

Alcohol and Primary Health Care

**Clinical Guidelines on
Identification and Brief
Interventions**

This document has been prepared by Peter Anderson, Antoni Gual and Joan Colom on behalf of the "Primary Health Care European Project on Alcohol" (PHEPA) network and is a result of the PHEPA project.

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Summary

Introduction

The European Union is the region of the world with the highest proportion of drinkers and with the highest levels of alcohol consumption per population. Alcohol is the third most important risk factor for ill-health and premature death after smoking and raised blood pressure, being more important than high cholesterol levels and overweight. Apart from being a drug of dependence and besides the 60 or so different types of disease and injury it causes, alcohol is responsible for widespread social, mental and emotional harms, including crime and family violence, leading to enormous costs to society. Alcohol not only harms the user, but those surrounding the user, including the unborn child, children, family members, and the sufferers of crime, violence and drink driving accidents.

Primary care health providers have been charged with the responsibility of identifying and intervening with patients whose drinking is hazardous or harmful to their health. Identification and brief intervention for alcohol consumption among patients in primary health care provides an opportunity to educate patients about the risks of hazardous and harmful alcohol use. Information about the amount and frequency of alcohol consumption may inform the diagnosis of the patient's presenting condition, and it may alert clinicians to the need to advise patients whose alcohol consumption might adversely affect their use of medications and other aspects of their treatment. Of utmost importance for screening and brief intervention programmes is the fact that people who are not dependent on alcohol find it easier to reduce or stop their alcohol consumption, with appropriate assistance and effort, than those who are dependent.

However, primary care health workers often find it difficult to identify and advise patients in relation to alcohol use. Among the reasons most often cited are lack of time, inadequate training, concern about antagonizing patients, the perceived incompatibility of alcohol brief intervention with primary health care, and the belief that those who are dependent on alcohol do not respond to interventions.

Preparing the guidelines

The aim of these guidelines is to summarize the evidence of the harm done by alcohol and how to manage hazardous and harmful alcohol use in primary care. The guidelines also describe alcohol dependence and how it can be managed, so primary health care providers know what to expect when more difficult to manage patients are referred for specialist help.

The primary aim of the guidelines is to advise primary health care providers on the current knowledge about the effectiveness of various techniques for assisting people who consume alcohol in a hazardous or harmful way. The guidelines are based on reviews of the evidence, and upon the experience of a task force created to draw up the guidelines. The guidelines rely, where possible, on evidence from well-designed research studies. Where this evidence is not available, recommendations are based upon appropriate clinical experience.

Summary

Describing alcohol consumption and alcohol related harm

Alcohol consumption can be described in terms of grams of alcohol consumed or in terms of standard drinks, where, in Europe, a standard drink commonly contains 10g of alcohol.

Hazardous alcohol consumption is a level of consumption or pattern of drinking that is likely to result in harm should present drinking habits persist, a working definition of the World Health Organization describes it as a regular average consumption of 20g-40g of alcohol a day for women and 40g-60g a day for men. Harmful drinking is defined as 'a pattern of drinking that causes damage to health, either physical or mental'; a working definition of the World Health Organization describes it as a regular average consumption of more than 40g alcohol a day for women and more than 60g a day for men. Heavy episodic drinking (sometimes called binge drinking), which can be particularly damaging to some forms of ill-health, can be defined as a consumption of at least 60g of alcohol on one drinking occasion. Alcohol dependence is a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on a much higher priority for a given individual than other behaviours that once had greater value.

Genes play a role in the risk of harmful alcohol use and alcohol dependence, with some genes increasing the risk and other genes decreasing the risk. There is an interaction between genes and the environment, and people who drink more alcohol or who live in an environment in which more alcohol is drunk are those who are at increased risk of alcohol-related ill health. At any given level of alcohol consumption, women appear to be at increased risk, with differing sizes of risk with different illnesses. This is probably due to the fact that women have a lower amount of body water per weight than do men. Up to one quarter of the increased risk of death in middle aged men in lower socio-economic groups than in higher socio-economic groups may be due to alcohol.

Alcohol consumption, alcohol-related harm and alcohol dependence exist within a continuum. They are not fixed entities and individuals can move back and forth along the continuum during their lives.

Alcohol and health

Alcohol increases the risk of a wide range of social harms in a dose dependent manner, with no evidence for a threshold effect. For the individual drinker, the higher the alcohol consumption, the greater the risk. Harms done by someone else's drinking range from social nuisances such as being kept awake at night through more serious consequences such as marital harm, child abuse, crime, violence and ultimately, homicide. Generally the more serious the crime or injury, the more likely alcohol is to be involved. Harm to others is a powerful reason to intervene for hazardous and harmful alcohol consumption.

Alcohol is a cause of injuries, mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular diseases, immunological disorders, skeletal diseases, reproductive disorders and pre-natal harm. Alcohol increases the risk of these diseases and injuries in a dose dependent manner, with no evidence for a threshold effect. The higher the alcohol consumption, the greater is the risk.

A small dose of alcohol consumption reduces the risk of heart disease, although the exact size of the reduction in risk and the level of alcohol consumption at which the greatest reduction occurs are still debated. Better quality studies and those that account for possible influencing factors find less of a risk and at a lower level of alcohol consumption. Most of the reduction in risk can be achieved by an average of 10g of alcohol every other day. Beyond 20g of alcohol a day the risk of coronary heart disease increases. It appears to be alcohol that reduces the risk of heart disease rather than any specific beverage type. Drinking larger amounts of alcohol on one occasion increase the risk of cardiac arrhythmias and sudden coronary death.

The risk of death from alcohol is a balance between the risk of diseases and injuries that alcohol increases and the risk of heart disease that in small amounts alcohol decreases. This balance shows that, except for older people, the consumption of alcohol is not risk free. The level of alcohol consumption with the lowest risk of death is zero or near zero for women under the age of 65, and less than 5g of alcohol a day for women aged 65 years or older. For men, the level of alcohol consumption with the lowest risk of death is zero under 35 years of age, about 5g a day in middle age, and less than 10g a day when aged 65 years or older.

There are health benefits from reducing or stopping alcohol consumption. All acute risks can be completely reversed if alcohol is removed. Even amongst chronic diseases, such as liver cirrhosis and depression, reducing or stopping alcohol consumption are associated with rapid improvements in health.

Thus, as alcohol is implicated in a very wide variety of physical and mental health problems in a dose dependent manner, there is an opportunity for primary health care providers to identify those adult patients with hazardous and harmful alcohol consumption. Further, since primary health care involves the treatment of many common physical and mental conditions, their causes in the use of alcohol need to be addressed and managed. It is of particular importance to reduce the risk of harm to others.

Identifying hazardous and harmful alcohol use

A truly preventive approach can only be reached if all adult patients are screened for hazardous and harmful alcohol consumption, including patterns of episodic heavy drinking. If such an approach is not feasible, limiting screening to high risk groups or to some specific situations may be a feasible option. Such groups could include young to middle aged males. There is no evidence to determine

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how frequent the measurement of hazardous and harmful alcohol consumption should be undertaken, but, unless there is a clinical reason, it probably should not be more often than once every four years.

The simplest questions to use are those that ask about alcohol consumption. The first three questions of the World Health Organization's Alcohol Use Disorders Identification Test (AUDIT-C), which was designed to identify hazardous and harmful alcohol consumption in primary care settings, have been well tested and validated. The first question asks about frequency of drinking; the second the amount of alcohol consumed on an average drinking day; and the third the frequency of episodic heavy drinking. The identification of hazardous and harmful alcohol consumption works best when it is incorporated into routine clinical practices and systems, such as systematically asking all new patients when they register; all patients when they attend for a health check; or all men aged 18-44 years, when they attend for a consultation. There is no evidence available to suggest that systematic identification of hazardous and harmful alcohol consumption lead to adverse effects, such as discomfort or dissatisfaction amongst patients.

Male patients who score 5 or more with the AUDIT-C, or whose alcohol consumption is 210g of alcohol or more per week and female patients who score 4 or more with the AUDIT-C, or whose alcohol consumption is 140g of alcohol or more per week should be invited to complete the full ten item AUDIT for a fuller assessment.

Biochemical tests for alcohol use disorders include liver enzymes [e.g. serum γ -glutamyl transferase (GGT) and the aminotransferases], carbohydrate deficient transferrin (CDT) and mean corpuscular volume (MCV). They are not useful for screening because elevated results have poor sensitivity, identifying only a small proportion of patients with hazardous or harmful alcohol consumption.

Effectiveness of brief interventions

The evidence would suggest that primary health care professionals should offer brief advice to male patients who score 8-15 with the AUDIT, or whose alcohol consumption is 280g of alcohol or more per week and female patients who score 8-15 with the AUDIT or whose alcohol consumption is 140g of alcohol or more per week. These cut off points should be adjusted depending on country specific evaluations and guidelines. An AUDIT score between 8 and 15 generally indicates hazardous drinking, although it may include patients experiencing harm and dependence. The framework for the brief advice can include: **Giving Feedback** that the patient's drinking falls into the hazardous drinking category, **Providing Information** on the specific risks of continued drinking at hazardous levels, **Enabling a goal to be established** by the patient to change drinking behaviour, **Giving Advice on Limits** to below 280g of alcohol or more per week for men and to below 140g of alcohol or more per week for women, and **Providing Encouragement** that hazardous drinkers are not dependent on alcohol and can change their drinking behaviour.

Brief counselling should be offered to male patients who score 16-19 with the AUDIT, or whose alcohol consumption is 350g of alcohol or more per week and female patients who score 16-19 with the AUDIT or whose alcohol consumption is 210g of alcohol or more per week. These cut off points should be adjusted depending on country specific evaluations and guidelines. Even though some patients with an AUDIT score of between 16 and 19 may fulfil the criteria of alcohol dependence, they can benefit from brief counselling. The framework for the brief counselling can include: **Giving Brief Advice** based on the above, **Assessing and Tailoring Advice to Stage of Change** recognizing that if the patient is at the pre-contemplation stage, then the advice session should focus more on feedback in order to motivate the patient to take action; if the patient has been thinking about taking action (contemplation stage), emphasis should be placed on the benefits of doing so, the risks of delaying, and how to take the first steps; if the patient is already prepared for taking action, then the emphasis should be on setting goals and securing a commitment from the patient to cut down on alcohol consumption, and providing **Follow-up** whereby maintenance strategies of providing support, feedback, and assistance in setting, achieving, and maintaining realistic goals are built into the counselling from the beginning, noting that if the patient continues for several months to have difficulties reaching and maintaining the drinking goal, consideration should be given to moving the patient to the next highest level of intervention, referral to extended treatment if it is available.

Brief interventions are effective in primary health care settings in reducing alcohol related problems amongst persons with harmful alcohol consumption, but without alcohol dependence. Eight patients need to be advised for one to benefit. There is little evidence for a dose response effect and it does not seem that extended interventions are any more effective than brief interventions. The effectiveness is certainly maintained for up to one year and maybe be maintained for up to four years.

Brief interventions appear to be to equally effective for men and women, and for young and old. They appear to be more effective for less serious problems. The evidence to date suggests that interventions during pregnancy are of limited effectiveness.

There is no evidence available to suggest that interventions lead to adverse effects, such as discomfort or dissatisfaction amongst patients.

Costs and cost effectiveness of brief interventions

It has been estimated that for every 1,000 patients cared for by a general practitioner, it would cost €1644 a year on average throughout the European Union to set up and maintain an identification and brief intervention programme. It has also been estimated that at a cost of €1960 per year of ill-health and premature death prevented, primary health care brief interventions for hazardous and harmful alcohol consumption are amongst the cheapest of all medical interventions that lead to health gain. In other words, if a primary health care

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provider is going to undertake a new activity, giving brief advice to patients with hazardous and harmful alcohol consumption will give one of the best health benefits for the practice population than spending ten minutes doing almost anything else.

Implementing identification and brief intervention programmes

Support is a pre-requisite for primary health care providers' involvement in alcohol problems, in the event of encountering difficulties and to generally ensure continuing professional development. General practitioners who work in a supportive work environment feel more positive about working with alcohol problems and manage a greater number of patients.

Providing training and giving practice based support works, with even limited support of one practice visit and ongoing telephone advice increasing identification and counselling rates of primary health care providers by nearly one half, whereas the simple provision of guidelines is likely to have little effect. Providing training and giving office based support materials appear equally effective, but providing both is more effective than either alone. It does not necessarily seem that more intensive support is better than less intensive support.

Unless the support is geared to the needs and attitudes of the general practitioners, it will not work and over the long term it may even have a detrimental effect. To increase the experience and effectiveness of general practitioners in working with alcohol-problems, both education and training and providing a supportive working environment to improve confidence and commitment are required. The provision of specialist help might increase the activity of primary and secondary health care providers, since, if difficulties arise, support from and referral to specialist help can be obtained.

In view of their effectiveness and cost effectiveness, financiers of health services should provide funding for primary health care based identification and brief intervention programmes to reduce hazardous and harmful alcohol consumption. It has been estimated that brief physician advice with 25% coverage would save 91 years of ill-health and premature death per 100,000 population, 9% of all ill-health and premature death caused by alcohol in the European Union. The PHEPA project has developed a tool to assess the adequacy of services for hazardous and harmful alcohol consumption in primary care settings.

Assessing the harm done by alcohol and alcohol dependence

Patients with hazardous and harmful alcohol consumption and those with a clinical suspicion of harmful alcohol consumption or alcohol dependence can benefit from further assessment. A first line tool is the World Health Organization's ten item Alcohol Use Disorders Identification Test. AUDIT scores of 20 or more are indicative of alcohol dependence although this can occur with lower scores and patients may require referral to a specialist for diagnostic evaluation and treatment. Alcohol dependence can be measured with the alcohol dependence module of the World Health Organization's

Composite International Diagnostic Interview (CIDI). This contains seven questions to measure alcohol dependence, with a positive answer to four or more being diagnostic. Elevated levels of serum GGT and the aminotransferases, CDT and MCV are often due to alcohol. Since these tests are performed routinely as part of a biochemical test battery, the presence of an elevated level should alert the clinician to a possible diagnosis of harmful alcohol consumption and alcohol dependence.

Managing withdrawal symptoms

People who are physically dependent upon alcohol are likely to experience withdrawal symptoms 6 to 24 hours after the last drink is consumed. Diazepam is recommended as the first-line treatment for withdrawal because of its relatively long half-life and evidence for effectiveness. The standard therapeutic regimen involves regular doses of diazepam over two to six days, not continuing past day six, to avoid the risk of dependence.

Managing alcohol dependence

Some people with alcohol dependence get better by themselves, and not everyone with alcohol dependence requires specialist treatment, although many do. People with alcohol dependence can be managed in primary health care if they agree to abstain even if they think that they are not dependent on alcohol; they refuse to be referred to a specialized centre; and they have no severe psychiatric, social or medical complications. People with alcohol dependence should be referred for specialist treatment when there have been previous unsuccessful treatment attempts; when there are severe complications or risk of moderate to severe withdrawal symptoms; when there is serious medical illness or psychiatric co morbidity; and when treatment cannot be managed by the primary care team.

Specialist treatments include behavioural approaches and pharmacotherapy. Social skills training, the community reinforcement approach, and behavioural marital therapy are among the most effective approaches, particularly when they emphasize the person's ability to stop or reduce drinking through learning self management skills, and motivational enhancement, and through strengthening the person's support system. Acamprosate and the opiate antagonist naltrexone are also effective. Methods that lack effectiveness include those designed to educate, confront, shock or foster insight regarding the nature and causes of alcohol dependence, as well as mandatory attendance to Alcoholics Anonymous. There is little evidence to suggest that the overall outcomes of treatment can be improved when patients are matched to different types of treatment.

The best model for the relationship between primary care and specialist services is not clear, although it seems that integrated primary care and specialist treatment gives a better outcome than when the two services are separated. Follow-up may reduce the risk of relapse, so it is important for primary health care providers to maintain contact over the long term with patients treated for alcohol dependence who are no longer in contact with specialist services.

1. Introduction

The European Union is the region of the world with the highest proportion of drinkers and with the highest levels of alcohol consumption per population (Anderson et al. 2005). Alcohol is the third most important risk factor for ill-health and premature death after smoking and raised blood pressure, being more important than high cholesterol levels and overweight, three times more important than diabetes and five times more important than asthma (World Health Organization 2002). Alcohol is a cause of 1 in 14 of all ill-health and premature death facing the European Union (Anderson et al 2005). Apart from being a drug of dependence and besides the 60 or so different types of disease and injury it causes, alcohol is responsible for widespread social, mental and emotional harms, including crime and family violence, costing the European Union some €124bn in tangible costs each year (Baumberg & Anderson 2005). Alcohol not only harms the user, but those surrounding the user, including the unborn child, children, family members, and the sufferers of crime, violence and drink driving accidents.

Some 55 million adult Europeans – 15% of the adult population – drink at least at hazardous alcohol consumption levels (defined as a regular average consumption of 20g-40g of alcohol a day for women and 40g-60g a day for men) with a case fatality rate of 3.5 – 4.8 per thousand women and 3.7 – 8.1 per thousand men (Chisholm et al. 2004) . Some 20 million of these, representing 6% of the adult population of the EU, drink at harmful alcohol consumption levels (defined as a regular average consumption of more than 40g alcohol a day for women and more than 60g a day for men). Overall, the average European frequency of drinking of episodic heavy drinking (sometimes called binge-drinking) is about 1½ times per month, which represents 10-60% of drinking occasions for men and about half that for women (Anderson et al. 2005). Some 118m Europeans “binge-drink” at least once a month, representing just less than 1 in 3 of the adult population. Five per cent of adult men and 1% of adult women are dependent on alcohol, that is, 23 million people are addicted to alcohol in any one year (Anderson et al. 2005).

Primary care health providers have been charged with the responsibility of identifying and intervening with patients whose drinking is hazardous or harmful to their health (Babor & Higgins-Biddle 2001). Screening and brief intervention for alcohol consumption among patients in primary health care provides an opportunity to educate patients about the risks of hazardous and harmful alcohol use. Information about the amount and frequency of alcohol consumption may inform the diagnosis of the patient’s presenting condition, and it may alert clinicians to the need to advise patients whose alcohol consumption might adversely affect their use of medications and other aspects of their treatment. Of utmost importance for screening and brief intervention programmes is the fact that people who are not dependent on alcohol find it easier to reduce or stop their alcohol consumption, with appropriate assistance and effort, than those who are dependent.

