Marlatt, 2004).

MBRP is still being developed, and a randomised controlled trial evaluating MBRP is in the planning stages. As such, we review empirical evidence demonstrating the effectiveness of mindfulness meditation training in reducing alcohol and drug use (Bowen et al., in press; Marlatt & Kristeller, 1999; Marlatt et al., 2004; Witkiewitz et al., 2005). Bowen et al. (in press), Marlatt et al. (2004) and Witkiewitz et al. (2005) studied the effects of Vipassana meditation, a Buddhist mindfulness meditation technique, on the post-incarceration alcohol and drug use and psychosocial functioning of individuals who participated in a 10-day Vipassana meditation course during incarceration at a rehabilitation facility. As compared to a control group who received treatment as usual, the inmates who participated in Vipassana reported significantly less alcohol, Cannabis, and crack cocaine use and fewer alcohol-related problems at 3-months post-incarceration. Participants in Vipassana also reported significantly fewer psychiatric symptoms and higher

levels of optimism, as compared to the control group (Bowen et al., in press).

### Harm reduction treatment in medical settings

The American Medical Association (AMA) and American College of Surgeons (ACS) are two credentialing organisations that have provided support for comprehensive harm reduction approaches to the identification and treatment of problem drinkers within primary care (American Medical Association, 1999) and trauma centres (American College of Surgeons, 2000). Recommendations from the AMA are based on a series of randomised controlled trials demonstrating the effectiveness of brief interventions in primary care settings. Likewise, the US Preventive Services Task Force recently concluded that brief behavioural alcohol interventions delivered in primary care settings can reduce risky and harmful alcohol use (Whitlock, Polen, Green, Orleans, & Klein, 2004). In their review of 12 controlled trials, Whitlock and colleagues found that an average reduction in drinks per week (after 6–12 months follow-up) was 13–34% more than in control participants. In general, less than 10 min of structured advice about alcohol, delivered by a primary care provider, is related to significant reductions in harmful alcohol use, and these reductions are maintained up to 4 years following the brief intervention (Fleming et al., 2002).

Project Trial for Early Alcohol Treatment (TrEAT) compared a two 10–15 min brief physician-delivered advice condition with a no-advice control condition in a group of randomly assigned problem drinking adults, aged 18–64 years (Fleming, Barry, Manwell, Johnson, & London, 1997). The results demonstrated that the patients who received the physician advice indicated significant reductions in alcohol consumption (from 19 to 12 average number of drinks per week in the intervention group and 19–16 mean drinks per week in the control group), binge-drinking (on average 2 fewer episodes per month in the intervention group compared to controls), and fewer hospital stays during a 12-month follow-up period.

Recommendations from the ACS are based on the effectiveness of a screening and brief intervention programme for individuals who had a positive blood alcohol level at the time of admission to a level 1 trauma centre (Gentilello, Donovan, Dunn, & Rivara, 1995). A prospective randomised controlled trial, in which the intervention consisted of a single brief motivational intervention provided by a clinical psychologist (often a conversation of 30 min or less), resulted in a 47% decrease in re-injury rate for individuals in the intervention group (Gentilello et al., 1995). The researchers estimated that trauma centres and local/national government could save approximately US\$ 1.82 billion annually (Gentilello et al., 1995), if screening and brief interventions were provided to patients who were admitted with a positive blood alcohol level. More than cost savings, the intervention developed by Gentilello and colleagues helped individuals experience less harm.

### Pharmacological interventions

With the development of new pharmacological agents, there is increased opportunity for reducing harmful drinking and improving controlled drinking attempts. The first drug therapy to be developed for alcohol dependence was disulfiram (*Antabuse*), which prevents the metabolism of alcohol and makes the experience of drinking unpleasant due to the excess of acetaldehyde. Disulfiram is only effective to the extent that individuals are compliant with taking the medication, even when they are planning to drink. In many ways, disulfiram is an anti-harm reduction medication: the only treatment goal is abstinence, and, if individuals attempt to drink moderately (non-harmfully), they will still experience harmful consequences (alcohol poisoning). We turn our attention to pharmacotherapies that are more appropriate as harm reduction agents.

