

A B S T R A C T

This study compared 18 low-risk drinking guidelines that were gathered from Canadian government agencies, non-government agencies, medical bodies, and public and private agencies involved in the treatment of addictions. The results show that two sets of guidelines are predominantly used in Ontario. The formulation of these guidelines was entirely independent and their intended audiences are also different. However, a direct comparison of the two guidelines shows that differences are more apparent than real. This study also examines the literature evaluating low-risk drinking guidelines. Very little literature exists on evaluating low-risk drinking guidelines as vehicles for primary prevention and it is not known to what extent such guidelines influence knowledge and drinking behaviour. Future low-risk drinking recommendations should be evaluated for knowledge about standard drink units, awareness of the guidelines, use of materials and aids included in the dissemination program, and changes in behaviour from campaign exposure.

A B R É G É

La présente étude comparative se penche sur 18 directives de consommation d'alcool à faible risque recueillies auprès d'organismes gouvernementaux et non-gouvernementaux canadiens, d'organismes de traitement des toxicomanies du secteur public et privé, et des corps médicaux. Les résultats montrent que l'Ontario favorise deux séries de directives. Leur formulation s'est déroulée de façon tout à fait indépendante et leur auditoire cible est également différent. Toutefois, après comparaison directe de ces deux séries de directives, on s'aperçoit que les différences ne sont apparentes qu'en surface. La présente étude se penche également sur la documentation évaluant les directives de consommation d'alcool à faible risque. Il existe très peu de documentation sur l'évaluation de ces directives comme mesure de prévention primaire. Nous ignorons également jusqu'à quel point ces directives influent sur les connaissances des buveurs et sur leurs comportements à l'égard de l'alcool. Les prochaines recommandations en matière de consommation à faible risque devraient faire l'objet d'une évaluation des connaissances des buveurs au sujet des verres standard, de leur sensibilisation à propos des directives de consommation, de l'utilisation du matériel d'accompagnement des programmes de dissémination, et des changements de comportements après exposition à une campagne de sensibilisation.

Review of Canadian Low-risk Drinking Guidelines and Their Effectiveness

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Low-risk drinking guidelines are considered an essential measure to prevent alcohol-related problems and influence alcohol policy in many countries. However, these guidelines are not always without controversy. For example, in the UK there was a recent debate between the British Medical Association (BMA) and an Intro-Departmental Working Group led by the Department of Health as to the measure of alcoholic beverage limits. BMA recommended weekly units¹ (21 units per week for men and 14 units for women) while the Intro-Departmental Working Group² chose to ignore weekly limits in favour of daily limits (between 3 and 4 drinks daily for men and between 2 and 3 drinks daily for women). Consequently, males could drink up to 28 drinks per week while females could consume 21 drinks. The Intro-Departmental Working Group felt that weekly limits failed to expose the effects of short-term drinking binges while daily limits provided the benchmarks for single drinking episodes.

Different guidelines exist not only in the UK: Canada, and individual provinces such as Ontario, have seen many guidelines in recent years. It is the aim of this paper to review the guidelines in Ontario including a review of their effectiveness.

METHOD

This review was undertaken as part of a project to formulate a standard recommendation on alcohol use and risk for Ontario. The first step was to summarize statements

about low-risk drinking and moderate drinking which have been put forward by major public health or medical bodies in Canada.

Canadian low-risk drinking guidelines were gathered from a number of health agencies, including government agencies, non-government agencies, medical bodies and medical expert panels, and public and private agencies involved in the treatment of addictions. Each agency contacted was asked if they knew of similar recommendations, resulting in a 'snowball' sample.

A total of 18 guidelines were obtained (Table I), however, a count of distinct recommendations is arbitrary. Several agencies have endorsed different guidelines at various times, while others have never produced their own guidelines but have endorsed guidelines from one or more agencies. Also, some agencies had more than one version in circulation.