However, many primary care health workers find it difficult to screen and advise patients in relation to alcohol use. Among the reasons most often cited are lack of time, inadequate training, fear of antagonizing patients, the perceived incompatibility of alcohol brief intervention with primary health care (Beich et al. 2002), and the belief that those who are dependent on alcohol do not respond to interventions (Roche & Richard 1991; Roche et al. 1991; Roche et al. 1996; Richmond & Mendelsohn 1998; McAvoy et al. 1999; Kaner et al. 1999; Cornuz et al. 2000; Aalto et al. 2001; Kaariainen et al. 2001).

The aim of these guidelines is to summarize the evidence of the harm done by alcohol and how to undertake identification and brief interventions for hazardous and harmful alcohol use in primary care. The guidelines are not a manual for the treatment of alcohol dependence. However, they briefly describe alcohol dependence and how it can be managed, so primary health care providers know what to expect when more difficult to manage patients are referred for specialist help.

Brief interventions for hazardous and harmful alcohol consumption are highly effective and cost-effective. Were they to be implemented widely throughout Europe, reaching at least one quarter of those adults with hazardous and harmful alcohol consumption, at a relatively cheap overall cost of €740 million to the European Union as a whole, some nine per cent of the total ill-health and premature death caused by alcohol to the Union could be prevented (Anderson et al. 2005).

The guidelines are prepared at a European level, as part of the PHEPA (Primary Health Care European Project on Alcohol), involving 17 European countries co-financed by the European Commission and co-ordinated and managed by the Ministry of Health of Catalonia. The guidelines serve as a framework for country and regional specific policies and guidelines on how to identify and reduce hazardous and harmful alcohol consumption in primary care.

A guidance note for practitioners on undertaking identification and brief interventions for hazardous and harmful alcohol, based on the WHO manual brief intervention for hazardous and harmful drinking (Babor & Higgins-Biddle 2001) is presented in annexe 1.

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2. Methods to prepare the guidelines

The primary aim of the guidelines is to advise primary health care providers on the current knowledge about the effectiveness of various techniques for assisting people who consume alcohol in a hazardous or harmful way. The guidelines are based on a review of the evidence, and upon the experience of a task force created to draw up the guidelines. The guidelines rely, where possible, on evidence from well-designed research studies. Where this evidence was not available, recommendations are based upon appropriate clinical experience. The evidence is summarized in each chapter. The intention is to provide evidence that guides rather than dictates interventions, education and professional development. The guidelines are not intended to replace existing country based guidelines; rather, they aim to stimulate the development and implementation of guidelines in all countries.

Purpose of the guidelines The primary aim of the current guidelines is to provide up-to-date, evidence-based information for primary health care providers on the why and how of identifying and intervening for people with hazardous and harmful alcohol consumption. This information is required because of the size and importance of the health burden created by alcohol, and the variations in practice, and often lack of practice across Europe, for helping patients with hazardous and harmful alcohol consumption.

Audience for the guidelines The guidelines are intended for both primary health care providers (physicians and nurses) who help patients with hazardous and harmful alcohol consumption and for the managers, educators, financiers and evaluators of primary health care services who wish to know the why and how of an effective intervention.

Development of the guidelines The guidelines are based on a review of the available evidence of harm and efficacy and the knowledge of a task force created by the PHEPA project to develop the guidelines. Identifying research involved searching relevant databases for published meta-analyses and reviews, hand searching relevant journals, searching website bibliographies, and contact with major research individuals and centres for other relevant information and guidelines. Databases searched included Medline, Psycinfo, and the Cochrane Database of Systematic Reviews. We relied heavily on publications and reviews of the European Commission, the World Health Organization, and the National Institute on Alcohol Abuse and Alcoholism of the United States (for references, see individual chapters).

Levels of evidence and strength of recommendations Organizations that prepare guidelines classify the quality of the evidence available and the strength of the ensuing recommendations. Each organization uses a slightly different system and there is currently no universally agreed system.

2. Methods to prepare the guidelines

Although the preferred level of evidence comes from systematic reviews and meta-analyses¹ of epidemiological studies and randomized controlled trials, these are not available for all topics of interest. Where systematic reviews and meta-analyses are not available, authors of guidelines opt for randomized controlled trials as the next level of evidence². Controlled trials allow the researcher to conclude with a degree of certainty whether or not the treatment being tested is more effective than no treatment. Where randomized controlled trials are not available, authors opt for comparative studies, non-analytical studies and expert opinion in decreasing order. Since the PHEPA project is not constituted as a formal guideline development group, we have decided not to grade the strength of our recommendations as other guideline authors have done, but rather to make recommendations that are consistent with other publications, based on the expert opinion of the members of the PHEPA project as a whole. The whole process was checked and found consistent with the AGREE (Appraisal of Guidelines for Research and Evaluation) instrument (AGREE Collaboration 2001).

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AGREE Collaboration (2001) Appraisal of Guidelines for Research & Evaluation (AGREE) Instrument. Available from: <http://www.agreecollaboration.org>.

¹ Meta analysis is a statistical technique which combines a number of single studies or trials to increase the overall power and certainty of outcomes.

² A randomized controlled trial refers to a study that has at least one treatment group and a control group, usually placebo or no treatment. The study uses outcome measures before and after treatment, and randomly assigns participants to the groups. Some trials also use a double blind where neither the participants nor the researcher know who is receiving which intervention, or a single blind design where either the participants or the researcher does not know who is receiving which intervention.

3. Describing alcohol consumption and alcohol related harm

Summary of chapter evidence

1. How should alcohol consumption be described?

Alcohol consumption can be described in terms of grams of alcohol consumed or in terms of standard drinks, where, in Europe, a standard drink commonly contains 10g of alcohol.

2. How can hazardous and harmful drinking and dependence on alcohol be described?

Hazardous alcohol consumption is a level of consumption or pattern of drinking that is likely to result in harm should present drinking habits persist; a working definition of the World Health Organization describes it as a regular average consumption of 20g-40g of alcohol a day for women and 40g-60g a day for men. Harmful drinking is defined as 'a pattern of drinking that causes damage to health, either physical or mental'; a working definition of the World Health Organization describes it as a regular average consumption of more than 40g alcohol a day for women and more than 60g a day for men. Heavy episodic drinking (sometimes called binge drinking), which can be particularly damaging to some forms of ill-health, can be defined as a consumption of at least 60g of alcohol on one drinking occasion. Alcohol dependence is a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on a much higher priority for a given individual than other behaviours that once had greater value.

3. Do hazardous and harmful drinking and dependence on alcohol exist within a continuum?

Alcohol consumption, alcohol-related harm and alcohol dependence exist within a continuum. They are not fixed entities and individuals can move back and forth along the continuum during their lives.

Recommendations

1. At the scientific level, grams of alcohol are the preferred notation. At the primary health care level, standard drinks are the preferred notation.
2. The preferred terms to describe hazardous and harmful drinking patterns are hazardous alcohol consumption, harmful alcohol consumption, episodic heavy drinking and alcohol dependence, rather than terms such as alcohol abuse, alcohol misuse, and alcoholism.

3. Describing alcohol consumption and alcohol related harm

3.1. How should alcohol consumption be described?

Primary health care providers can describe the alcohol consumption of their patients either in terms of grams of alcohol consumed or in terms of standard drinks, where one standard drink in Europe commonly contains about 10g of absolute alcohol (Turner 1990).

At a scientific level, reports of quantities of alcohol consumed should be expressed in grams of absolute alcohol, in order to facilitate international comparability.

The term standard drink is used to simplify the measurement of alcohol consumption. Although some inaccuracy must be expected, its level of accuracy is good enough to recommend it as a method of recording alcohol consumption in a variety of settings like primary health care, accident and emergency departments and hospital in-patients.

Even though using the term standard drink has advantages, there are also difficulties:

- The alcohol contents of drinks ranges enormously, from 1% to over 45%, which may easily lead to miscalculations;
- The same kind of drink may be placed in many different types of containers, with different amounts of alcohol;
- The same type of drink may differ in alcohol concentration, depending on where and how it is produced;
- Standard drinks vary from country to country; and
- In most countries the alcohol content of a standard drink has been reached through consensus, without previous scientific research.

The use of standard drinks simplifies the assessment of alcohol consumption, and its systematic use in primary health care settings can be adopted. However, since there are country differences, the alcohol content of standard drinks should be defined in each country according to scientific research, and not only through consensus.

The World Health Organization (Babor & Higgins-Biddle 2001) proposed that a standard drink is the equivalent of:

- 330 ml of beer at 5% strength
- 140 ml of wine at 12% strength
- 90 ml of fortified wine (e.g. sherry) at 18% strength
- 70 ml of a liqueur of aperitif at 25% strength
- 40 ml of spirits at 40% strength

3. Describing alcohol consumption and alcohol related harm

Due to its specific gravity, one ml of alcohol contains 0.785g of alcohol, so the WHO definition of a standard drink is about 13g of alcohol. In Europe, standard drinks commonly contain about 10g of alcohol (Turner 1990).

3.2. How can hazardous and harmful drinking and dependence on alcohol be described?

Hazardous alcohol consumption

Hazardous alcohol consumption has been defined as a level of consumption or pattern of drinking that is likely to result in harm should present drinking habits persist (Babor et al. 1994). There is no standardized agreement for the level of alcohol consumption that should be taken for hazardous drinking, and, as shown for many conditions in Chapter 4, any level of alcohol consumption can carry risk. A working definition of the World Health Organization describes it as a regular average consumption of 20g-40g of alcohol a day for women and 40g-60g a day for men (Rehm et al. 2004).

Harmful drinking

Harmful drinking is defined as 'a pattern of drinking that causes damage to health, either physical (such as liver cirrhosis) or mental (such as depression secondary to alcohol consumption)' (World Health Organization 1992). Based on the epidemiological data relating alcohol consumption to harm (see Chapter 4), the World Health Organization has adopted a working definition of harmful alcohol consumption as a regular average consumption of more than 40g alcohol a day for women and more than 60g a day for men (Rehm et al 2004).

Intoxication

Intoxication can be defined as a more or less short-term state of functional impairment in psychological and psychomotor performance induced by the presence of alcohol in the body (World Health Organization 1992), even at very low consumption levels (Eckardt et al 1998). Intoxication is not synonymous with 'binge drinking' or 'episodic heavy drinking'.

Episodic heavy drinking

A drinking occasion that includes consumption of at least 60g of alcohol can be defined as episodic heavy drinking (World Health Organization 2004). In common terms this is frequently called 'binge drinking'.

Alcohol dependence

The World Health Organization's International Classification of Mental and Behavioural Disorders (1992), ICD-10, defines alcohol dependence as a cluster of physiological, behavioural, and cognitive phenomena in which the use of alcohol takes on a much higher priority for a given individual than other behaviours that once had greater value. A central characteristic is the desire (often strong, sometimes perceived as overpowering) to drink alcohol. Return to drinking after a period of abstinence is often associated with rapid reappearance of the features of the syndrome. The features are described in Table 3.1.

3. Describing alcohol consumption and alcohol related harm

Table 3.1 ICD 10 Criteria for alcohol dependence

1. Evidence of tolerance to the effects of alcohol, such that there is a need for markedly increased amounts to achieve intoxication or desired effect, or that there is a markedly diminished effect with continued use of the same amount of alcohol.
2. A physiological withdrawal state when alcohol use is reduced or ceased, as evidenced by the characteristic withdrawal syndrome for the substance, or use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms.
3. Persisting with alcohol use despite clear evidence of harmful consequences as evidenced by continued use when the person was actually aware of, or could be expected to have been aware of, the nature and extent of harm.
4. Preoccupation with alcohol use, as manifested by: important alternative pleasures or interests being given up or reduced because of alcohol use; or a great deal of time being spent in activities necessary to obtain alcohol, consume it, or recover from its effects.
5. Impaired capacity to control drinking behavior in terms of its onset, termination or level of use, as evidenced by: alcohol being often taken in larger amounts or over a longer period than intended, or any unsuccessful effort or persistent desire to cut down or control alcohol use.
6. A strong desire or sense of compulsion to use alcohol.

Ill-defined terms not recommended for use There are a number of ill defined terms that the report does not use, including:

- **moderate drinking** The report has avoided the use of the word 'moderate', since it is an inexact term for a pattern of drinking that is by implication contrasted with heavy drinking. Although it commonly denotes drinking that does not cause problems (and thus is not drinking to 'excess'), it is difficult to define. A better description might be *lower-risk drinking*.
- **sensible drinking, responsible drinking and social drinking**, all of which are impossible to define and depend on social, cultural and ethical values which can differ widely from country to country, from culture to culture, and from time to time.
- **excessive drinking** is currently a non-preferred term for a pattern of drinking considered to exceed some standard of light drinking. *Hazardous use* is the preferred term in current use.

3. Describing alcohol consumption and alcohol related harm

- **alcoholism** is a term of long-standing use and variable meaning, generally taken to refer to chronic continual drinking or periodic consumption of alcohol which is characterized by impaired control over drinking, frequent episodes of intoxication, and preoccupation with alcohol and the use of alcohol despite adverse consequences. The inexactness of the term led a WHO Expert Committee to disfavour it, preferring the narrower formulation of alcohol dependence syndrome as one among a wide range of alcohol-related problems (Edwards & Gross 1976; World Health Organization 1980), and it is not included as a diagnostic entity in ICD-10. The preferred term is *alcohol dependence*.
- **alcohol abuse** a term in wide use but of varying meaning. Although it is used in the DSM (Diagnostic and Statistical Manual of Mental Disorders) classification (American Psychiatric Association 1994), it should be regarded as a residual category, with dependence taking precedence when applicable. The term is sometimes used disapprovingly to refer to any use at all, particularly of illicit drugs. Because of its ambiguity, the term is not used in the ICD-10 classification. *Harmful use* and *hazardous use* are the equivalent terms.
- **alcohol misuse** is a term that describes the use of alcohol for a purpose not consistent with legal or medical guidelines, as in the non-medical use of prescription medications. Although misuse is preferred by some to abuse in the belief that it is less judgmental, it is also ambiguous. *Hazardous use* is the equivalent term.

3.3. Do hazardous and harmful drinking and dependence on alcohol exist within a continuum?

Alcohol consumption, alcohol-related harm and alcohol dependence exist within a continuum. Alcohol consumption ranges from not drinking alcohol, through low risk drinking, hazardous drinking, harmful drinking to alcohol dependence. In the same way, the harm done by alcohol ranges from no harm through mild harm, substantial and severe harm. Alcohol consumption and the harm done by alcohol are not fixed entities and individuals can move back and forth along the continuum, including in and out of alcohol dependence during their lives. An American study found that of people with alcohol dependence prior to the last year, 18% were found to be abstainers during the last year, 18% were low-risk drinkers, 12% were asymptomatic risk drinkers who demonstrated a pattern of drinking that put them at risk of relapse, 27% were classified as being in partial remission, and 25% were still classified as dependent (Dawson et al. 2005). Only one quarter of all these people had ever received treatment for alcohol dependence.

3. Describing alcohol consumption and alcohol related harm

The aetiology and the course of harmful drinking and alcohol dependence are to a large extent explained by behavioural, environmental and life course factors (McLellan et al. 2000; Bacon 1973; Öjesjö 1981; Edwards 1989; Moos et al. 1990); they can be described as environmentally responsive (Curran et al. 1987; Pattison et al. 1977; Humphreys et al. 2002) clinical disorders; they are readily responsive to environmental policy factors, such as the price of alcohol and regulations on the availability of alcohol (Bruun et al. 1975; Edwards et al. 1994; Babor et al. 2003); they are also readily responsive to treatment (Klingemann et al. 1992; Blomqvist 1998), whose impact is likely to be enhanced in the presence of effective environmental policies.

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4. Alcohol and health

Summary of chapter evidence

1. Does alcohol increase the risk of social harms and harms to others?

Alcohol increases the risk of a wide range of social harms in a dose dependent manner, with no evidence for a threshold effect. For the individual drinker, the higher the alcohol consumption, the greater is the risk. Harms done by someone else's drinking range from social nuisances such as being kept awake at night through more serious consequences such as marital harm, child abuse, crime, violence and ultimately, homicide. Generally the more serious the crime or injury, the more likely alcohol is to be involved. Harm to others is a powerful reason to intervene for hazardous and harmful alcohol consumption.

2. Does alcohol increase the risk of ill-health?

Apart from being a drug of dependence, alcohol is a cause of 60 or so different types of disease and injury, including injuries, mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular diseases, immunological disorders, skeletal diseases, reproductive disorders and pre-natal harm. Alcohol increases the risk of these diseases and injuries in a dose dependent manner, with no evidence for a threshold effect. The higher the alcohol consumption, the greater is the risk.

3. Does alcohol reduce the risk of heart disease?

A small dose of alcohol consumption reduces the risk of heart disease, although the exact size of the reduction in risk and the level of alcohol consumption at which the greatest reduction occurs is still debated. Better quality studies and those that account for possible influencing factors find less of a risk, and at a lower level of alcohol consumption. Most of the reduction in risk can be achieved by an average of 10g of alcohol every other day. Beyond 20g of alcohol a day the risk of coronary heart disease increases. It appears to be alcohol that reduces the risk of heart disease rather than any specific beverage type. Drinking larger amounts of alcohol on one occasion increase the risk of cardiac arrhythmias and sudden coronary death.

4. Is the consumption of alcohol risk free?

The risk of death from alcohol is a balance between the risk of diseases and injuries that alcohol increases and the risk of heart disease that in small amounts alcohol decreases. This balance shows that, except for older people, the consumption of alcohol is not risk free. The level of alcohol consumption with the lowest risk of death is zero or near zero for women under the age of 65, and less than 5g of alcohol a day for women aged 65 years or older. For men, the level of alcohol consumption with the lowest risk of death is zero under 35 years of age, about 5g a day in middle age, and less than 10g a day when aged 65 years or older.

5. What determines hazardous and harmful drinking and dependence on alcohol?

Genes play a role in the risk of harmful alcohol use and alcohol dependence, with some genes increasing the risk and other genes decreasing the risk. There is an interaction between genes and the environment, and people who drink more alcohol or who live in an environment in which more alcohol is drunk are those who are at increased risk of alcohol-related ill health. At any given level of alcohol consumption, women appear to be at increased risk, with differing sizes of risk with different illnesses. This is probably due to the fact that women have a lower amount of body water per weight than do men. Up to one quarter of the increased risk of death in middle aged men in lower socio-economic groups than in higher socio-economic groups may be due to alcohol.