*Naltrexone*, an opioid agonist, was approved by the US Food and Drug Administration for the purpose of treating alcohol dependence in 1994. Naltrexone is thought to reduce the reinforcing effects of alcohol and, thus, reduce the behavioural response to drink greater amounts, more frequently. Several randomised controlled trials have been conducted, and naltrexone has demonstrated efficacy in comparison to placebo (see Streeton & Whelan, 2001, for review). The efficacy of naltrexone is partially determined by medication compliance (Volpicelli et al., 1997); poor compliance has been shown to greatly reduce the effectiveness of naltrexone (Bouza, Angeles, Munoz, & Amate, 2004). Consistent with a harm reduction approach, a long-acting naltrexone formulation that releases the drug for 1 month per injection was developed (Bartus et al., 2003) and tested in a multi-centre, randomised, double-blind placebo-controlled study (Garbutt et al., 2005). Compared to placebo, the long-acting naltrexone resulted in a significant decrease in heavy drinking days over 6 months. Future research comparing long-acting and daily administrations of naltrexone needs to be conducted (Mann, 2004).

*Acamprosate*, a glutamatergic modulator that depresses NMDA receptor activation, has been evaluated in 17 published, placebo-controlled studies with the majority of studies demonstrating the efficacy of acamprosate, as compared to placebo, in maintaining abstinence (Garbutt, West, Carey, Lohr, & Crews, 1999; Mann, 2004; Swift, 1999). The mechanism by which acamprosate is believed to be effective is via its effect on alcohol withdrawal, and the data consistently show acamprosate is not an effective medication for individuals with moderation goals (Sass, Soyka, Mann, & Zieglansberger, 1996). Nonetheless, we mention acamprosate here because it is a viable adjunctive treatment to naltrexone and is currently being evaluated as such in the multi-site trial, Project COMBINE (Swift & Pettinati, 2005).

*Project Combining Medications and Behavioral Interventions (COMBINE)* is a multi-site pharmacological and behavioural treatment study, sponsored by the National Institute of Alcohol Abuse and Alcoholism (NIAAA, US). COM-

BINE includes 11 research units and 1380 alcohol-dependent patients treated for 16 weeks and assessed for 1 year following treatment. The goal of COMBINE is to evaluate the efficacy of naltrexone alone, versus acamprosate alone, versus naltrexone + acamprosate in combination; each pharmacological treatment was paired with two behavioural treatments of low versus high intensity (medication management and combined behavioural intervention, respectively). Project COMBINE was designed to be abstinence-based, and moderate drinking skills were not included in the behavioural intervention skill set. However, a sample of clients in the behavioural intervention chose their own treatment aims and, therefore, had the opportunity to choose a controlled drinking treatment goal.

Several *experimental pharmacotherapies* have demonstrated efficacy in the treatment of alcohol dependence (Mann, 2004). None of these drugs have been sufficiently evaluated in a clinical trial or submitted to rigorous study, and they are not FDA approved for the treatment of alcohol dependence. Nevertheless, these pharmacotherapies are in the process of being empirically tested and are worth a brief mention. The drugs being tested in the treatment of alcohol dependence and withdrawal can be classified as acting on dopaminergic, serotonergic, GABA/glutamate, cholinergic and opioid systems, as all of these neurotransmitter systems play a role in alcohol dependence (Mann, 2004).