Guidelines that have been widely used in Canada

One of the first explicit recommendations for low-risk drinking, 'Know Your Score', came from the Addiction Research Foundation.³ In this guide, various levels of alcohol consumption were associated with a continuum of health risk. Low-risk use was defined as up to two drinks per day (a standard drink contains approximately 13.6 grams of alcohol). Caution was extolled for those consuming between three and four drinks per day, while having five or six drinks daily was labelled hazardous. Consumption of seven or eight drinks was thought to pose a serious health risk and higher consumption, considered an 'alcoholic' level, presented extremely dangerous levels of risk and warranted professional treatment.

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TABLE I
Canadian Low-risk Drinking Guidelines

Organization	Low Risk	Hazardous	Harmful	Notes
ARF - Know The Score, 1979 ³	Men & Women: No more than 27.2 g per day. Caution advised for those consuming between 40.8-54.4 g per day.	Men & Women: Between 68.0-81.6 g per day.	Men & Women: Between 95.2-108.8 g per day.	An extremely dangerous level of risk occurs for those consuming between 122.4-136.0 g per day. No safe level of consumption for pregnant women. Binge drinking can be harmful and dangerous to health, regardless of average daily consumption.
Ontario Ministry of Health of Ontario, 1988 ⁴	Men & Women: No more than 190.4 g per week.	Men & Women: Between 190.5-462.4 g per week.	Men & Women: 462.5 g or more per week	Risk levels will vary with gender, lean body weight, and other unspecified factors. Consuming five or more drinks per occasion will increase risk of problems. Any alcohol in the bloodstream impairs the ability to drive. Consuming alcohol on three or fewer days per week has a low association with problems. Daily drinking has a significantly higher association with problems.
Canadian Liver Foundation, 1990 ²⁰	Men & Women: Less than 27.2 g on days drinking - 190.4 g per week.			The extent to which alcohol is safe depends on the individual's body weight, gender, etc. Women are more susceptible to alcohol-related liver damage. The Canadian Liver Foundation recommends that alcohol consumption be limited to less than two drinks a day.
The Royal College of Physicians and Surgeons of Canada, 1991 ³¹	Men & Women: No more than 27.2 g per day. Caution advised for those consuming between 40.8 and 54.4 g per day.	Men & Women: Between 68 and 81.6 g per day.	Men & Women: Between 95.2 and 108.8 g per day.	On average the quantity consumed by women should be reduced by one third. Proportional adjustments in quantity can be made for people who are either lighter or heavier in body weight. No safe level defined for pregnant women. Binge drinking is harmful and dangerous to health. Alcohol in conjunction with recreational activities, household activities, driving, medications, and work are risk behaviours.
Health Canada, Nutrition Programs Unit, Nutrition Recommendations 1990 ³²	Men & Women: 27.2 g per day or no more than 5% of total energy as alcohol, whichever is less.			It is prudent to abstain during pregnancy.
ARF and Homewood Health Services, 1991 ³³	Men: No more than 54.4 g on days drinking - 163.2 g per week Women: No more than 40.8 g on days drinking - 122.4 g per week.			Drinking more than 12 drinks a week for women and 16 drinks a week for men can cause problems in the long run. Daily drinking can also cause problems. One drink may be risky: before or while driving; before or while using power tools; when taking certain medicines. It's best to put off drinking when: pregnant; younger than the legal age; and when a health problem may be made worse by drinking.
Health Canada, Canada Food Guide, 1992 ³⁴	Men & Women: No more than 13.6 g per day - 95.2 g per week			No more than 7 drinks per week. More than 4 drinks on any one occasion or more than 14 drinks in a week are considered a risk to health and safety. Pregnant women are advised to avoid alcohol altogether.
Sanchez-Craig (ARF), 1993 ⁵	Men: No more than 54.4 g on days drinking - 217.6 g per week. Women: No more than 40.8 g on days drinking - 163.2 g per week.			Don't drink daily. Don't drink more than one drink per hour. Don't drink to cope with problems. Don't make alcohol an important part of your recreational activities. No drinking at all in the following situations: before driving or performing any other tasks that pose a risk to the safety of yourself or others; if you are taking medication that has a negative reaction when mixed with alcohol; if you have medical problems that are likely to get worse if you drink alcohol; if you are pregnant or breastfeeding.
City of Toronto Public Health Dept., 1993 ³⁵	Men & Women: No more than 27.2 g on days drinking - no more than 163.2 g per week.			Drink no more than 12 drinks per week. Plan some alcohol-free days each week. Abstinence promoted when: under age; driving; using machinery; swimming or boating; taking medication; pregnant or breastfeeding.