6. How important is alcohol as a cause of ill-health?

Throughout the European Union as a whole, alcohol is one of the most important causes of ill-health and premature death. It is less important than smoking and raised blood pressure, more important than high cholesterol levels and overweight.

7. Does reducing alcohol use lead to improvement in health?

There are health benefits from reducing or stopping alcohol consumption. All acute risks can be completely reversed if alcohol is removed. Even amongst chronic diseases, such as liver cirrhosis and depression, reducing or stopping alcohol consumption are associated with rapid improvements in health.

Recommendations

1. Since alcohol is implicated in a very wide variety of physical and mental health problems in a dose dependent manner, there is an opportunity for all primary health care providers to identify all adult patients with hazardous and harmful alcohol consumption.
2. Since primary health care involves the treatment of many common physical and mental conditions, their causes in the use of alcohol need to be addressed and managed. It is of particular importance to reduce the risk of harm to others.

4. Alcohol and health

4.1. Does alcohol increase the risk of social harms and harms to others?

Alcohol and social pleasure

The use of alcohol brings with it a number of pleasures (Peele & Grant 1999; Peele & Brodsky 2000). The notion that a low consumption of alcohol is good for health is possibly as old as the history of alcohol itself (Thom 2001) and is embedded in folk wisdom (Cherrington 1925). When respondents in general populations are asked their expectations about the effects of alcohol, more positive than negative sensations and experiences are usually mentioned. (e.g., relaxation, sociability), with little mention of harm (Mäkelä & Mustonen, 1988; Mäkelä & Simpura, 1985; Nyström, 1992).

Alcohol plays a role in everyday social life, marking such events as births, weddings and deaths, as well as marking the transition from work to play and easing social intercourse. Throughout history and in many different cultures, alcohol is a common means for friends and companions to enhance the enjoyment of each other's company and generally have fun (Heath 1995).

The benefits to those who drink during social occasions are greatly influenced by culture, the setting in which drinking occurs, and people's expectations about alcohol's effects. So strong are these beliefs about alcohol that people become observably more sociable when they think that they have consumed alcohol but actually have not (Darkes & Goldman 1993). That alcohol improves the drinker's mood in the short term is an important reason why many people drink (Hull & Stone 2004). There is, indeed, a large amount of evidence that the immediate effects of alcohol include increased enjoyment, euphoria, happiness and the general expression of positive moods, feelings that are experienced more strongly in groups than when drinking alone (Pliner & Cappell 1974), and very much influenced by expectations (Brown et al. 1980; Hull et al. 1983). In the few studies available of people who reported receiving psychological benefits from alcohol use, the number of benefits reported correlated with how much alcohol they drank as well as with how often they drank heavily (Mäkelä & Mustonen 1988). Of course, the heavier drinkers in the study were also more likely to report problems from use, and the ratio of benefits to problems tended to decline for the heaviest drinkers.

Although stress reduction, mood elevation, increased sociability, and relaxation are the most commonly reported psychosocial benefits of drinking alcohol (Hull & Bond 1986; Baum-Baicker 1987), the effectiveness of alcohol use relative to other means for reducing stress-related diseases has not been studied. However, there is extensive evidence indicating that individuals who suffer psychological distress and rely on alcohol to relieve their stress are more likely to become dependent on alcohol (Kessler et al. 1996 1997; Book & Randall 2002). In any one year, over one in eight individuals with an anxiety disorder also suffer from an alcohol use disorder (Grant et al. 2004). Alcohol is also commonly seen as aiding sleep – but while it may induce sleep, it also leads to increased

wakefulness and arousal several hours later, and aggravates sleep disorders (Castaneda et al. 1998).

Alcohol and its negative social consequences

Alcohol is often drunk for its intoxicating effects, and many drinkers, and in particular younger men, deliberately and consciously use alcohol to become intoxicated, i.e. to get drunk. It is this intoxication that is a common cause of social harm.

The risk of the most commonly experienced negative social consequences of alcohol – such as getting into a fight, harming home life, marriage, work, studies, friendships or social life – increases proportionally to the amount of alcohol consumed, with no clear evidence of a threshold effect (Figure 4.1). The increased risk at the lowest levels of alcohol consumption is largely due to low volume drinkers who occasionally consume larger quantities (Rehm & Gmel 1999).

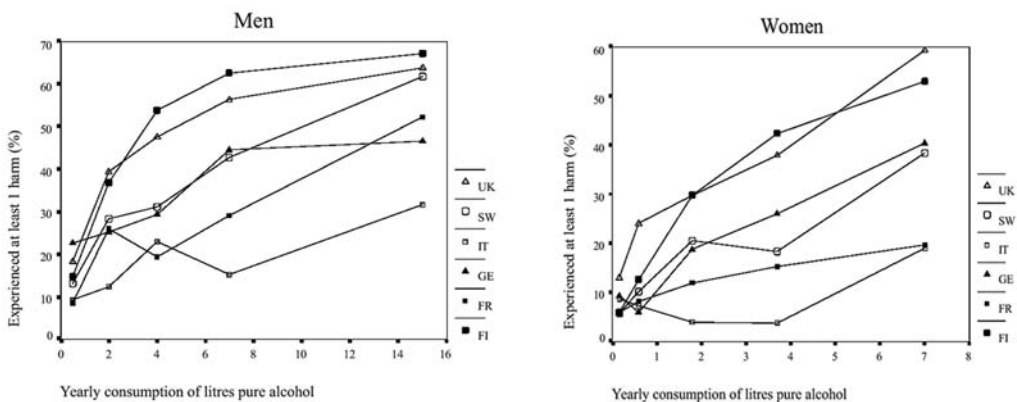


Figure 4.1 Increasing the risk of at least one negative social consequence (getting into a fight, harming home life, marriage, work, studies, friendships or social life) by yearly alcohol consumption for selected European countries. UK United Kingdom, SW Sweden, IT Italy, GE Germany, FR France, FI Finland. Source: Norström et al. 2001.

Social harms from other people's drinking are also common, being more common for less severe consequences (such as being kept awake at night by drunk people) than for being harassed in public places, being harassed in private parties, being insulted and being afraid of drunk people in public areas, as well as more severe types of consequences (such as being physically hurt or property damage) (Rossow & Hauge 2004). Studies show that a small proportion of the population are harmed repeatedly and in various ways, with younger people, women, those who report a higher annual alcohol intake, more frequent episodes of intoxication and more frequent visits to public drinking places being more likely to have received harm from someone else's drinking (Rossow 1996; Mäkelä et al. 1999). The drinking behaviour of the typical victim of social harms from

4. Alcohol and health

others' drinking very much resembles the drinking behaviour of those who experience various kinds of alcohol-related social harms from their own drinking (Hauge & Irgens-Jensen 1986; Room et al. 1995; Midanik 1999; Mustonen & Mäkelä 1999; Rehm & Gmel 1999). The harm done by alcohol to people other than the drinker is summarized in Box 4.1

Box 4.1 The harm done by alcohol to people other than the drinker	
CONDITION	Summary of findings
Negative social consequences	Social harms from other people's drinking are more common for less severe consequences (such as being kept awake at night by drunk people) than for more severe ones (such as being afraid of drunk people in public areas). Negative social consequences to others have higher rates in the population than social consequences to the drinker.
Violence and crime	There is a relationship between alcohol consumption and the risk of involvement in violence (including homicide), which is stronger for intoxication than for overall consumption. There are also relationships between greater alcohol use and sexual violence (particularly violence against strangers) and domestic violence (although this is attenuated when other factors are taken into account). Generally the higher the level of alcohol consumption, the more serious the violence.
Marital harm	Beyond a strong association between heavy drinking and marital breakdown, a few well-designed studies have demonstrated a significantly increased risk of separation or divorce among married heavy drinkers.
Child abuse	A large number of studies, not always of good methodology, have reported a variety of childhood adversities to be more prevalent among children of heavy drinkers than others.
Work related harm	Higher alcohol use results in lowered productivity and increased injury to others.
Drinking and driving	The risk of crashes and injuries to others from drinking increases with the number of heavy drinking occasions.
Pre-natal conditions	Alcohol shows reproductive toxicity. Prenatal exposure to alcohol can be associated with a distinctive pattern of intellectual deficits that become apparent later in childhood. Even though the volume of drinking may be low, drinking several drinks at a time during pregnancy can increase the risk of spontaneous abortion, low birth weight, prematurity and intra-uterine growth retardation and may reduce milk production in breastfeeding mothers.

Violence A substantial proportion of incidents of aggression and violent crime involves one or more participants who have been drinking (Pernanen 1991; Collins 1993; Wells et al. 2000; Pernanen et al. 2002; Allen et al. 2003), with an average of 40– 50% of violent crimes involving a person who has consumed alcohol, the proportion varying across countries and cultures (Murdoch, Pihl & Ross 1990). There is a relationship between alcohol consumption and the risk of involvement in violence, including homicide, which is stronger for intoxication than for overall consumption (Rossow 2000; Wells et al 2000). A large number of studies have demonstrated a significantly increased risk of involvement in violence among heavy drinkers, who are also more likely to be the recipients of violence (Rossow et al. 2001; Greenfield & Henneberg 2001).

Heavy episodic drinking, frequency of drinking and drinking volume are all independently associated with the risk of aggression (Wechsler et al. 1994; Wechsler et al. 1995; Wechsler et al. 1998; Komro et al. 1999; Bonomo et al. 2001; Swahn 2001; Ricahrdson & Budd 2003; Swahn & Donovan 2004; Wells et al. 2005), with frequency of drinking appearing to be the most important (Wells et al 2005). Drinking volume was associated with alcohol-related aggression in a general population sample even when high-quantity drinking was controlled (Room et al. 1995).

There is an overall relationship between greater alcohol use and criminal and domestic violence, with particularly strong evidence from studies of domestic and sexual violence (Mirrlees-Black 1999; Abbey et al. 2001; Caetano et al. 2001; Brecklin & Ullman 2002; White & Chen 2002; Lipsey et al. 1997; Greenfeld 1998). The relationship is attenuated when other characteristics, such as culture, gender, age, social class, criminal status, childhood abuse, and use of other drugs in addition to alcohol are taken into account. Generally the higher the level of alcohol consumption, the more serious is the violence (Gerson & Preston 1979; Martin & Bachman 1997; Sharps et al. 2001). Studies from the United Kingdom (Mirrlees-Black 1999) and Ireland (Watson & Parsons 2005) indicate that one third of intimate partner violence occurs when the perpetrator was under the influence of alcohol. Violence against strangers is more likely to involve alcohol than is violence against intimate partners (Abbey et al. 2001; Testa & Parks 1996).

High blood alcohol levels or high levels of consumption are commonly reported not only in the perpetrators of violence, but also in the recipients (Makkai 1997; Mirrlees-Black 1999; Brecklin & Ullman 2002). Alcohol related sexual assaults by strangers seem to be more likely to occur the greater the alcohol consumption of the recipient, whereas the risk of alcohol-related sexual assaults by partners or spouses seems to be independent of the alcohol consumption of the recipient (Kaufman Kantor & Asdigian 1997; Chermack et al. 2001). Many recipients develop drinking problems as a response to sexual violence (Darves-Bornoz et al. 1998).

Aside from epidemiological and experimental research that supports a causal link of intoxication and violence (Graham & West 2001), there is also research indicating specific biological mechanisms that link alcohol to aggressive behaviour (Bushman 1997; Lipsey et al 1997), which are moderated by situational and cultural factors (Wells & Graham 2003). The pharmacological effects of alcohol include increased emotional lability and focus on the present (Graham et al. 2000), decreased awareness of internal cues or less self-awareness (Hull 1981), decreased ability to consider consequences (Hull & Bond 1986; Pihl et al. 1993; Ito et al. 1996) or reduced ability to solve problems (Sayette et al. 1993), and impaired self-regulation and self-control(Hull & Slone 2004).

4. Alcohol and health

Alcohol appears to interact with personality characteristics and other factors related to a personal propensity for violence, such as impulsivity (Zhang et al. 1997, Lang & Martin 1993). Injuries from violence may also be more closely linked to alcohol dependence than other types of alcohol-related injury (Cherpitel 1997). In addition to alcohol consumption and drinking pattern, the social context of drinking is also important for alcohol related aggression (Eckardt et al. 1998; Fagan 1990; Martin 1992; Collins & Messerschmidt 1993; Graham et al. 1998; Parker & Auerhahn 1998), especially for young people whose drinking behaviour is influenced strongly by peers (Hansen 1997). A meta-analysis found that the effects of alcohol were greater in situations characterized by greater anxiety, inhibition conflict and frustration, while differences between sober and intoxicated persons were smaller in situations involving high provocation or self-focused attention (Ito et al. 1996). Further, given sufficient disincentives for aggression the effects of alcohol on aggression can be reduced or even eliminated altogether (Hoaken et al. 1998; Jeavons & Taylor 1985).

Public drinking establishments are high-risk locations for alcohol-related aggression (Pernanen 1991; Stockwell et al. 1993; Archer et al. 1995; Rossow 1996; Leonard et al. 2002). However, drinking contexts by themselves do not explain the relationship between alcohol and aggression, since the impact of alcohol also acts independently of the context or setting in which drinking is taking place (Wells et al 2005). However, the environment for alcohol-related aggression is not independent of drinking. For example, in environments devoted to drinking such as bars and pubs, it does not make sense to try to determine the proportion of violence that would have occurred even if the person had not been drinking, because such environments do not exist without drinking. Although a few incidents that occur in bars involve interpersonal conflict between friends or couples that might have occurred in another setting, almost all incidents of aggression that occur in bars are unplanned, emerge from the social interaction in the bar (Graham & Wells 2001) and often involve strangers. Therefore, it seems reasonable to assume that almost all incidents of violence occurring in bars and other environments where drinking is the main activity should be considered attributable to alcohol, either directly through the pharmacological effects of alcohol or indirectly through the social norms related to drinking.

Marital harm and violence A large number of cross-sectional studies have demonstrated a significant positive association between heavy drinking and the risk of marital breakdown (Leonard & Rothbard 1999), but only a few well-designed studies have demonstrated a significantly increased risk of separation or divorce among married heavy drinkers as compared to others (Fu & Goodman 2000). A large number of cross-sectional studies (Lipsey et al. 1997; Leonard 2005) and a few longitudinal studies on alcohol consumption and marital aggression have shown that husbands' heavy drinking increases the risk of marital violence (Quigley & Leonard 1999), in a dose dependent manner (Kaufman Kantor & Straus 1987). It also seems that treatment for alcohol dependence

reduces intimate partner violence (O'Farrell & Choquette 1991; O'Farrell et al. 1999; O'Farrell et al. 2000; O'Farrell et al. 2003; Stuart et al. 2003). Women with alcohol-related problems often have marital problems (Blankfield & Maritz 1990), and are less confident about resolving marital disagreement (Kelly et al. 2000). Women who are alcohol-dependent report high rates of aggression in their spouses (Miller et al. 1989, Miller & Downs 1993) and women who are in receipt of alcohol related violence tend to drink more (Olenick & Chalmers 1991).

Child abuse A large number of studies have reported a variety of childhood mental and behavioural disorders to be more prevalent among children of heavy drinkers than others, although many of these studies have been criticized for inadequate methodology (Miller et al. 1997; Rossow 2000; Widom & Hiller-Sturmhofel 2001). A few recent reports from well-designed studies have shown a higher risk of child abuse in families with heavy drinking parents (Rossow 2000).

Reduced work performance Higher alcohol use results in increased unemployment (Mullahy & Sindelar 1996) and potentially reduced earnings relative to lighter drinking (Hamilton & Hamilton 1997). Higher alcohol use and intoxication increase the risk of absenteeism (including arriving to work late and leaving work early) due to illness, or disciplinary suspension, resulting in loss of productivity; turnover due to premature death; disciplinary problems or low productivity from the use of alcohol; inappropriate behaviour (such as behaviour resulting in disciplinary procedures); theft and other crime; and poor co-worker relations and low company morale (Marmot et al 1993; Mangione et al. 1999; Rehm & Rossow 2001).

4.1. Does alcohol increase the risk of ill-health?

Alcohol is a toxic substance related to more than 60 different acute and chronic disorders (Gutjahr et al. 2001; English et al. 1995; Ridolfo & Stevenson 2001). The relationship between alcohol consumption and risk of ill-health for some more important conditions is summarized in Table 4.1. For many conditions there is an increasing risk with increasing levels of alcohol consumption, with no evidence of a threshold effect (Rehm et al. 2003), and with the slopes of the risks varying by gender (Corrao et al. 1999; Corrao et al. 2004). Box 4.2 summarizes the harms done by alcohol to the individual drinker.