Mann (2004) provided an excellent overview of the clinical data on approved and experimental medications for alcohol dependence, and the interested reader is referred to that article for more information. There are a few pharmacotherapies that were not included in Mann's (2004) review, yet have been tested in placebo-controlled randomised trials with promising results. Baclofen (Lioresal) is a GABA<sub>B</sub> agonist therapy that may be a valuable medication for reducing alcohol-related harm and easing the transition from heavy to moderate drinking. Preliminary studies have demonstrated that baclofen may attenuate the positive, rewarding aspects of alcohol and reduce withdrawal symptoms (Addolorato et al., 2003), which would improve the likelihood that individuals are able to maintain drinking at a reduced dose (Flannery et al., 2004). Topiramate (Topamax) is an FDA approved medication for seizure disorders that decreases extracellular release of dopamine in the midbrain and has the potential to decrease rewarding effects of alcohol intake. In the only randomised, placebo-controlled trial, topiramate was shown to be more effective than placebo at reducing drinking and increasing percentage of abstinent days (Johnson et al., 2003).

### Harm reduction psychotherapy

Over the past 4 years, there has been a large increase in the number of resources for clinicians who are interested in practicing harm reduction psychotherapy for clients with alcohol-related problems. Marlatt (1998) edited the first harm reduction text entitled, *Harm Reduction: Prag-*

*matic Strategies for Managing High-Risk Behaviors*, which included a collection of scholarly papers on the application of harm reduction to alcohol and a variety of substance and non-substance use problems. Denning et al. have written two books devoted to harm reduction therapy. The first, *Over the Influence: The Harm Reduction Guide for Managing Drugs and Alcohol* (Denning, Little, & Glickman, 2003), is a self-help resource for individuals seeking an alternative to traditional abstinence-based treatments. The second, *Practicing Harm Reduction Psychotherapy: An Alternative Approach to Addictions* (Denning, 2004), is a resource for professionals who use harm reduction in practice. *Harm Reduction Psychotherapy: A New Treatment for Drug and Alcohol Problems* by Tatarksy (2002) provides case studies and practical information for clinicians who are working with alcohol- and drug-dependent clients and are interested in harm reduction. There has been a proliferation of harm reduction-related Web sites, organisations, and treatment centres, which all can be useful resources for clients and their families. The Harm Reduction Coalition (<http://www.harmreduction.org>) provides a comprehensive set of links to additional Web sites and resources. Other pages with useful links include a HabitSmart page on pushing harm reduction (<http://www.habitsmart.com/hrmtitle.html>) and the Stanton Peele addiction website (<http://www.peele.net/lib/smart.html>).

### Summary and conclusions

Harm reduction is no longer a minority movement and may soon be accepted as mainstream practice in the research and treatment of addictive behaviours (el-Guebaly, 2005). The empirical data and qualitative reports support the effectiveness and efficacy of harm reduction approaches to alcohol treatment and demonstrate that abstinence-only approaches may actually deter alcohol-dependent individuals from seeking treatment. AA remains the most widely available treatment worldwide, but Internet treatments and alternatives to AA are increasing in number. The greater accessibility of Web-based treatments and MM groups will help individuals with moderation goals receive needed support, without requiring abstinence.

Given that harm reduction has demonstrated efficacy and effectiveness in the treatment of addictive behaviours, the future of moderation-based treatments requires researchers to communicate these positive research findings into policy and system changes. As explicitly stated by Hodgins (2005), 'Our challenge is to allow our experiences to move us beyond the debate concerning moderation as a treatment goal (our contemplation stage) to designing and implementing treatment systems that integrate diverse evidence-based interventions (our action stage)' (p. 265). Thus far, the approach has been bottom-up, with individual researchers demonstrating that harm reduction treatments are effective at reducing alcohol problems. A top-down approach will help these findings be



disseminated to the general population. Translation research, which is currently underway and supported by public and private funding organisations (e.g., [US Department of Health and Human Services, 2005](#); see also Robert Wood Johnson Foundation at <http://www.rwjf.org/>), will help move the field in the direction of disseminating harm reduction practices and challenging the current rhetoric of abstinence-based treatments. The series of articles in this special issue demonstrate that this move is well on its way.

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