TABLE I – CONTINUED
Canadian Low-risk Drinking Guidelines

Organization	Low Risk	Hazardous	Harmful	Notes
Scarborough Health Department, 1993 ³⁶	Men: No more than 54.4 g on days drinking - No more than 163.2 g per week. Women: No more than 40.8 g on days drinking - 163.2 g per week.			Have no more than 12 drinks per week. Have no more than one drink per hour. Don't drink and drive. Don't drink alcohol when you are pregnant.
CCSA & ARF, 1994 ¹⁰	Men & Women: No more than 27.2 g on days drinking - no more than 163.2 g per week.			Lower limits are appropriate for some persons due to differences in body weight, body composition and metabolism. Drinking should be minimized when breastfeeding. Lower limits also appropriate for persons with low body weight and for inexperienced drinkers. Those who currently abstain from alcohol should not begin drinking in order to reduce their risk of problems. Those who drink less than every day should not increase their consumption to reduce their risk of health problems. All those whose drinking exceeds two drinks in any day should reduce their consumption of alcohol. To minimize any risk of dependence, there should be at least one day per week when no alcohol is consumed. All persons who consume alcohol should avoid drinking to intoxication. Pregnant women should be advised to abstain from alcohol. In certain other circumstances and for certain individuals, the use of alcoholic beverages is contraindicated, including those: with certain psychological and physical illnesses and conditions; taking certain medications and psychoactive drugs.
College of the Family Physicians of Canada, 1994 ³⁷	Men: No more than 54.4 g on days drinking - no more than 163.2 g per week. Women: No more than 40.8 g on days drinking - no more than 163.2 g per week.			Drinking more than 12 drinks a week can cause problems in the long run. Daily drinking can also cause problems. One drink may be risky: before or while driving, before or while using power tools; when taking certain medicines. It's best to put off drinking when: pregnant or breastfeeding; younger than the legal age; and when a health problem may be made worse by drinking.
AADAC, 1994 ³⁸	Men & Women: No more than 27.2 g on days drinking - 163 g per week (For small-statured women, no more than 13.6 g on days drinking and 81.6 g per week is preferable)			People exceeding two drinks a day or more than 3 or 4 drinks on any occasion should reduce their consumption. Ensure that no alcohol is consumed for one day a week to minimize the risk of dependence. Avoid drinking to intoxication. Abstinence recommended for individuals: who are pregnant; with certain psychological and physical illnesses and conditions; taking certain medications and psychoactive drugs; operating vehicles or machinery; responsible for public order or safety; legally prohibited from drinking; and unable to control their drinking.
ARF - Drugs In Ontario 1995 ³⁹	Men & Women: No more than 27.2 g on days drinking - 163.2 g per week. Caution is advised for those drinking between 40.8-54.4 g 5 days a week.	Men & Women: 68 g or more on days drinking or 40.8 g on 4 or more days per week.		