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Table 4.1. Relative risks for selected conditions where alcohol is a risk factor

	Women			Men		
	Alcohol consumption, g/day					
	0-19	20-39	40+	0-39	40-59	60+
Neuro-psychiatric conditions						
Epilepsy	1.3	7.2	7.5	1.2	7.5	6.8
Gastrointestinal conditions						
Cirrhosis of the liver	1.3	9.5	13.0	1.3	9.1	13.0
Oesophageal varices	1.3	9.5	9.5	1.3	9.5	9.5
Acute and chronic pancreatitis	1.3	1.8	1.8	1.3	1.8	3.2
Metabolic and endocrine conditions						
Diabetes mellitus	0.9	0.9	1.1	1.0	0.6	0.7
Malignant neoplasms						
Mouth and oropharynx cancers	1.5	2.0	5.4	1.5	1.9	5.4
Oesophageal cancer	1.8	2.4	4.4	1.8	2.4	4.4
Laryngeal cancer	1.8	3.9	4.9	1.8	3.9	4.9
Liver cancer	1.5	3.0	3.6	1.5	3.0	3.6
Breast cancer	1.1	1.4	1.6			
Other neoplasms	1.1	1.3	1.7	1.1	1.3	1.7
Cardiovascular (CVD) diseases						
Hypertensive disease	1.4	2.0	2.0	1.4	2.0	4.1
Coronary heart disease	0.8	0.8	1.1	0.8	0.8	1.0
Ischaemic stroke	0.5	0.6	1.1	0.9	1.3	1.7
Haemorrhagic stroke	0.6	0.7	8.0	1.3	2.2	2.4
Cardiac arrhythmias	1.5	2.2	2.2	1.5	2.2	2.2
Conditions arising during the perinatal period						
Spontaneous abortion	1.2	1.8	1.8	1.0	1.4	1.4
Low birth weight ¹	1.0	1.4	1.4	0.9	1.4	1.4
Prematurity ¹	0.9	1.4	1.4	1.0	1.7	1.7
Intrauterine growth retardation ¹	1.0	1.7	1.7			

¹Relative risk refers to drinking of mother

Source: Rehm et al. (2004)

Box 4.2 The harm done by alcohol to the individual drinker		
	CONDITION	Summary of findings
Social well being	Negative social consequences	For getting into a fight, harming home life, marriage, work, studies, friendships or social life, the risk of harm increases proportional to the amount of alcohol consumed, with no clear evidence of a threshold effect.
	Reduced work performance	Higher alcohol use results in reduced employment and increased unemployment and absenteeism.
Intentional and unintentional injuries	Violence	There is an almost linear relationship between alcohol consumption and the risk of involvement in violence.
	Drinking and driving	The risk of drinking and driving increases with both the amount of alcohol consumed and the frequency of high volume drinking occasions. There is a 38% increased risk of accidents at a blood alcohol concentration level of 0.5g/L.
	Injuries	There is a relationship between the use of alcohol and the risk of fatal and non-fatal accidents and injuries. People who usually drink alcohol at lower levels, but who engage periodically in drinking large quantities of alcohol are at particular risk. Alcohol increases the risk of attendance at hospital emergency rooms in a dose dependent manner and increases the risk of operations and surgical complications.
	Suicide	There is a direct relationship between alcohol consumption and the risk of suicide and attempted suicide, which is stronger for intoxication than for overall consumption.
Neuro-psychiatric conditions	Anxiety and sleep disorders	Over one in eight of individuals with an anxiety disorder also suffer from an alcohol use disorder. Alcohol aggravates sleep disorders.
	Depression	Alcohol use disorders are a risk factor for depressive disorders in a dose dependent manner, often preceding the depressive disorder, and with improvement of the depressive disorder following abstinence from alcohol.
	Alcohol dependence	The risk of alcohol dependence begins at low levels of drinking and increases directly with both the volume of alcohol consumed and a pattern of drinking larger amounts on an occasion.
	Nerve damage	Over a sustained period of time, but in a dose dependent manner, alcohol increases the risk of damage to the peripheral nerves of the body.

4. Alcohol and health

	CONDITION	Summary of findings
	Brain damage	Heavy alcohol consumption accelerates shrinkage of the brain, which in turn leads to cognitive decline. There appears to be a continuum of brain damage in individuals with long-term alcohol dependence.
	Cognitive impairment and dementia	Heavy alcohol consumption increases the risk of cognitive impairment in a dose dependent manner.
	Addictive disorders	Alcohol consumption and tobacco use are closely linked behaviours and heavier smoking is associated with heavier drinking.
	Schizophrenia	Risky drinking is more common among people with a diagnosis of schizophrenia. Low levels of alcohol consumption can worsen the symptoms and interfere with the effectiveness of treatment.
Gastro-intestinal conditions	Liver cirrhosis	Alcohol increases the risk of liver cirrhosis in a dose dependent manner. At any given level of alcohol consumption, women have a higher likelihood of developing liver cirrhosis than men.
	Pancreatitis	Alcohol increases the risk of acute and chronic pancreatitis in a dose dependent manner.
	Type II diabetes	Although low doses decrease the risk compared with abstainers, higher doses increase the risk.
Cancers	Gastrointestinal tract	Alcohol increases the risk of cancers of the mouth, oesophagus (gullet) and larynx (upper airway), and to a lesser extent, cancers of the stomach, colon and rectum in a linear relationship.
	Liver	Alcohol increases the risk of cancer of the liver in an exponential relationship.
	Breast	There is now strong evidence that alcohol increases the risk of female breast cancer.
Cardiovascular diseases	Hypertension	Alcohol raises blood pressure and increases the risk of hypertension, largely in a dose dependent manner.
	Stroke	Alcohol can increase the risk of both haemorrhagic and ischaemic stroke, with a stronger dose-response relationship for haemorrhagic stroke. Although individual studies find that light drinking reduces the risk of ischaemic stroke, a systematic review combining all studies found no clear evidence of a protective effect of light to moderate drinking on the risk of either ischaemic stroke or overall stroke. Alcohol intoxication is an important risk factor for both ischaemic and haemorrhagic stroke, and is particularly important as a cause of stroke in adolescents and young people.
	Irregularities in heart rhythms	Episodic heavy drinking increases the risk of heart arrhythmias and sudden coronary death, even in people without any evidence of pre-existing heart disease

	CONDITION	Summary of findings
	Coronary heart disease (CHD)	Although light drinking reduces the risk of CHD, beyond 20g a day (the level of alcohol consumption with the lowest risk), the risk of heart disease increases, being more than the risk of an abstainer after 80g a day.
Immune system		Alcohol can interfere with the normal functions of the immune system, causing increased susceptibility to certain infectious diseases, including pneumonia, tuberculosis and HIV.
Skeletal conditions		There appears to be a dose-dependent relationship between alcohol consumption and risk of fracture in both men and women, that is stronger for men than for women.
Reproductive conditions		Alcohol can impair fertility in both men and women.
Total mortality		In younger people (women under the age of 45 years and men under the age of 35 years), any level of alcohol consumption increases the overall risk of death in a dose dependent manner.

Unintentional and intentional injuries

Drinking and driving The risk of drinking and driving increases with both the amount of alcohol consumed and the frequency of high volume drinking occasions (Midanik et al. 1996). Comparison of blood alcohol concentrations (BACs) of drivers in accidents with the BACs of drivers not involved in accidents generate risk curves with a 38% increased risk of accidents at 0.5g/L and nearly 5 times the risk at 1.0g/L (Blomberg et al. 2002). The risks are steeper for serious and fatal crashes, for single-vehicle crashes, and for younger people. The use of alcohol increases both the possibility of being admitted to hospital from drink-drive injuries, and the severity of the injuries (Borges et al. 1998).

Injuries There is a relationship between the use of alcohol and the risk of fatal and non-fatal accidents and injuries (Cherpitel et al. 1995; Brismar & Bergman 1998; Smith et al. 1999). In an Australian study, the risk of sustaining an injury after consuming more than 60 g of alcohol in a 6-hour period was ten times greater for women and two times greater for men (McLeod et al. 1999). People who usually drink alcohol at lower levels, but who engage periodically in drinking large quantities of alcohol are at particular risk (Watt et al. 2004). Alcohol increases the risk of attendance at hospital emergency rooms in a dose dependent manner (Cherpitel 1993; Cherpitel et al. 2003; Borges et al. 2004); between 20% and 80% of emergency room admissions are alcohol-related (Hingson & Howland 1987). Alcohol alters the treatment course of injured patients and can lead to surgical complications (Smith et al. 1999) and a greater likelihood of death (Li et al. 1994).

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Suicide Heavy drinking is a major risk factor for suicide and suicidal behaviour among both young people and adults (Shaffer et al. 1996, Lesage et al. 1994, Andrews & Lesinsohn 1992; all cited in Beautrais 1998). There is a direct relationship between alcohol consumption and the risk of suicide and attempted suicide, Figure 4.2, which is stronger for intoxication than for overall consumption (Rossow 1996).

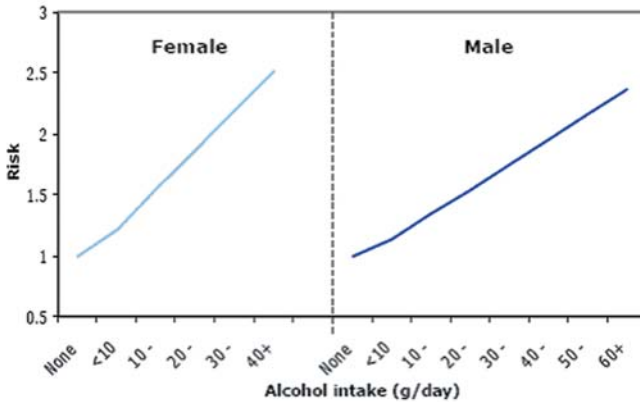


Figure 4.2 Relative risks of suicide by alcohol intake. Source: Strategy Unit (2003).

Neuropsychiatric conditions

Depression There is consistency across many studies that people with depression and mood disorders are at increased risk of alcohol dependence and vice versa (Regier et al 1990; Merikangas et al. 1998; Swendson et al. 1998; Kringlen et al 2001; de Graaf et al 2002; Petrakis et al 2002; Sonne & Brady 2002). Alcohol-dependent individuals demonstrate a two- to three-fold increase in risk of depressive disorders (Hilarski and Wodarki 2001; Schuckit 1996; Swendson et al. 1998), and there is evidence for a continuum in the magnitude of comorbidity as a function of level of alcohol use (Kessler et al 1996; Merikangas et al. 1998; Rodgers et al. 2000). There are several plausible biological mechanisms by which alcohol dependence may cause depressive disorders (Markou et al. 1998).

One American study found that in any one year, 11% of individuals with major depression were dependent on alcohol (Grant et al 2004), see Tables 4.2 to 4.3. Conversely, 20% of people dependent on alcohol had a major depressive disorder.

Table 4.2 The risk of alcohol dependence in people with mood disorders (US data).

Comorbid Mood Disorders* and Substance Abuse			
	Any substance abuse or dependence (%)	Alcohol dependence (%)	Alcohol abuse (%)
Any Mood Disorder	32.0	4.9	6.9
Any Bipolar Disorder	56.2	27.6	16.1
Bipolar I	60.7	31.5	14.7
Bipolar II	48.1	20.8	18.4
Unipolar Depression	27.2	11.6	5.0

NOTES: *Mood disorders include depression and bipolar disorder. Bipolar disorder, or manic depression, is characterized by extreme mood swings. Bipolar I disorder is the most severe bipolar disorder. Bipolar II disorder is less severe. Unipolar depression is depression without manic episodes. Source: Data reported in the table are based on findings of the Epidemiologic Catchment Area study (Regler et al. 1990).

Table 4.3 The risk of mood disorders in people with alcohol dependence (US data).

Prevalence of Psychiatric Disorders in People with Alcohol Abuse and Alcohol Dependence				
Comorbid Disorder	Alcohol abuse		Alcohol dependence	
	1-year rate (%)	Odds ratio	1-year rate (%)	Odds ratio
National Comorbidity Survey¹				
Mood disorders				
Major depressive disorder	12.3	1.1	29.2	3.6*
Bipolar disorder	11.3	1.1	27.9	3.9*
Anxiety disorders	0.3	0.7	1.9	6.3*
GAD	29.1	1.7	36.9	2.6*
Panic disorder	1.4	0.4	11.6	4.6*
PTSD	1.3	0.5	3.9	1.7
	5.6	1.5	7.7	2.2*
Epidemiologic Catchment Area² study				
	Lifetime rate (%)	Odds ratio	Lifetime rate (%)	Odds ratio
Schizophrenia	9.7	1.9	24	3.8

NOTES: *Odds ratio was significantly different from 1 at 0.05 level. The odds ratio represents the increased chance that someone with alcohol abuse or dependence will have the comorbid psychiatric disorder (e.g., a person with alcohol dependence is 3.6 times more likely to also have a mood disorder compared to a person without alcohol dependence). The 1-year rate of a disorder reflects the percentage of people who met the criteria for the disorder during the year prior to the survey. The lifetime rate reflects the percentage of people who met the criteria for the disorder at any time in their lifetime.
Source: 1 Kessler et al. 1996.
2 Regier et al. 1990.

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Although depression may precede heavy alcohol consumption or alcohol use disorders, there is substantial comorbidity where the onset of alcohol use disorders precedes the onset of depressive disorders (Merikangas et al. 1998; Kessler et al. 1996; Rehm et al. 2004). Many depressive syndromes markedly improve within days or weeks of abstinence (Brown & Schuckit 1988; Dackis et al. 1986; Davidson 1995; Gibson & Becker 1973, Penick et al. 1988; Pettinati et al. 1982; Willenbring 1986).

Alcohol dependence No matter how drinking is measured, the risk of alcohol dependence begins at low levels of drinking and increases directly with both the volume of alcohol consumption and a pattern of drinking larger amounts on an occasion (Caetano et al. 2002). The two factors that contribute to the development of alcohol dependence are psychological reinforcement and biological adaptation within the brain (World Health Organization 2004).

Nerve damage (peripheral neuropathy) Over a sustained period of time, but in a dose dependent manner, alcohol increases the risk of damage to the nerves of the body, those dealing both with the senses and movement, and in particular those supplying the legs (Monforte et al. 1995). The effect is independent of malnutrition, but the extent to which malnutrition worsens the damage is unclear.

Cognitive impairment, dementia, and brain damage Alcohol consumption has both immediate and long-term detrimental effects on the brain and neuropsychological functioning. The relationship between heavy alcohol consumption and cognitive impairment is well established (Williams & Skinner 1990). People drinking 70 to 84 grams alcohol per day over an extended period of time show some cognitive inefficiencies; people drinking 98 to 126 grams alcohol per day show mild cognitive deficits; and 140 grams or more per day results in moderate cognitive deficits similar to those found in people with diagnosed alcohol dependence (Parsons & Nixon 1998). There is some indication that light alcohol consumption may reduce the risk for vascular caused dementia, whereas the effects on Alzheimer's disease and cognition remain uncertain, with some studies finding a relationship (Stampfer et al. 2005) and others not (Gunzerath et al. 2004). Frequent alcohol drinking in middle aged people was associated with cognitive impairment and harmful effects on the brain in later life in one Finnish study, which was more pronounced if there was a genetic susceptibility for dementia (Antilla et al. 2004).

Heavy drinking accelerates shrinkage of the brain, which in turn leads to cognitive decline (Rourke & Loberg 1996; Oscar-Berman & Marinkovic 2003). During adolescence, alcohol can lead to structural changes in the hippocampus (a part of the brain involved in the learning process) (De Bellis et al. 2000) and permanently impair brain development (Spear 2002). There appears to be a spectrum of brain damage in individuals with long-term alcohol dependence, ranging from moderate deficits to the severe psychosis of Wernicke-Korsakoff syndrome, which causes confusion, disordered gait, double vision and inability to retain new information.

Addiction to nicotine Alcohol consumption and tobacco use are closely linked behaviours. Thus, not only are people who drink alcohol more likely to smoke (and vice versa) but also people who drink larger amounts of alcohol tend to smoke more cigarettes. Smoking rates among people with alcohol dependence have been estimated to be as high as 90 percent. Similarly, smokers are far more likely to consume alcohol than are non-smokers, and smokers who are dependent on nicotine have a 2.7 times greater risk of becoming alcohol dependent than non-smokers (see Drobles 2002). This is one of the reasons for the consistent relationship between alcohol and lung cancer found in many epidemiological studies (Bandera et al. 2001; English et al. 1995).

Schizophrenia Not only is risky drinking more common among people with a diagnosis of schizophrenia (Hulse et al. 2000), but there is also evidence that even low levels of alcohol consumption can worsen the symptoms of this condition as well as interfere with the effectiveness of some standard medications (Castaneda et al. 1998). Furthermore, improved treatment outcomes have been achieved when harmful alcohol use and the schizophrenia have been tackled in an integrated fashion (Mueser & Kavanagh 2001).

Gastrointestinal conditions

Alcohol increases the risk of liver cirrhosis (Figure 4.3), and acute and chronic pancreatitis (Corrao et al. 1999). For men who die between the ages of 35 and 69, the risk of death from liver cirrhosis increases from 5 per 100,000 at no alcohol consumption to 41 per 100,000 at 4 or more drinks per day (Thun et al. 1997).

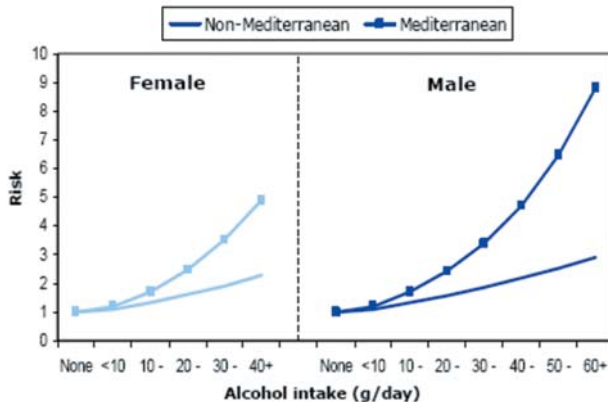


Figure 4.3 Relative risks of liver cirrhosis by alcohol intake. Source: Strategy Unit (2003).

Although a strong correlation exists between the risk of cirrhosis, the product of daily consumed alcohol in grams and the time of alcohol consumption, only approximately 20% of people with alcohol dependence develop liver cirrhosis. Some studies point to the existence of genetic factors which predispose to alcoholic liver disease. Thus, with respect to alcoholic cirrhosis, the concordance of homozygous (identical) twins was almost 15% compared to 5% for heterozygous

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(non-identical) twins (Lumeng & Crabb, 1994). Polymorphism of ethanol-metabolizing enzymes and/or mutations may also contribute to the risk of alcoholic liver disease. Some studies also show that increased incidence of some HLA-antigens, such as B8, Bw40, B13, A2, DR3 and DR2, are associated with an increased risk of developing alcoholic liver disease (Lumeng & Crabb, 1994). Drinking pattern is also of importance, since periodic drinking of larger quantities of alcohol carries a lower risk compared to continuous drinking for a longer period of time. There is an interaction with hepatitis C infection, with infection increasing the risk of liver cirrhosis at any given level of alcohol consumption, and increasing the severity of the cirrhosis (Schiff 1997; Schiff & Ozden 2003). There is also an apparent interaction with aliphatic alcohol congeners arising from home made spirits, which increase the risk of cirrhosis at any given level of alcohol consumption (Szucs et al. 2005). At any given level of alcohol consumption, women have a higher likelihood of developing liver cirrhosis than men (Mann et al. 2003).

There is apparently no association between alcohol consumption and the risk of gastric and duodenal ulcer (Corrao et al. 1999). There is some evidence that alcohol might reduce the risk of gall stones (Leitzmann et al. 1998; see Ashley et al. 2000), although this finding is not consistent across all studies (Sahi et al. 1998, Kratzer et al. 1997). This is in contrast to the increased risk of developing gallstones in patients with cirrhosis.