TABLE I – CONTINUED
Canadian Low-risk Drinking Guidelines

Organization	Low Risk	Hazardous	Harmful	Notes
Canadian Diabetes Association, 1995 ⁴⁰	Men & Women: No more than 27.2 g on days drinking.			Use alcohol only when diabetes is well controlled. Sip slowly and make a drink last as long as possible. Never drink on an empty stomach.
University of Toronto, Faculty of Medicine, 1995 ⁴¹	Men & Women: No more than 27.2 g on days drinking - 163.2 g per week.		More than 27.2 g on days drinking - more than 163.2 g per week.	Lower limits are appropriate for some persons due to differences in body weight, body composition and metabolism. Drinking should be minimized when breastfeeding. Lower limits also appropriate for persons with low body weight and for inexperienced drinkers. Those who currently abstain from alcohol should not begin drinking in order to reduce their risk of problems. Those who drink less than every day should not increase their consumption to reduce their risk of health problems. All those whose drinking exceeds two drinks in any day should reduce their consumption of alcohol. To minimize any risk of dependence, there should be at least one day per week when no alcohol is consumed. All persons who consume alcohol should avoid drinking to intoxication. Pregnant women should be advised to abstain from alcohol. In certain other circumstances and for certain individuals, the use of alcoholic beverages is contraindicated, including those: with certain psychological and physical illnesses and conditions; taking certain medications and psychoactive drugs.
ARF - Saying When, 1996 ⁵	Men: No more than 54.4 g on days drinking - 163.2 g per week. Women: No more than 40.8 g on days drinking - 122.4 g per week			Don't drink daily. Don't drink more than one drink per hour. Don't drink to cope with problems. Don't make alcohol an important part of your recreational activities. No drinking at all in the following situations: before driving or performing any other tasks that pose a risk to the safety of yourself or others; if you are taking medication that has a negative reaction when mixed with alcohol; if you have medical problems that are likely to get worse if you drink alcohol; if you are pregnant or breastfeeding.
Homewood Health Services, 1996	Men: No more than 54.4 g on days drinking - 163.2 g per week. Women: No more than 40.8 g on days drinking - 122.4 g per week.			Don't drink daily. Don't drink more than one drink per hour. Don't drink to cope with problems. Don't make alcohol an important part of your recreational activities. Don't drink during or before risky activities.

In 1988, the Ontario Ministry of Health also designed a risk continuum for alcohol consumption and problems.⁴ Four risk categories were defined as follows: no risk (no alcohol consumption), low risk (1 to 14 drinks per week), moderate risk (15 to 34 drinks per week), and high risk (35 drinks or more per week). Factors at the individual level which influence the risk of problems such as low bodyweight and gender were also specified. Drinking to intoxication was discouraged as was daily drinking. The following situations were also presented as risk behaviours when drinking: driving, recreational activities, household activities, work performance, pregnancy and the use of medications.

A third and popular set of guidelines, Saying When, was based on the clinical research of Martha Sanchez-Craig and colleagues.⁵ These guidelines embodied the

prevailing research findings among experienced problem drinkers.^{6,7} By studying the drinking patterns of problem drinkers before and after treatment, a general guideline emerged where problem drinking was associated with consumption exceeding 4 standard drinks on any day and 12 drinks per week. The findings suggested that earlier recommendations^{6,7} on quantity of drinks per day drinking were justifiable for males and females (4 and 3 drinks respectively). The upper limit of 12 drinks per week was also supported, but only when data from both sexes were pooled. When males and females were analyzed separately,⁸ it was found that men who remained problem-free consumed an average of 14 drinks per week (with the upper limit of the 95% confidence interval for this average being 17 drinks). Subsequently, an upper limit of 16 drinks each week for

males was recommended while the 12-drink maximum for females was maintained.

Sanchez-Craig and colleagues have since refined these guidelines⁹ to no more than 4 standard drinks on any day for men and no more than 12 drinks per week. Women should consume no more than 3 drinks on any day nor exceed 9 drinks weekly.