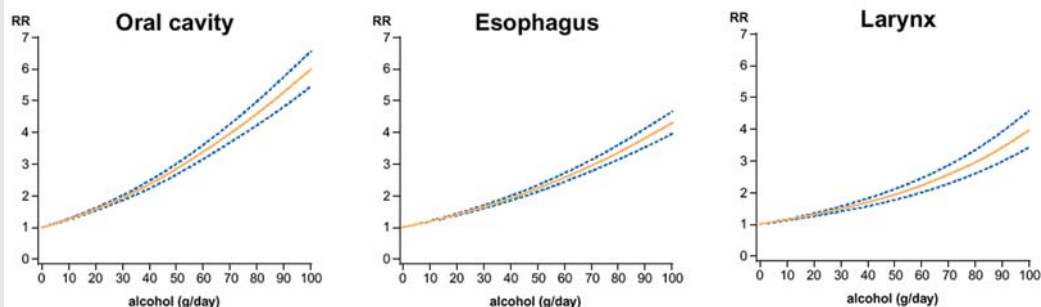
Endocrine and metabolic conditions

The relationship with type II diabetes appears to be U-shaped, with low doses decreasing the risk compared with abstainers (Rimm et al. 1995, Perry et al. 1995, Stampfer et al. 1988) and higher doses increasing the risk (Wei et al. 2000; Wannamethee et al. 2003). Not all studies find a decreased risk from lighter drinking (Hodge et al. 1993, Feskens & Kromhout 1989). Alcohol appears to increase the risk of obesity, although this is not the case for all studies (Wannamethee & Shaper 2003).

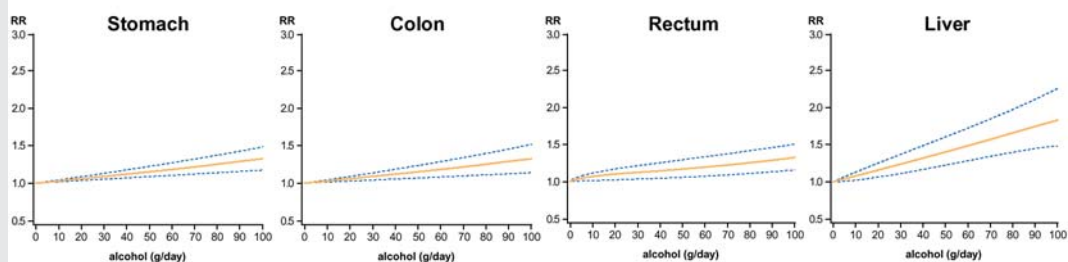
Cancers

Alcohol is a carcinogen and increases the risk of cancers of the mouth, oesophagus (gullet), larynx (upper airway), liver and female breast, and to a lesser extent, cancers of the stomach, colon and rectum in a linear relationship, Figure 4.4 (Bagnardi et al 2001a; Bagnardi et al 2001b). The annual risk of death from alcohol related cancers (mouth, gullet, throat and liver) increases from 14 per 100,000 for non-dinking middle-aged men to 50 per 100,000 at 4 or more drinks (40g alcohol) a day (Thun et al. 1997). There is now strong evidence that alcohol increases the risk of female breast cancer (Collaborative Group on Hormonal Factors in Breast Cancer 2002). The risk by age 80 years increases from 88 per 1000 non-drinking women to 133 per 1000 women who drink 6 drinks (60g) a day. It is possible that alcohol increases the risk of breast cancer by increasing sex hormone levels that are known to be a risk factor for breast cancer.

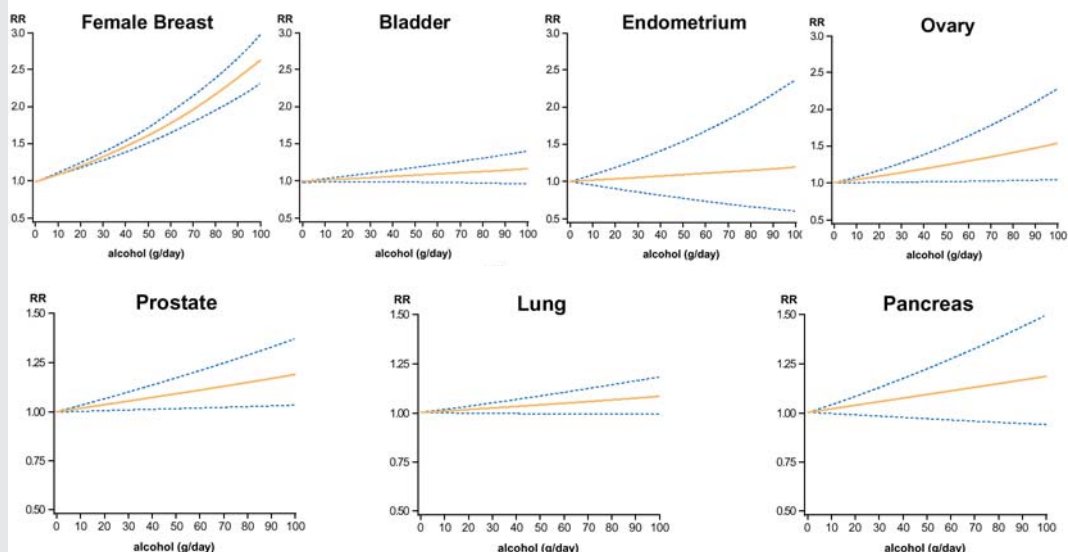
A. Neoplasms of the Upper-Aerodigestive Tract



B. Neoplasms of the Lower Digestive Tract



C. Other Neoplasms



Relationship between increasing amounts of alcohol and risk (i.e., relative risk or RR) for 14 types of cancer. The RR describes the strength of the relationship between a variable (e.g., alcohol consumption) and a disease (e.g., cancer). The RR for the disease in people without the variable (e.g., abstainers) is defined as 1.0. A RR among the people with the variable (e.g., drinkers) of greater than 1.0 indicates that the variable increases the risk for the disease. The greater the value, the greater the risk. The curves shown here were obtained by fitting certain statistical models to the data from several studies (i.e., a meta-analysis). Blue dotted lines indicate 95-percent confidence intervals; that is, the range of RR that is 95 percent likely to show a true RR.

Figure 4.4 Relationship between levels of alcohol consumption and risk for 14 types of cancer. Source: Bagnardi et al. 2001.

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A pooled analysis of original data from nine case controlled studies found that people who drank alcohol had a lower risk for some non-hodgkin lymphomas, but not all (a group of heterogeneous diseases characterized by the malignant transformation of healthy lymphoid cells) (Morton et al. 2005). The reduced risk was not related to level of alcohol consumption, and former drinkers had a similar risk to never drinkers. It is unclear the extent to which the findings could be explained by some unidentified confounders. Also, as noted above, there is a consistent relationship between alcohol and lung cancer (English et al. 1995), believed to be caused by smoking (Bandera et al. 2001).

Studies have also considered whether or not alcohol is genotoxic or mutagenic - a substance that can induce permanent changes in the way that cells, tissues, and organs, function, which may contribute to the development of cancer. A number of studies have suggested that alcohol has weak genotoxic potential following metabolic changes (Obe & Anderson 1987; Greim 1998). Although the importance of this is not clear (Phillips & Jenkinson 2001), a proposal was considered, but not decided, for the classification of ethanol by the European Chemicals Bureau (1999) of the European Commission as a category 2 mutagen (substances which should be regarded as mutagenic to man) under the Dangerous Substances Directive (67/548/EEC) classification system (Annex VI) (European Commission 2005).

Cardiovascular diseases

Hypertension Alcohol raises blood pressure and increases the risk of hypertension in a dose dependent manner (Beilin et al. 1996; Curtis et al. 1997; English et al. 1995; Grobbee et al. 1999; Keil et al. 1997; Klatsky 1996;.Klatsky 2001), (Figure 4.5).

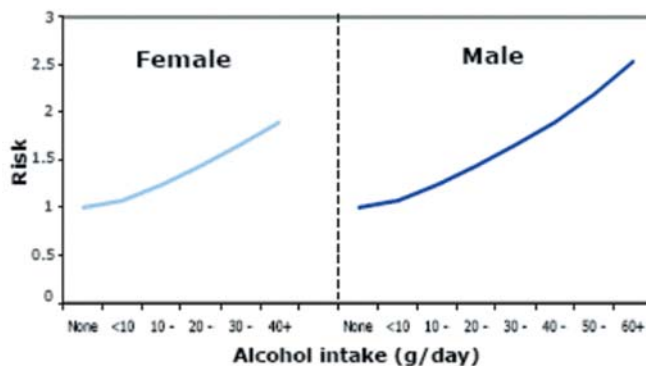


Figure 4.5 Relative risks of hypertension by alcohol intake. Source: Strategy Unit (2003).

Stroke There are two main types of stroke: ischaemic stroke which follows a blockage of an artery supplying blood to the brain; and haemorrhagic stroke (also including sub-arachnoid haemorrhage) which follows bleeding from a blood vessel within the brain. Alcohol can increase the risk of both types of stroke, with a stronger dose-response relationship for haemorrhagic stroke (Corrao et al. 1999), Figure 4.6. Although some individual studies find that light drinking reduces the risk of ischaemic stroke (Beilin et al. 1996; Hillbom 1998; Keil et al. 1997; Kitamura et al. 1998; Knuiman & Vu 1996; Sacco et al. 1999; Thun et al. 1997; Wannamethee & Shaper 1996), a systematic review combining all studies found no clear evidence of a protective effect of light to moderate drinking on the risk of either ischaemic stroke or overall stroke (Mazzaglia et al. 2001). Heavy episodic drinking is an important risk factor for both ischaemic and haemorrhagic stroke, and is particularly important as a cause of stroke in adolescents and young people. Up to 1 in 5 of ischaemic strokes in persons less than 40 years of age are alcohol-related, with a particularly strong association among adolescents (Hillbom & Kaste 1982).

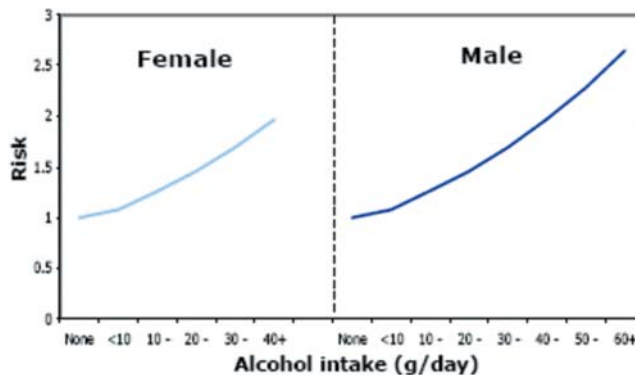


Figure 4.6 Relative risks of haemorrhagic stroke by alcohol intake. Source: Strategy Unit (2003).

Irregularities in heart rhythms Heavy episodic drinking increases the risk of heart arrhythmias and sudden coronary death, even in people without any evidence of pre-existing heart disease (Robinette et al. 1979; Suhonen et al. 1987; Wannamethee & Shaper 1992). Atrial fibrillation appears the most common form of arrhythmia induced by both consistent heavy alcohol consumption and high volume drinking occasions. It has been estimated that in 15%-30% of patients with atrial fibrillation, the arrhythmia may be alcohol-related, with possibly 5%-10% of all new episodes of atrial fibrillation explained by excess alcohol use (Rich et al. 1985).

Immune system

Alcohol can interfere with the normal functions of various components of the immune system, thereby leading to immune deficiency, causing increased

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susceptibility to certain infectious diseases, including pneumonia, tuberculosis, and HIV (US Department of Health and Human Services 2000).

Skeletal conditions

There appears to be a dose-dependent relationship between alcohol consumption and osteoporosis and risk of fracture in both men and women (US Department of Health and Human Services 2000; Preedy et al. 2001). It seems that the association between heavy alcohol use and decreased bone mass and increased fracture risk is less prevalent in women than in men (Sampson 2002), and there is even some evidence that women who consume alcohol in small doses generally have a higher bone mass than do women who abstain (Turner & Sibonga 2001).

Reproductive conditions

Alcohol can have negative consequences for both male and female reproduction. Alcohol use affects the endocrine glands and hormones involved in male reproduction and can reduce fertility through sexual dysfunction and impaired sperm production (Emanuele & Emanuele 2001). Alcohol consumption during early adolescence may suppress the secretion of specific female reproductive hormones, thereby delaying puberty and adversely affecting the maturation of the reproductive system (Dees et al. 2001). Beyond puberty, alcohol has been found to disrupt normal menstrual cycling, impairing fertility (Emanuele et al. 2002).

Pre-natal conditions

Alcohol shows reproductive toxicity. Prenatal exposure to alcohol can be associated with a distinctive pattern of intellectual deficits that become apparent later in childhood, including reductions in general intellectual functioning and academic skills as well as deficits in verbal learning, spatial memory and reasoning, reaction time, balance, and other cognitive and motor skills (Mattson et al. 2001; Chen et al. 2003; Koditowakko et al. 2003). Some deficits, like problems with social functioning, appear to worsen as these individuals reach adolescence and adulthood, possibly leading to an increased rate of mental health disorders (Jacobson & Jacobson 2002). Although these deficits are most severe and have been documented most extensively in children with Foetal Alcohol Syndrome (FAS), children pre-natally exposed to lower levels of alcohol can exhibit similar problems (Gunzerath et al. 2004) in a dose dependent manner (Sood et al. 2001). There is some evidence that alcohol even at low average volumes of consumption, and particularly during the first trimester of pregnancy can increase the risk of spontaneous abortion, low birth weight, prematurity and intra-uterine growth retardation (Abel 1997; Bradley et al. 1998; Windham et al. 1997; Albertsen et al. 2004; Rehm et al. 2004). There is also some evidence that

alcohol may reduce milk production in breastfeeding mothers (Mennella 2001; Gunzerath et al. 2004).

4.3. Does alcohol reduce the risk of heart disease?

Alcohol, in low doses, reduces the risk of coronary heart disease (Gunzerath et al. 2004). Objectively defined higher quality studies find less of a protective effect than lower quality studies (Corrao et al. 2000). A review of higher quality studies, found that the risk of coronary heart disease decreased to 80% of the level of non-drinkers at 20 grams (two drinks) of alcohol per day, Figure 4.7. Most of the reduction in risk occurred by the level of one drink every second day. Beyond two drinks a day (the level of alcohol consumption with the lowest risk), the risk of heart disease increases, the risk exceeding that of an abstainer beyond a consumption level of 80g a day.

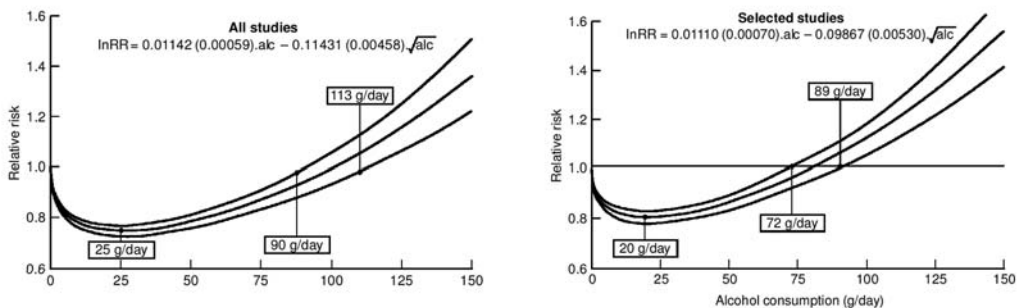


Figure 4.7 Functions (and corresponding 95% confidence intervals) describing the dose-response relationship between reported alcohol consumption and the relative risk of coronary heart disease obtained by pooling all the 51 included studies and the 28 selected cohort studies for which a high quality score was assigned. The fitted models (with standard errors in parentheses) and three critical exposure levels (nadir point, maximum dose showing statistical evidence of protective effect, and minimum dose showing statistical evidence of harmful effect) are reported.

Reproduced from: Corrao et al. (2000).

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The protective effect of alcohol is greater for non-fatal heart attacks than for fatal heart attacks, for men than for women and for people studied in Mediterranean countries than in non-Mediterranean countries. Alcohol's effect in reducing the risk is only relevant to middle aged and older adults, who are at increased risk for heart disease. All of the health benefits of alcohol for the individual drinker are summarized in Box 4.3.

Whereas low doses of alcohol may protect against heart disease, high doses increase the risk, and high volume drinking occasions may precipitate cardiac arrhythmias, myocardial ischaemia or infarction and coronary death (Trevisan et al. 2001a; Trevisan et al. 2001b; Murray et al. 2002; Gmel et al. 2003 Britton & Marmot 2004; Trevisan et al. 2004).

BOX 4.3 Health benefits of alcohol to the individual drinker

	CONDITION	Summary of findings
Social well being	<i>Positive sensations and experiences</i>	Found in general population studies. Influenced by culture, the setting in which drinking occurs, and people's expectations about alcohol's effects.
	<i>Subjective health</i>	Light consumption of wine, but not of beer or spirits, associated with a self-perception of good health, when compared with non-drinkers and heavier drinkers. Uncertain how much of this is due to factors other than alcohol.
Neuropsychiatric conditions	<i>Cognitive functioning and dementia</i>	Light alcohol consumption may reduce the risk for vascular caused dementia, whereas the effects on Alzheimer's disease and cognition remain uncertain, with some studies finding a beneficial effect and others not.
Gastrointestinal, endocrine and metabolic conditions	<i>Gall stones</i>	There is some evidence that alcohol might reduce the risk of gall stones, although this finding is not consistent across all studies.
	<i>Type II diabetes</i>	The relationship with type II diabetes appears to be U-shaped, with low doses decreasing the risk compared with abstainers and higher doses increasing the risk. Not all studies find a decreased risk from lighter drinking.
Cardiovascular diseases	<i>Ischaemic stroke</i>	Many individual studies find that light drinking reduces the risk of ischaemic stroke, although one systematic review combining all studies found no clear evidence of a protective effect.
	<i>Coronary heart disease (CHD)</i>	A meta-analysis of 51 studies and of 28 high quality cohort studies found a 20% decreased risk of CHD at reported consumption levels of 20g/day. The size of the reduction in risk for CHD is both smaller and occurs at a lower level of alcohol consumption in higher quality studies. Although the relationship between alcohol consumption and the risk of CHD is biologically plausible, concern still remains that the effect or at least some of it might be explained by alcohol measurement problems and confounders that have not been adequately controlled in all studies.
Skeletal conditions		There is some evidence that women who consume alcohol in small doses generally have a higher bone mass than do women who abstain.
Total mortality		In older people, compared with people who do not drink, small quantities of alcohol reduce the overall risk of dying. The level of alcohol consumption with the lowest risk for total mortality (nadir) occurs at 4 g per day for women aged 65 years and over and 11 g per day for men aged 65 years and over.

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The relationship between alcohol consumption and the risk of coronary heart disease is biologically plausible and independent of beverage type (Mukamal et al 2003). Alcohol consumption raises levels of high density lipoprotein cholesterol (HDL) (Klatsky 1999). HDL removes fatty deposits in blood vessels and thus is associated with a lower risk of coronary heart disease deaths. Moderate alcohol intake favourably affects blood clotting profiles, reducing the risk of heart disease (McKenzie & Eisenberg 1996; Reeder et al. 1996; Gorinstein et al. 2003; Imhof & Koenig 2003). Alcohol's impact on coagulation mechanisms is likely to be immediate and, since lipid modification in older age groups produce significant benefit, the impact mediated through elevation of HDL cholesterol can probably be achieved by alcohol consumption in middle and older age.

The biochemical changes that might reduce the risk of heart disease result equally from beer, wine or spirits (der Graag et al. 2000) and are due to both polyphenols and ethanol (Gorinstein & Trakhtenberg 2003); although red wine has the highest content of polyphenols, the biochemical changes do not result from grape juice or wine from which the alcohol has been removed (Sierksma 2003). In contrast with these biochemical changes, there is evidence that alcohol consumption, in a dose dependent manner, and heavy episodic drinking increase the risk of calcification of the coronary arteries in young adults (Pletcher et al. 2005), a marker of atherosclerosis that is predictive of future heart disease (Pletcher et al. 2004).

Although the relationship between lower levels of alcohol consumption and reduced risk of coronary heart disease is found in many studies, it is not found in all. A study of a group of employed Scottish men aged over 21 years found no elevated risk for coronary heart disease among abstainers, compared to light and moderate drinkers (Hart et al. 1999). Other studies of the general population, where respondents might be expected to have reduced their drinking due to poor health, have found no differences in death rates between light drinkers and abstainers (Fillmore et al. 1998a, Fillmore et al. 1998b; Leino et al. 1998).

Some studies in England and the United States have found that compared to non-drinkers, light drinkers had generally healthier lifestyles in terms of diet, physical activity and not-smoking (Wannamathee & Shaper 1999; Barefoot et al. 2002) and higher incomes (Hamilton & Hamilton 1997; Zarkin et al. 1998). It has been suggested that this could have explained the apparent increased risk of heart disease in non-drinkers compared with light drinkers. Although not found in a Finnish study (Poikolainen et al. 2005), examples of factors more commonly associated with non-drinking status included being older and non-white, being widowed or never married, having less education and income, lacking access to health care or preventive health services, having co-morbid health conditions such as diabetes and hypertension, having lower levels of mental well-being, being more likely to require medical equipment, having worse general health, and having a higher risk for cardiovascular disease (Naimi et al. 2005). For factors in which there were multiple risk categories, there was a graded relationship between increasing levels of risk and an increased likelihood of being a non-drinker.

An Australian study found that non-drinkers had a range of characteristics known to be associated with anxiety, depression and other facets of ill health, such as low status occupations, poor education, current financial hardship, poor social support and recent stressful life events, as well as increased risk of depression, all of which could explain an increased risk of heart disease amongst non-drinkers compared with light drinkers (Rodgers et al. 2000; Greenfield et al. 2002). One American study found that, whereas alcohol consumption reduced the risk of coronary heart disease in white men, it increased the risk in black men, suggesting that the cardioprotective effect could be explained by consistent confounding of lifestyle characteristics of drinkers (Fuchs et al. 2004).

The British Regional Heart study has confirmed that as alcohol consumption tends to decrease with age, epidemiological studies based on baseline measurement lead to an underestimation of risk (Emberson et al. 2005). Whereas baseline alcohol intake displayed U-shaped relations with cardiovascular disease and all-cause mortality, with light drinkers having the lowest risks and non-drinkers and heavy drinkers having similarly high risks, the nature of these relations changed after adjustment for average intake over the twenty year duration of the study; risks associated with non-drinking were lowered, and risks associated with moderate and heavy drinking increased, Figure 4.8. Regular heavy drinkers had a 74% higher risk of a major coronary event, a 133% higher risk of stroke, and a 127% higher risk of all-cause mortality than did occasional drinkers (these estimates were 8%, 54%, and 44% before adjustment for intake variation).

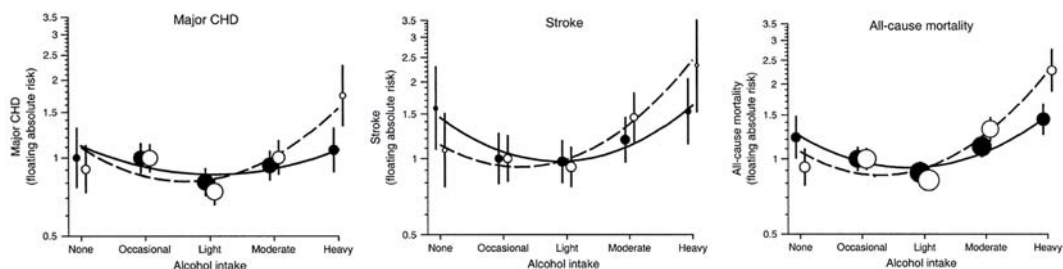


Figure 4.8. Relative hazard of major coronary heart disease (CHD) (coronary death and nonfatal myocardial infarction), stroke, and all cause mortality by alcohol intake, among British Regional Heart Study men originally free from cardiovascular disease followed from 1978/ 1980 to 1998/2000. The black circles and solid line correspond to baseline alcohol intake levels, and the white circles and dashed line correspond to "usual" alcohol intake levels obtained after adjustment for individual variation in alcohol intake. The size of each plotting symbol indicates the amount of statistical information on which each estimate is based. The vertical lines show 95% confidence intervals for the absolute risks. Source: Emberson et al. 2005.

4.4. Is the consumption of alcohol risk free?

The shape of the relationship between alcohol consumption and death depends on both the distribution of the causes of death amongst the population studied, and on the level and patterns of alcohol consumption within the population. At younger ages deaths from traffic accidents and violence (which are increased by alcohol consumption) predominate, while coronary heart disease deaths

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(which are reduced by alcohol consumption) are rare. The position is reversed at older ages. At any given volume of drinking, those drinking higher amounts on a drinking occasion have a higher risk (Tolstrup et al. 2004).

Thus, there is a positive, largely linear relationship between alcohol consumption and risk of death in populations or groups with low coronary heart disease rates (which includes younger people everywhere). On the other hand there is a J or, among older populations, a U shaped relationship between alcohol consumption and risk of death in populations with high rates of coronary heart disease. The exact age when the relationship changes from a linear to a J or U shape depends on the distribution of causes of death, but in European countries occurs an age of death of 50 to 60 years (Rehm & Sempos 1995).

As with coronary heart disease, the level of consumption in the individual associated with the least risk of death varies from country-to-country. Thus, studies from southern and central European countries, with higher consumption levels at least until recently, find the level of consumption associated with the lowest rate of death to be higher (Farchi et al. 1992; Brenner et al. 1997; Keil et al. 1997; Renaud et al. 1998).

In the United Kingdom, it has been estimated that the level of alcohol consumption with the lowest risk of death for women is zero aged under 45 years, 3 g per day aged 45 to 64 years and 4 g per day aged 65 years and over, Figure 4.9.

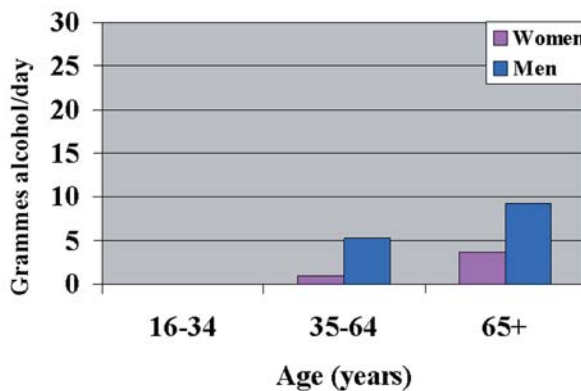


Figure 4.9 Level of alcohol consumption with lowest risk to death.
Source: White et al. 2002.

For men, the levels are zero aged under 35 years, 2.5 g per day aged 35-44 years, 9 g per day aged 45 to 64 years, and 11 g per day aged 65 years and over. Above these levels, the risk of death increases with increasing alcohol consumption (White et al. 2002). For men aged 35 to 69 years at death, the risk of death increases from 1167 per 100,000 at 10 g of alcohol per day to 1431 per 100,000 at 60 or more g per day. For women, the risk increases from

666 per 100,000 at 10 g of alcohol per day to 828 per 100,000 at 60 or more g per day (Thun et al. 1997).

The impact of alcohol and health across the lifespan is summarized in Box 4.4.

4.5 Who is most at risk for alcohol-related ill-health?

Genetic influences

Genetic background influences the risk of alcohol use disorders. The classic twin study design compares the resemblances for a condition of interest between monozygotic (MZ, identical) twins and dizygotic (DZ, fraternal) twins, in order to determine the extent of genetic influence, or heritability, of the condition. Heritability can be calculated because MZ twins are genetically identical, whereas DZ twins share only half their genes. The method relies on the “equal-environment assumption,” that is, that the similarity between the environments of both individuals in a pair of MZ twins is the same as the similarity between the environments of members of pairs of DZ twins, although there is clearly an interaction between genes and the environment (Heath & Nelson 2002).

While twin studies do not identify specific genes influencing a condition, they do provide important information on the condition’s genetic impact (more general properties of its inheritance pattern, such as whether genes act independently of one another, or in concert, to influence a condition), which aspects of the condition are most heritable, whether the same genes are influencing the condition in both genders, and whether multiple conditions share any common genetic influences. When data on twins are augmented by data on their family members, the study is termed a twin/family study and can provide more precise information about whether parents transmit a behavioural condition to their offspring genetically or via some aspect of the familial environment (cultural transmission). When detailed data about the environment are collected, twin and twin/family studies can provide information about how environmental factors interact with genetic predisposition to produce a disease.

Some twin and family studies have suggested the proportion of heritability of alcohol dependence as between 50% and 60% (Cook & Gurling 2001; Dick & Forud 2002; US Department of Health and Human Services 2000). The current literature mostly focuses on alcohol dependence, but there is reason to believe that what is heritable about heavy or problematic drinking reaches more broadly than diagnosable alcohol dependence.

Analyses of 987 people from 105 families in the initial sample of the Collaborative Study on the Genetics of Alcoholism (COGA), a large-scale family study designed to identify genes that affect the risk for alcohol dependence and alcohol-related characteristics and behaviours provided evidence that regions on 3 chromosomes contained genes that increase the risk for alcohol dependence (Reich et al. 1998). The strongest evidence was for regions on chromosomes 1 and 7, with more modest evidence for a region on chromosome 2. The replication sample, which comprised 1,295 people from 157 families, confirmed the previous findings, albeit with less statistical support (Foroud et al. 2000).

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Box 4.4 Alcohol and health across the lifespan					
	Pre-natal	Childhood	Young adulthood	Middle age	Older age
Social consequences			The pleasures from alcohol use occur amongst drinkers		
	The negative social consequences affect all ages.				
			Young adults are common perpetrators and are at particular risk		
Injuries	Intentional and unintentional injuries affect all ages				
			Young adults are common perpetrators of intentional injuries and are at particular risk of both intentional and unintentional injuries		
Neuropsychiatric conditions	The consequences of neuropsychiatric conditions affect all ages				
			Although alcohol dependence affects all adult ages, young adults are at increased risk		
				Middle aged and older people are at increased risk from brain damage and cognitive impairment	
Gastrointestinal conditions			Although liver cirrhosis is more common in middle and older age, young adults are also at risk		
Cancers				Cancers are more likely to occur in middle and older age	
Cardiovascular diseases			Hypertension, stroke and irregularities in heart rhythms can affect all adult ages		
			Heavy episodic drinking is an important risk factor for stroke in young adults		
			Coronary heart disease is rare in young adults		
				The reduced risk for coronary heart disease becomes more important in middle age and older adults	
Pre-natal conditions	The consequences of pre-natal alcohol related harm extend across the lifespan				

A variant of the genes *ADH2* and *ADH3* substantially (although not completely) protects carriers from developing alcohol dependence by making them uncomfortable or ill after drinking alcohol (Reich et al. 1998). The genes encode aldehyde dehydrogenase, one of the two key liver enzymes involved in the metabolism of alcohol to its final end product, acetate. Analyses of non alcohol dependent sibling pairs in the initial sample of the Collaborative Study on the

Genetics of Alcoholism (COGA) produced evidence for a protective region on chromosome 4, in the general vicinity of the alcohol dehydrogenase (*ADH*) genes (Williams et al 1999; Edenberg 2000; Saccone et al. 2000)).

Other risk factors

At any given level of alcohol consumption, women appear to be at increased risk from the chronic harms done by alcohol, with differing sizes of risk with different illnesses. This is probably due to the fact that women have a lower amount of body water per weight than do men (Swift 2003). Thus, when a woman and a man with the same approximate weight and age consume the same amount of alcohol, the alcohol concentration will be higher in the woman, because the alcohol is dissolved in a smaller volume of body water.

Consistently across countries and studies, alcohol-related mortality is highest in adults with lower socio-economic status (Romelsjo & Lundberg, 1996; Leclerc et al. 1990; Lundberg & Osterberg, 1990; Makela et al. 1997; Makela 1999; Loxely et al. 2004). This is primarily due to the higher levels of hazardous drinking and intoxication in groups with lower SES, as the relationship of alcohol consumption and mortality on the individual level is consistent across different levels of education (Schnohr 2004). There is also an interaction between alcohol consumption and poverty in terms of violent crimes such as homicide, with higher rates when these two risk factors are combined than could be expected from the addition of both individual risk factors (Parker 1993). In England, for men aged 25–69 years, those in the lowest socio-economic status (SES) category (unskilled labour) had a 15-fold higher risk of alcohol-related mortality than professionals in the highest SES category in (Harrison & Gardiner 1999). In Sweden, up to 30% of the differential mortality for middle aged men by socioeconomic group is explained by alcohol consumption (Hemström 2001).

Children have greater vulnerability to alcohol than adults. As well as usually being physically smaller, they lack experience of drinking and its effects. They have no context or reference point for assessing or regulating their drinking, and, furthermore, they have built no tolerance to alcohol. From mid-adolescence to early adulthood there are major increases in the amount and frequency of alcohol consumption and alcohol-related problems (Wells et al. 2004; Bonomo et al. 2004). Those with heavier consumption in their mid-teens tend to be those with heavier consumption, alcohol dependence and alcohol related harm, including poorer mental health, poorer education outcome and increased risk of crime in early adulthood (Jefferis et al. 2005). Drinking by adolescents and young adults is associated with automobile crash injury and death, suicide and depression, missed classes and decreased academic performance, loss of memory, blackouts, fighting, property damage, peer criticism and broken friendships, date rape, unprotected sexual intercourse that places people at risk for sexually transmitted diseases, HIV infection and unplanned pregnancy (Williams & Knox 1987).

However, overall, the largest determinant of harmful alcohol use and alcohol use disorders is what the rest of the population is doing (Rose 1992). There is

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a relationship between the overall per capita alcohol consumption and the proportion of heavy drinkers in a population (Skog 1991; Lemmens 2001; Academy of Medical Sciences 2004).

4.6. How important is alcohol as a cause of ill-health?

The World Health Organization's Global Burden of Disease (GBD) Study estimates the contribution that different risk factors, such as alcohol or tobacco, and different diseases and disorders, such as diabetes or alcohol dependence, have in causing ill-health and premature death (Rehm et al 2004). Ill-health and premature death is measured by the disability adjusted life year (DALY), which is a measure of one year of ill-health or premature death. The Global Burden of Disease study finds that alcohol is the third most important risk factor, after smoking and raised blood pressure, for ill-health and premature death in the European Union (Anderson et al. 2005), Figure 4.10. This is a net sum, for which the alcohol-related beneficial effects on disease have already been subtracted. Alcohol use disorders (a measure of alcohol dependence) was the fourth most important disease after heart disease, depression and strokes for European ill-health and premature death. It was more important than chronic lung disease and lung cancer.

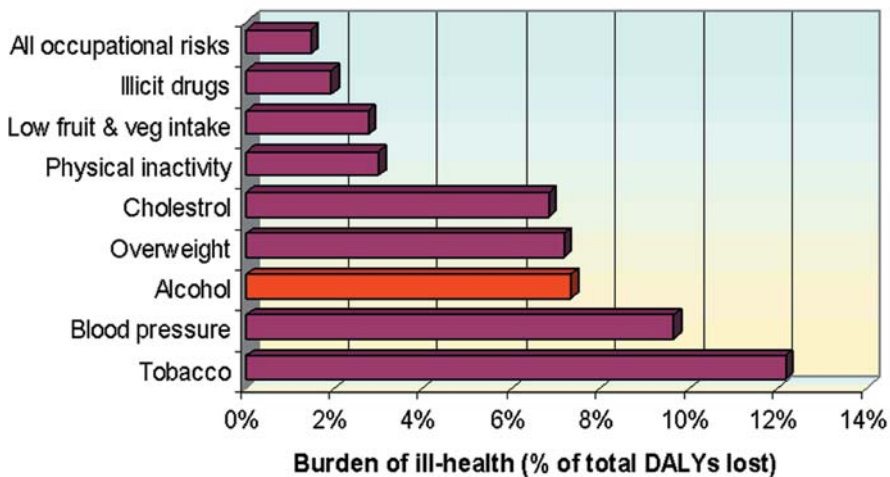


Figure 4.10 Disability adjusted life years by selected risk factors, Europe. Source: Anderson et al. 2005.

Overall, injuries account for the largest portion of the disease burden due to alcohol, with 40% in total, and with unintentional injuries by far outweighing intentional injuries, Figures 4.11. The second largest category is neuropsychiatric diseases and disorders with 38%. Other alcohol- non-communicable diseases (e.g. liver cirrhosis), cancers and cardiovascular disease each contribute 7% to 8% of the total.