Another popular set of guidelines, Moderate Drinking and Health,¹⁰ was developed jointly in 1994 by the ARF and the Canadian Centre on Substance Abuse (CCSA). These guidelines were motivated by an international consensus conference on the hazards and benefits of alcohol use for health and other consequences (April 30-May 1, 1994), held by the CCSA, the ARF and the University of Toronto. Recommendations suggested that up to two drinks may be consumed on days

drinking without meaningful risk of adverse health effects, and that no more than this is required to achieve the protective haemostatic effects. Support for these guidelines is found largely in research on heart disease incidence and mortality.¹¹⁻¹⁴

Summary of comparison of Canadian low-risk drinking guidelines

A review of recent guidelines on low-risk drinking reveals a great deal of similarity among them. The most variable feature is the threshold between low-risk and increased risk in terms of the number of drinks allowed per day or week. However, most of the guidelines include all of the following elements:

- Specification of the maximum amount of alcohol consumed in one day reflecting an increased risk of acute consequences and tolerance,
- Limits on the amount of alcohol consumed over a week in recognition of potential long-term health effects,
- Warnings against consuming large amounts per occasion,
- Recommendations for one or more alcohol-free day(s) each week, and
- The identification of specific subgroups and situations in which the risks are greater, and alcohol is contraindicated.

Direct comparison of the two predominant guidelines for Ontario, the Sanchez-Craig and the CCSA/ARF guidelines, shows that differences between the two may be more apparent than real. The two sets of recommendations are not greatly dissimilar in terms of the recommendations on the amount of alcohol consumed over a week, or statements made about specific higher risk behaviours. Differences between these two recommendations may be explained by recognizing differences in their stated purposes, methods of evaluation and standards of validity.¹⁵ The Sanchez-Craig guidelines are intended to be used as an upper threshold, below which problem drinkers should strive to keep themselves. The CCSA/ARF guidelines are sometimes described as having a more broad application and focussing on primary prevention. The intention was to reflect the pattern of consumption that, if adopted in the population, would result in the maximum reduction of risk of heart

disease possible without increasing the risks of trauma or other consequences, again at the population level.

The differences in purpose and approach used in the work of Sanchez-Craig as opposed to the CCSA/ARF guidelines has been described as health recovery as opposed to harm avoidance.¹⁵ The different definitions of adverse outcomes no doubt account for the differences in exposure levels identified as low- versus high-risk, and resulting estimates of the number of people in the general population who would be considered at risk.¹⁶

Research evaluating low-risk drinking guidelines

A literature search was undertaken to identify studies evaluating low-risk drinking guidelines. The research identified in support of the guidelines falls into two areas: content validation and evaluation of their impact.

Most of the guidelines were supported exclusively by content validity. Specifically, relevant scientific evidence was reviewed to determine recommendations about alcohol use that would result in low rates of long-term health effects, acute problems including accidents and injuries, and social and economic problems. For example, the development of the CCSA/ARF guidelines followed a consensus conference and critical reviews of the literature.¹⁷ Demonstrations of this type of content validity may be found in simulation studies in which estimates are derived of population levels of morbidity or mortality when assumptions are made about changes in drinking patterns across large segments of the population.^{18,19}

There are some limitations to the literature upon which such recommendations are built. The information on risk used is derived empirically, often from multiple studies with important differences in methodology and the population studied. Overall, from this body of research it is impossible to pinpoint the exact level of intake at which risk begins to increase, and there are rarely clear thresholds for risk.^{10,20,21} For example, the available literature is not sufficiently precise that one can define the difference in risk associated with a daily limit of three drinks versus two drinks.

Some specific statements are not well supported empirically. The available epidemiologic studies are not strong in their ability to distinguish between different patterns of drinking.¹¹ For example, there is insufficient evidence to support a mandatory one day of abstinence for primary prevention (there is greater evidence in favour of this recommendation for recovery from problem drinking). Whether one day of abstinence is significantly different from two, three or four days, in terms of risk, has not been addressed empirically. Walsh and Rehm found that among people who consumed fewer than 14 drinks per week, daily drinkers were actually at lower risk of drinking problems than non-daily drinkers.²²

Martha Sanchez-Craig's guidelines are unique among those described above for several reasons. They have been designed and evaluated for use in clinical populations for people with a history of drinking problems. These evaluation studies have involved people in treatment programs who have accepted or chosen moderation over abstinence as the treatment goal. The findings need not be generalizable to the general population. Those who seek help for a problem are likely to have greater experience with and tolerance for alcohol than the population at large, and the clients who have controlled drinking as their goal may not represent other clinical populations.