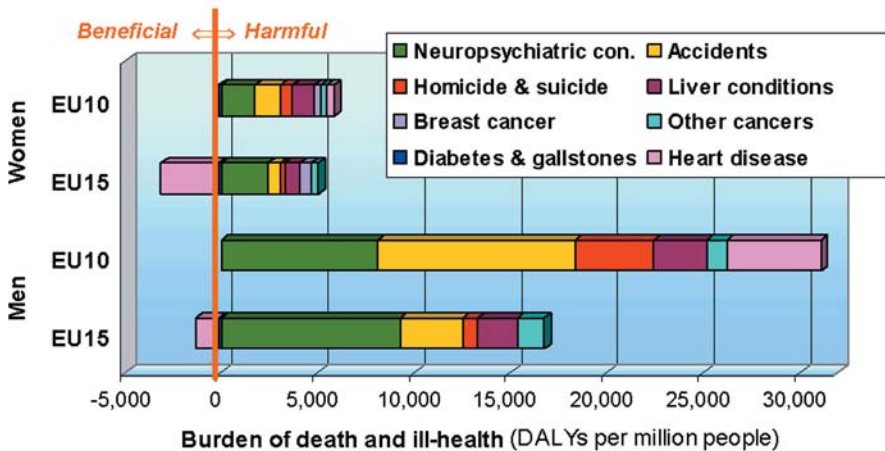


Figure 4.11 Alcohol-attributable burden of death and ill-health in the European Union Adapted from WHO’s Global Burden of Disease study. Source: Anderson et al. 2005.

4.7. Does reducing alcohol use improve health?

There are health benefits from reducing or stopping alcohol consumption. Part of the harm done by alcohol is immediately reversible; all acute risks can be completely reversed if alcohol is removed. Young people who cut down on their drinking as they move into early adulthood reduce their risk of alcohol related harm (Toubmourou et al. 2004).

Chronic diseases often depend on lifetime exposure, and thus risk is often reduced but not completely eliminated by removal of alcohol. On the other hand, there are indications that a reduction of alcohol consumption in populations is associated with a fairly rapid decrease in chronic diseases, such as deaths from liver cirrhosis (Ledermann 1964). For example, time series analyses showed

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that decreases in per capita consumption were associated with considerable concurrent reductions in deaths from liver cirrhosis (e.g. Ramstedt 2001; Skog 1980; and especially Cook & Tauchen 1982). Another example of a chronic condition with rapid, sometimes almost immediate remission is depression. Most studies find that many depressive syndromes markedly improve within days to weeks of abstinence (Brown and Schuckit 1988; Dackis et al. 1986; Davidson 1995; Gibson & Becker 1973, Penick et al. 1988; Pettinati et al. 1982; Willenbring 1986).

Health care based interventions for hazardous and harmful alcohol consumption reduce alcohol consumption, as well as demonstrating reductions in alcohol related problems (Moyer et al. 2002) and alcohol-related mortality (Cuijpers et al. 2004). The community based Malmo study, undertaken during the 1970s, demonstrated that a brief intervention for heavy drinkers resulted in half the deaths that occurred in the control group without the intervention at six year follow-up (Kristenson et al. 1983).

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5. Identifying hazardous and harmful alcohol use

Summary of chapter evidence

1. Should hazardous and harmful alcohol use be identified?

Since alcohol is implicated in a very wide variety of physical and mental health problems in a dose dependent manner, there is an opportunity for all primary health care providers to identify all adult patients with hazardous and harmful alcohol consumption. Numerous studies have shown that most patients with hazardous and harmful alcohol consumption are not known to their health care provider.

2. In which groups of patients should hazardous and harmful alcohol use be identified?

A truly preventive approach can only be reached if all adult patients are screened for hazardous and harmful alcohol consumption, including patterns of episodic heavy drinking. If such an approach is not feasible, limiting screening to high risk groups or to some specific situations may be a feasible option. Such groups could include young to middle aged males and special health clinics (e.g. for hypertension).

3. What are the best questions or screening instruments to identify hazardous and harmful alcohol use?

The simplest questions to use are those that ask about alcohol consumption. The first three questions of the World Health Organization's Alcohol Use Disorders Identification Test, which was designed to identify hazardous and harmful alcohol consumption in primary care settings, have been well tested and validated. The first question asks about frequency of drinking; the second the amount of alcohol consumed on an average drinking day; and the third the frequency of episodic heavy drinking.

4. How should questions or screening instruments be administered?

The identification of hazardous and harmful alcohol consumption works best when it is incorporated into routine clinical practices and systems, such as systematically asking all new patients when they register; all patients when they attend for a health check; or all men aged 18-44 years, when they attend for a consultation. There is no evidence available to suggest that systematic identification of hazardous and harmful alcohol consumption lead to adverse effects, such as discomfort or dissatisfaction amongst patients.

5. Are biochemical tests useful for screening?

Biochemical tests for alcohol use disorders such as liver enzymes (e.g. serum γ -glutamyl transferase (GGT) and the aminotransferases), carbohydrate deficient transferrin (CDT) and mean corpuscular volume (MCV) are not useful for screening because elevated results have poor sensitivity, identifying only a small proportion of patients with hazardous or harmful alcohol consumption.

Recommendations

1. The identification of hazardous and harmful alcohol consumption and episodic heavy drinking should be offered to all adult patients of primary health care facilities.
2. The use of the first three alcohol consumption questions of the AUDIT is one preferred method to identify hazardous and harmful alcohol consumption. Male patients who score 5 or more with the AUDIT-C, or whose alcohol consumption is 280g of alcohol or more per week and female patients who score 4 or more with the AUDIT-C, or whose alcohol consumption is 140g of alcohol or more per week for men should be offered a brief intervention (see Annexe). These cut off points should be adjusted depending on country specific evaluations and guidelines.
3. The identification of hazardous and harmful alcohol consumption works best when it is incorporated into routine clinical practices and systems
4. Biochemical tests, such as serum γ -glutamyl transferase (GGT), carbohydrate deficient transferrin (CDT) and mean corpuscular volume (MCV) should not be relied on for routine screening for hazardous or harmful alcohol consumption or alcohol dependence in primary health care.

5.1. Should hazardous and harmful alcohol use be identified?

Chapter 4 noted that, apart from being a drug of dependence, alcohol is a cause of 60 or so different types of disease and conditions, including injuries, mental and behavioural disorders, gastrointestinal conditions, cancers, cardiovascular diseases, immunological disorders, skeletal diseases, reproductive disorders and pre-natal harm. The chapter found that alcohol increases the risk of these diseases and injuries in a dose dependent manner, with no evidence for a threshold effect. The higher the alcohol consumption, the greater is the risk. Chapter 4 also noted that there are health benefits from reducing or stopping alcohol consumption. All acute risks can be completely reversed if alcohol is removed. Even amongst chronic diseases, such as liver cirrhosis and depression, reducing or stopping alcohol consumption are associated with rapid improvements in health.

Since alcohol is implicated in a very wide variety of physical and mental health problems in a dose dependent manner, there is an opportunity for all primary health care providers to identify all adult patients with hazardous and harmful alcohol consumption. However, although a high proportion of general practitioners state that they screen for alcohol problems (Kaner et al. 1999; McAvoy et al. 1999; Haley et al. 2000; McAvoy et al. 2001; Lopez-de-Munai et al. 2001), actual screening rates are low, (Brotons et al. 1996; Spandorfer et al. 1999; Heather 1996; Gomel et al. 1998; Rumpf et al. 2001) and patients themselves

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report that they rarely get asked about alcohol, even in the case of excessive drinkers (Aalto et al. 2001). Thus, since most patients with hazardous and harmful alcohol consumption are not known to their health care provider (Spandorfer et al. 1999; Vinson et al. 2000; McGlynn et al. 2003; Rush et al 2003), a systematic approach is needed to identify hazardous and harmful alcohol consumption.

5.2. In which groups of patients should hazardous and harmful use be identified?

A truly preventive approach can only be reached if systematic identification is implemented. To propose the implementation of systematic identification of all adult patients may not be feasible in busy general practices. In these cases, to limit identification to high risk groups or to some specific situations may be a feasible option, which should be seen as an intermediate stage in the implementation process. The selection of a high risk group can be made on the basis of the epidemiological evidence (for example, middle aged males) or on the basis of the health risks that alcohol consumption might pose for certain groups (for example, young adults or pregnant women).

A menu of choices includes the following:

1. All patients (by receptionist, nurse or physician): ideal, but not always practical;
2. All patients during certain time periods (for example, one month every 6 months): will identify both hazardous and harmful drinkers, but in limited periods;
3. All new patient registrations: will identify both hazardous and harmful drinkers;
4. For certain age groups (for example younger men): will identify both hazardous and harmful drinkers but other age groups will be missed;
5. For patients with specified symptoms, diagnoses, signs and laboratory test results (see below), or those who attend special clinics (e.g. for hypertension): will mainly catch harmful users and would require a physician in most cases to screen.

Chapter 4 has described the wide range of social and physical harms that can be done by alcohol. Identification of hazardous and harmful alcohol consumption should be undertaken in the presence of any of these harms, including raised blood pressure, headaches, stomach upsets, anxiety and depression, sexual difficulties, sleeping problems, poor concentration, poor work performance, accidental injuries, liver disease, hangovers, cancer, irritability and financial worries. Clinical signs including tremor of the hands, the appearance of blood vessels in the face, and changes observed in the mucous membranes (e.g., conjunctivitis) and oral cavity (e.g., glossitis), hepatomegaly, as well as the smell of alcohol on the breath are also indicators for the identification of hazardous and harmful alcohol consumption. Finally, elevated levels of serum γ -glutamyl

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transferase (GGT) and the aminotransferases, carbohydrate deficient transferrin (CDT) and mean corpuscular volume (MCV) are often due to alcohol. Since these tests are performed routinely as part of a biochemical test battery, the presence of an elevated level should alert the clinician to a possible diagnosis of harmful alcohol consumption.

5.3. What are the best questions or instruments to identify hazardous and harmful alcohol use?

Hazardous and harmful alcohol use can be identified either by measuring alcohol use, or by using a screening instrument specifically designed for the purpose. Alcohol use can be measured using quantity frequency questions or daily estimation methods. These questions and methods can be completed orally, with written questionnaires or with computers.

For a screening instrument, it is important to understand the concepts of *sensitivity* and *specificity*. Sensitivity is the proportion of people with the condition (in this case hazardous or harmful alcohol consumption) who will be identified by the test, while specificity is the proportion of people who do not have hazardous or harmful alcohol consumption that have normal or negative results. These two proportions are interdependent, because one can always improve the sensitivity at the cost of poorer specificity, or vice versa, by changing the cut-off point that defines a normal or abnormal result. For this reason, estimates of test performance quote both sensitivity and specificity, and comparisons are easiest if specificity is set at 95% for all the tests being compared or evaluated. Since the frequency distribution of alcohol intake is continuous, and the harm done by alcohol is largely dose-dependent, although there are expert guidelines on what constitutes hazardous or harmful drinking for a screening test, it is difficult to define who is in the "normal" group and who is in the "abnormal" one. Thus, it is hard to evaluate the absolute sensitivity or specificity of a test. Only the relative performance of different tests can be compared.

5.3.1. Measuring alcohol use

Two methods can be used to measure self-reported alcohol consumption: (1) quantity/frequency (Q/F) questions that require patients to summarize the amount of alcohol they consume and the frequency with which they drink, either for specific time frames (e.g. a week or past month or past year) or in terms of their 'typical' or 'usual' drinking patterns; and (2) retrospective daily estimation procedures, which ask patients to report the amount they drank on each day during a specified time interval, usually the previous week.

Quantity/frequency questions of consumption A major advantage of quantity frequency (Q/F) questions (Figure 5.1) is that they are easy to complete, permitting quick and efficient screening of large samples of patients. Q/F questions are regarded to be valid and reliable and have adequate utility (Grant et al. 1995; Hasin et al. 1997; Dawson 1998a). In general, specific questions (e.g.

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those with a defined time-frame) have been shown to produce more accurate assessments than global questions (e.g. queries about 'usual' or 'typical' behaviour) (Belson, 1981). Q/F questions tend to describe 'the most common' rather than 'average' behaviour (Poikolainen & Karkkainen 1983; Midanik 1991), and there is some evidence that respondents exclude abstinent periods in their responses regarding 'the last 12 months' (Weisner et al . 1999). The limits of recall must be considered in the choice of an assessment time interval. Short reference periods (e.g. 1 week, past 30 days) are recalled more easily; however, they may not be representative of the patient's general drinking pattern. One of the most persistent issues pertaining to the validity of the Q/F method concerns the measurement of within-patient variability in drinking patterns. Variability is more the rule, and regularity the exception, in drinking behaviour; equally important, variability tends to increase with higher average quantities of use (Greenfield 2000). In general, this problem has been tackled by the adoption of the graduated frequency (GF) approach, measures that comprise a series of questions that ask about consumption in terms of graded amounts (e.g. the number or proportion of occasions on which one to two drinks were consumed, three to four drinks, etc.) or thresholds.

Questions	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 or 9	10 or more

Figure 5.1 An example of a quantity frequency questionnaire (the first two questions of the AUDIT, see below).

Source: Babor et al. 2001.

If a patient states that they drink 2-3 times a week, and 5 or 6 drinks on a typical drinking day, then their average consumption is 2.5 times 5.5, equals nearly 14 drinks a week.

Daily estimation methods Daily estimation methods require more resources (e.g. interviewer time and training; specialized equipment) and impose a much greater burden on patients than quantity/frequency measures. Retrospective instruments (e.g. Timeline Followback: Sobell & Sobell 1992, 1995a; Form 90: Miller & Del Boca 1994; Miller 1996) typically give patients a calendar that covers a specified time interval (for example 7 days, or 90 days). Using aided recall techniques, patients are asked to estimate the number of standard drinks (or to describe the content and quantity of drinks consumed) for each day in the period. Most often the task is completed in the context of a personal interview, although there are adaptations available for telephone (e.g. Form 90-T: Miller 1996) and computer- assisted assessment (e.g. Timeline Followback; Sobell & Sobell 1995b).

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The reliability and validity of the basic retrospective daily estimation procedure is well established (e.g. Sobell et al. 1979, 1986; Tonigan et al. 1997). Daily estimation methods tend to produce more valid consumption estimates than do Q/F item questions (e.g. Sobell & Sobell 1995c). Because they rely on aided-recall techniques and involve the retrieval of actual drinking episodes, they have greater face validity than other approaches. They generate information about patterns of drinking. By sampling behaviour over a period of time in which drinking may have been variable, they account for episodes that do not match the 'typical' or 'usual' drinking events that many Q/F questions measure. However, because such methods appear to quantify alcohol use very precisely, there may be a tendency to view the drinking quantities reported in absolute terms, rather than as estimates or approximations of consumption. The validity of retrospective daily estimation procedures is dependent on both interviewer skill and respondent cooperation. As a consequence, adaptations of this approach for self-administration or for telephone interviews may be difficult to implement.

Computer-assisted and Internet assessment The use of computers to either guide or directly administer assessments has become increasingly popular. Such methods include CAPI (computer-assisted personal interviewing), wherein a computer-generated questionnaire is read to the patient by the interviewer, and responses are entered by the interviewer; CASI (computer-assisted self-interviewing), wherein respondents read a computer-generated questionnaire and respond to items on the computer screen, directly entering their own data; and A-CASI, wherein questions are audio-taped and presented orally via headphones, as well on the computer screen. A recent innovation, which is a variation on CASI, involves collecting information via the Internet. There are many obvious advantages to using computers to guide or administer assessments. A-CASI methods, in particular, can reduce literacy requirements for study participants. Finally, computerized assessment technology can be used to improve consumption estimates by providing graphical displays of beverage containers of varying types and sizes to facilitate the conversion of responses to standard drink units (Dawson 1998b). However, computer-assisted assessments have not always resulted in drinking or related problem estimates that differed significantly from those obtained with conventional paper-and-pencil methods (Hallfors et al. 2000; Miller et al. 2002). Web-based assessments tend to have higher response rates than the mail-based assessments (McCabe et al. 2002).

Summary of measuring alcohol use Quantify frequency questionnaires (for example the first two questions of the AUDIT, see below) are the simplest and quickest method to use to identify alcohol consumption. They are valid and reliable and can easily be incorporated in general health questionnaires.

5.3.2 Using screening or identification instruments

There is a range of instruments that can be used to identify hazardous and harmful alcohol consumption, including the Alcohol Use Disorders Identification

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Test (AUDIT) (Babor et al. 2001), a shortened version of AUDIT, the AUDIT C, (Bush et al. 1998), the Fast Alcohol Screening Test (FAST) (Health Development Agency 2002), the Cage (Mayfield et al. 1974), as well as the TWEAK (Russell et al. 1991), the brief MAST (Pokorny et al. 1972), the RAPS (Cherpitel 2000), the five-shot test (Seppa et al. 1998) and the PAT (Smith et al. 1996). In this section, the AUDIT, the AUDIT-C, the FAST and the Cage are reviewed, since they are the more commonly used instruments.

Alcohol Use Disorders Identification test (AUDIT) The AUDIT questionnaire was developed by the World Health Organization to detect at-risk, harmful, or heavy drinking, Figure 5.2. It includes ten questions covering the three domains of hazardous alcohol use, harmful alcohol use, and alcohol dependence Figure 5.3. The AUDIT is easy to score. Each of the questions has a set of responses to choose from, and each response has a score ranging from 0 to 4. All the response scores are added to provide a total score.