Importantly, these recommendations are among very few of those reviewed which have been evaluated prospectively. The definition of risk used, however, is markedly different from that implied for other guidelines. Sanchez-Craig and colleagues evaluated different treatment conditions in relation to evidence of a return to uncontrolled drinking, abnormal liver function tests and reports of problems, all signs of acute drinking problems. In contrast, most population-based guidelines refer to increased relative risks of morbidity or mortality over many years, empirically defined in large cohort studies.

Overall there is very little research literature evaluating low-risk drinking guidelines as a vehicle for primary prevention. It is not known to what degree these recommendations (and accompanying dissemina-

tion programs) influence knowledge as well as actual drinking behaviour. Two fundamental questions need to be answered: 1) does the target audience hear and correctly interpret the recommendations? and 2) when heard and understood, do people adopt the behaviour?

With respect to the first question, there are some unresolved issues around how the public understands drinking guidelines. There has been some discussion internationally about the disadvantages, even hazards, of using low-risk guidelines for prevention of alcohol problems.²³ Concern has been expressed that such guidelines may fail to reflect individual differences in health risk and social or environmental aspects of drinking problems. Also guidelines acknowledging a potential health benefit may be interpreted as recommendations for a minimum intake for good health, or will be used as a way to rationalize continued destructive drinking.^{23,24}

Another source of concern is the value of reporting guidelines in standard drink units. Several researchers have found that people cannot accurately estimate alcohol content and standard serving sizes.²⁵⁻²⁷ Similarly, there have been many studies of the validity of self-reports of alcohol consumption, most of which show that people underestimate their intake. It is unclear what effect this has on the interpretation of guidelines.

Because of this concern about interpretation of limits, a Danish national prevention campaign in 1995²⁸ also included a provision to place standard drinks labels on alcoholic beverages. There have been very small increases in knowledge about unit measures in the Danish public during two years of the national campaign.

Recommendations for future research

Sufficient scientific information already exists to speak about levels of drinking that would afford a health benefit, where applicable, as well as a low-risk of acute consequences or impairment of social function. Future research in this area is unlikely to specify with great accuracy the thresholds at which risk for various adverse effects increase. In other words, future research is not going to make it clear that 10 grams of alcohol per day are meaningfully different from 12 or 14 grams.

Low-risk drinking guidelines designed for use in primary prevention have not been evaluated in terms of their influence on attitudes or behaviour. Evaluation should begin at the development stage using methods quite removed from mainstream epidemiologic research. Focus group testing and other marketing techniques should be used to develop effective messages and program 'packaging'.

Specifically, it is the ability of the message to inform, convince and influence behaviour that needs to be studied. It is recommended that newly drafted guidelines have a detailed evaluation component to assess the following:

- Elements of the message such as the amounts recommended on a daily and weekly basis, the number of days of abstinence recommended and notices of higher risk drinking. Also, the use of a single recommendation of low and higher risk as opposed to a continuum of risk should be studied;
- The level of detail and complexity of information provided and efforts to make the message relevant to the individual;
- The credibility of the source of the information;²⁹
- Effectiveness of instructional elements, such as estimating alcohol content of servings; and
- Media used and design details.

Furthermore, guideline messages and dissemination programs should be evaluated for a variety of audiences, and purposes, such as whether the information is unsolicited or sought out about a suspected alcohol problem. Characteristics of populations at risk should also be addressed, such as risk of different types of problems (e.g., younger people are more at risk for trauma than health problems and this may influence what they take away from a message on low-risk drinking), and important sociodemographic variables such as gender or literacy levels.

Finally, evaluation of low-risk drinking guidelines would best be accomplished using a comprehensive plan to track and assess the impact of the guidelines. In this respect, the Danish experience should be used as a model.²⁸ Baseline and change information should be obtained as to

knowledge of standard drink units; awareness of the guidelines; use of materials and aids included in the dissemination program; and changes in personal behaviour as a result of exposure to the campaign.

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