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The Alcohol Use Disorders Identification Test: Interview Version Read questions as written. Record answers carefully. Begin the AUDIT by saying "Now I am going to ask you some questions about your use of alcoholic beverages during this past year." Explain what is meant by "alcoholic beverages" by using local examples of beer, wine, vodka, etc. Code answers in terms of "standard drinks". Place the correct answer number in the box at the right.	
1. How often do you have a drink containing alcohol? (0) Never [Skip to Qs 9-10] (1) Monthly or less (2) 2 to 4 times a month (3) 2 to 3 times a week (4) 4 or more times a week <input type="text"/>	6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <input type="text"/>
2. How many drinks containing alcohol do you have on a typical day when you are drinking? (0) 1 or 2 (1) 3 or 4 (2) 5 or 6 (3) 7, 8, or 9 (4) 10 or more <input type="text"/>	7. How often during the last year have you had a feeling of guilt or remorse after drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <input type="text"/>
3. How often do you have six or more drinks on one occasion? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily Skip to Questions 9 and 10 if Total Score for Questions 2 and 3 = 0 <input type="text"/>	8. How often during the last year have you been unable to remember what happened the night before because you had been drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <input type="text"/>
4. How often during the last year have you found that you were not able to stop drinking once you had started? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <input type="text"/>	9. Have you or someone else been injured as a result of your drinking? (0) No (2) Yes, but not in the last year (4) Yes, during the last year <input type="text"/>
5. How often during the last year have you failed to do what was normally expected from you because of drinking? (0) Never (1) Less than monthly (2) Monthly (3) Weekly (4) Daily or almost daily <input type="text"/>	10. Has a relative or friend or a doctor or another health worker been concerned about your drink-ing or suggested you cut down? (0) No (2) Yes, but not in the last year (4) Yes, during the last year <input type="text"/>
Record total of specific items here <input type="text"/> If total is greater than recommended cut-off, consult User's Manual.	

Figure 5.2 AUDIT (Interview version). Source: Babor et al. 2001.

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Domains and Item Content of the AUDIT		
Domains	Question Number	Item Content
Hazardous Alcohol Use	1	Frequency of drinking
	2	Typical quantity
	3	Frequency of heavy drinking
Dependence Symptoms	4	Impaired control over drinking
	5	Increased salience of drinking
	6	Morning drinking
Harmful Alcohol Use	7	Guilt after drinking
	8	Blackouts
	9	Alcohol-related injuries
	10	Others concerned about drinking

Figure 5.3 The different domains of the AUDIT. Source: Babor et al. 2001.

The AUDIT's original evaluation found a sensitivity of 97% and a specificity of 78% for hazardous use and a sensitivity of 95% and a specificity of 85% for harmful use when a cut-off of 8 or more was used (Saunders et al. 1993). Using the same cut-off, but different criterion standards, sensitivities between 51% and 59% and specificities of 91% to 96% for detecting at-risk drinking or heavy drinking have been reported (Volk et al. 1997a; Sillanauke et al. 1998; Bush et al. 1998; Bradley et al. 1998a). When a cut-off of 5 or more was used, a sensitivity of 84% and a specificity of 90% for combined hazardous, harmful, or dependent drinking have been reported (Picinelli et al. 1997).

A variety of subpopulations have been studied, including primary care patients (Volk et al. 1997; Rigmaiden et al. 1995; Piccinelli et al. 1997) emergency room cases (Cherpitel 1995), drug users (Skipsey et al. 1997), the unemployed (Clausen & Aasland 1993), university students (Fleming et al. 1991), elderly hospital patients (Powell & McInness 1994), and persons of low socio-economic status (Isaacson et al. 1994). The AUDIT has been found to provide good discrimination in a variety of settings where these populations are encountered.

Research has been conducted in a wide variety of countries and cultures (Cherpitel 1995; Conigrave et al. 1995a; Volk et al. 1997; Piccinelli et al. 1997; Powell & McInness 1994; Ivis et al. 2000; Lapham et al. 1998; Steinbauer et al. 1998), suggesting that the AUDIT has fulfilled its promise as an international screening test. Although evidence on women is somewhat limited (Cherpitel 1995; Conigrave et al. 1995a; Steinbauer et al. 1998), the AUDIT seems equally appropriate for males and females. The effect of age has not been systematically analyzed as a possible influence on the AUDIT, but one study (Powell & McInness 1994) found low sensitivity but high specificity in patients above age 65 years.

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In comparison to other screening tests, the AUDIT has been found to perform equally well or at a higher degree of accuracy (Allen et al. 1997; Cherpitel 1995; Clements 1998; Hays et al. 1995) across a wide variety of criterion measures. Bohn et al. (1995) found a strong correlation between the AUDIT and the MAST ($r=.88$) for both males and females.

A high correlation coefficient (.78) was also found between the AUDIT and the CAGE in ambulatory care patients (Hays et al 1995). AUDIT scores were found to correlate well with measures of drinking consequences, attitudes toward drinking, vulnerability to alcohol dependence, negative mood states after drinking, and reasons for drinking (Bohn et al. 1995).

Two studies have considered the relation between AUDIT scores and future indicators of alcohol-related problems and more global life functioning. In one study (Clausen & Aasland 1993), the likelihood of remaining unemployed over a two year period was 1.6 times higher for individuals with scores of 8 or more on the AUDIT than for comparable persons with lower scores. In another study (Conigrave et al. 1995b), AUDIT scores of ambulatory care patients predicted future occurrence of a physical disorder, as well as social problems related to drinking. AUDIT scores also predicted health care utilization and future risk of engaging in hazardous drinking (Conigrave et al. 1995b).

Several studies have reported on the reliability of the AUDIT (Fleming et al. 1991; Hays et al. 1995; Sinclair et al. 1992). The results indicate high internal consistency, suggesting that the AUDIT is measuring a single construct in a reliable fashion. A test-retest reliability study (Sinclair et al. 1992) indicated high reliability ($r=.86$) in a sample consisting of non-hazardous drinkers, cocaine users, and people with alcohol dependence. Another methodological study was conducted in part to investigate the effect of question ordering and wording changes on prevalence estimates and internal consistency reliability (Lapham et al. 1998). Changes in question ordering and wording did not affect the AUDIT scores, suggesting that within limits, there can be some flexibility in modifying the order and wording of the AUDIT items.

Seppä et al. (1998) developed the Five-Shot Questionnaire for detecting risky drinking, by combining two items from AUDIT asking about drinking amounts and three items from CAGE that correspond to the three different types of question in the AUDIT (hazardous alcohol consumption, dependence symptoms and harmful alcohol consumption). This instrument was tested in a middle-aged male population and, although it performed better than the CAGE, its usefulness among other age groups, among women and in PHC settings has not been demonstrated.

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The AUDIT-C (Bush et al. 1998; Aertgeerts et al. 2001; Gordon et al. 2001) includes only the three AUDIT alcohol consumption questions. Bush et al. (1998) evaluated the AUDIT-C for harmful alcohol use or dependence and/or risky drinking in a male population. Although the AUDIT-C performed better than the full AUDIT and the CAGE in identifying risky drinkers, this study was restricted to men, performed at three Veterans Affairs (VA) general medical clinics and the interviews were conducted by telephone. Telephone interviews can produce a significant bias in the results (Kraus & Augustin, 2001). Gordon et al. (2001) used the AUDIT-C to identify hazardous drinkers in a large primary health care sample. The AUDIT-C proved to be as effective as the AUDIT, even though criteria for hazardous drinking were not established on the basis of clinical judgement, but using quantity–frequency measures obtained from a self-administered questionnaire. In general, the AUDIT-C has shown a sensitivity of 54 to 98% and a specificity of 57 to 93% for various definitions of heavy drinking (Fiellin et al. 2000a).

In Europe, a large study of alcohol screening questionnaires in primary healthy care carried out in Belgium (Aertgeerts et al. 2001) compared the full AUDIT with two shorter forms (Bush et al. 1998; Gordon et al. 2001) and the 5-shot questionnaire (Seppä et al. 1998). With a focus on alcohol dependence, and not on hazardous or harmful alcohol consumption, the AUDIT-C performed significantly less well than the full AUDIT among female patients, but compared well with other questionnaires.

Gual et al. (2002) compared the AUDIT-C with clinical diagnoses of risky drinking made by study physicians after interviewing patients attending primary health care centres. Correlations between the scores of AUDIT-C, the full AUDIT and alcohol consumption (in standard drinks) were positive and highly significant. AUDIT-C and the full AUDIT performed similarly and had equivalent sensitivities and specificities for detecting risky drinking among men and women attending primary health care centres. Among men, the best cut-off score was 5 (sensitivity 92.4%; specificity 74.3%), and among women, the best cut-off score was 4 (sensitivity 90.9 and specificity 68.4%).

The Fast Alcohol Screening Test, developed in England, comprises four questions, two concerned with alcohol consumption and two concerned with alcohol-related harm, Figure 5.4 (Health Development Agency 2002). Using a cut off score for hazardous alcohol consumption of 3, the FAST has found to have high test-retest reliability, and compared with the full AUDIT, a sensitivity of 93% and a specificity of 88%. It worked equally well in different medical settings (primary care, dental hospital and fracture clinic) and for different age and gender groups (Hodgson et al. 2003).

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For the following questions please circle the answer which best applies.

1 drink = 1/2 pint of beer or 1 glass of wine or 1 single spirits

1. MEN: How often do you have EIGHT or more drinks on one occasion?
WOMEN: How often do you have SIX or more drinks on one occasion?

0 1 2 3 4
Never Less than monthly Monthly Weekly Daily or almost daily

2. How often during the last year have you been unable to remember what happened the night before because you had been drinking?

0 1 2 3 4
Never Less than monthly Monthly Weekly Daily or almost daily

3. How often during the last year have you failed to do what was normally expected of you because of drinking?

0 1 2 3 4
Never Less than monthly Monthly Weekly Daily or almost daily

4. In the last year has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?

0 2 4
No Yes, on one occasion Yes, on more than one occasion

Figure 5.4 The Fast Alcohol Screening Test (FAST). Source: Health Development Agency 2002.

CAGE Questionnaire The CAGE questionnaire has also been evaluated as a screening tool for at-risk, harmful, or hazardous drinkers in primary care. The 4-item CAGE questions had a sensitivity of 84% and a specificity of 95% when a cut-off of 2 or more positive responses was used to detect at-risk drinkers, defined as those who consumed 64 g or more of alcohol per day (King 1986). Using the same criteria for a positive score, the CAGE questionnaire had a sensitivity of 14% and a specificity of 97% for detecting at-risk drinking (according to National Institute of Alcohol Abuse and Alcoholism criteria) among patients older than 60 years (Adams et al. 1996). The CAGE questionnaire had a sensitivity between 49% and 69% and a specificity between 75% and 95% in screening for patients with heavy drinking (Aithal et al. 1998; Bradley et al. 1998b). An augmented CAGE questionnaire, which includes the 4 CAGE questions, the first 2 quantity and frequency questions of the AUDIT, and a question pertaining to history of drinking problems, had a sensitivity of 65% and a specificity of 74% (Bradley et al. 1998b).

Summary of screening or identification instruments Given the wide range of instruments with reasonable sensitivities and specificities, it is difficult to choose one instrument over the other. The AUDIT was specifically designed for use in primary care, but is long and time consuming to use as a quick identification

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instrument. The first three questions of the AUDIT (AUDIT-C), which enquire about alcohol consumption, are perhaps the current best option.

5.4. How should questions or identification instruments be administered?

The AUDIT may be administered either as an oral interview or as a self-report questionnaire. Each method carries its own advantages and disadvantages that must be weighed in light of time and cost constraints. A self-report question takes less time, is easy to administer, is suitable for computer administration and scoring, and may produce more accurate answers. Completion by interview allows clarification of ambiguous answers, can be administered to patients with poor reading skills, and allows seamless feedback to the patient, and the initiation of brief advice.

In most trials of identification and brief interventions, it has been the general practitioner who has been responsible for identification of patients. In some of the countries participating in the Phase III of the 'WHO Collaborative Study on Alcohol and Primary Health Care', AUDIT questionnaires were handed out to patients by the receptionist (Funk et al. 2005). On the other hand, there is an increasing body of evidence for the role of nurses in delivering identification and brief interventions (Owens et al. 2000; Lock et al. 2002; Deehan et al. 1998). In general, it is recommended that both nurses and general practitioners must be involved in the delivery of identification and brief intervention programmes. Each primary health care team should decide different professional responsibilities taking into account the specificities of the health system, the health centre, and the population treated.

Even though patients may be identified for hazardous and harmful alcohol consumption at anytime, there are at least four situations in which identification can be undertaken:

- As part of new patient registration
- As part of a routine intervention
- Before prescribing a medication that interacts with alcohol
- In response to problems that might be alcohol related

Implementing successful identification methods for hazardous and harmful alcohol consumption in primary health care is not an easy task. Some recommendations have been made to optimize results:

- Questions about alcohol use could be incorporated into a general history of lifestyle questions or into a general health questionnaire (questions about exercise, nutrition, smoking and medications).
- Patients at high risk for illicit drug use could be asked about alcohol and other drug use in combination.

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- The physician should adopt a non-confrontational, non-judgmental and empathetic approach when interviewing the patient and when discussing identification results.
- When recording identification results, the physician should indicate that a positive screen is not necessarily a diagnosis.
- The extent and limits of confidentiality must be clearly explained to the patient if a positive score is detected. The charts of patients who screen positive should be flagged, but the reminders should remain neutral, i.e., should not identify the problem being flagged.

The frequency with which the identification of hazardous and harmful alcohol consumption should be undertaken for the same patient is not known. Given that there is evidence that the impact of brief interventions for hazardous and harmful alcohol consumption diminishes after four years (see chapter 6), identification could be repeated every four years, unless there was a clinical reason to undertake identification sooner. The systematic review for the US Preventive Services Task Force found no research that addressed adverse effects associated with systematic identification programmes for alcohol use (Whitlock et al. 2004) (see Chapter 7).

5.5 Are biochemical tests useful for screening?

Biochemical tests for alcohol use disorders include liver enzymes (e.g. serum γ -glutamyl transferase (GGT) and the aminotransferases), carbohydrate deficient transferrin (CDT) and mean corpuscular volume (MCV).

γ -glutamyl transferase (GGT) Serum levels of GGT rise in response to alcohol consumption to a variable extent (Rosalki et al. 1970). GGT levels typically correlate only moderately with alcohol consumption ($r = 0.30$ – 0.40 in men, 0.15 – 0.30 in women) (Sillanaukee et al. 2000), and there is some unpredictability about which drinkers will respond to excessive drinking with an elevation in GGT. GGT does not respond to a single dose of alcohol unless the person has previously been an excessive drinker (Dunbar et al. 1982; Gill et al. 1982; Devgun et al. 1985). GGT levels respond to even low levels of regular drinking (Sillanaukee et al. 2000), but generally sustained excessive drinking is needed to raise a significant proportion of drinkers' levels above laboratory reference ranges. Regular drinking is more likely to increase levels than episodic drinking (Meerkerk et al. 1999) and intensity of drinking (i.e. number of drinks per drinking day) appears to be important. GGT increases more rapidly with resumption of alcohol consumption in those with a history of excessive drinking, and particularly if there has been a past raised GGT (Nemesanszky et al. 1998). While GGT typically begins to fall within the first week of cessation of excessive drinking, the rate of decrease is variable, particularly in the presence of background hepatic impairment.

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GGT is limited as a tool in screening by its relatively poor sensitivity. Only 30–50% (Sillanaukee et al. 2000; Hashimoto et al. 2001; Poikolainen & Vartiainen 1997) of heavy drinkers in the general community or family practice settings have elevated levels (Meerkerk et al 1999), although sometimes the proportion is less than 10% (Lof et al. 1994; Aertgeerts et al. 2001). In these settings specificity varies from 40% up to nearly 90%.

Carbohydrate-deficient transferrin (CDT) CDT has been investigated widely as a biochemical test of heavy alcohol consumption (Salaspuro 1999; Sharpe 2001). Patients consuming 50–80 g of alcohol per day for at least a week will show increased CDT serum levels (Stibler 1991). During abstinence, CDT normalizes with a half-life of 15 days in the majority of patients (Stibler 1991; Allen et al. 2001), but may be shorter (Spies et al. 1995a,b, 1996a,b). Studies show that CDT is much better at detecting chronic heavy drinkers than hazardous drinkers or high current alcohol consumption alone (Sillanaukee et al. 1993; Allen et al. 1994; Gronbaek et al. 1995). CDT also performs better in detecting patients with alcohol dependence than in detecting patients with high alcohol consumption irrespective of dependence (Mikkelsen et al. 1998).

In a recent, population-based screening study of 1863 subjects (WHO/ISBRA Collaborative Study), the sensitivity and specificity of CDT were 60% and 92% in males and 29% and 92% in females, respectively, for levels of verbally reported heavy drinking during the previous month for males of more than 80g alcohol per day and females of more than 40g alcohol per day (Conigrave et al. 2002). Perhaps the greatest benefit of the CDT test is that the percentage of false positives is relatively low (high specificity). However, false positives can occur because of genetic D-variants, CDG syndrome, primary biliary cirrhosis, hepatocellular carcinoma, viral liver cirrhosis and pancreas and kidney transplantation or the drugs used to treat these disorders (Sillanaukee et al. 2001a). There is no information on the value of CDT in predicting morbidity or mortality.

Erythrocyte Mean Cell Volume (MCV) The mean volume of the red blood cell (mean corpuscular volume (MCV) has been recognized for many years as increasing with alcohol consumption (Wu et al. 1974). In heavy drinking, the majority of cases of macrocytosis occur in the presence of normal folate levels (Wu et al. 1974; Maruyama et al. 2001), without anaemia, and do not respond to folate treatment (Wu et al. 1974).

As the life-span of a red blood cell is 120 days, it may take several months for changes in drinking to be reflected in MCV levels (Hasselblatt et al. 2001). Sustained and regular excessive drinking appears to be needed to result in elevated MCV levels in the absence of folate deficiency, liver disease or bleeding. There are no experimental studies demonstrating an increase in MCV with administration of alcohol in healthy volunteers. Regularity of drinking is important (Meerkerk et al. 1999). In alcohol dependence, MCV levels may continue to rise upon cessation of drinking (Monteiro & Masur 1986).

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MCV has limited value as a screening test because of its poor sensitivity, typically below 50%. In one general practice setting MCV detected less than 20% of excessive drinkers (Meerkerk et al. 1999). On the other hand, MCV is more specific than GGT in most populations, with specificities of more than 90% (Meerkerk et al. 1999).

Combinations of biochemical tests The combined use of markers provides more information than a single marker (Conigrave et al. 1995c, Helander et al. 1996; Anton 2001; Sillanaukee & Olsson 2001; Anton et al. 2002; Martin et al. 2002). The degree of overlap is related not only to the amount of alcohol consumed and the severity of liver disease, but may differ according to gender, age (Anton & Moak 1994; Allen et al. 2000; Sharpe 2001; Conigrave et al. 2002), body mass index (Sillanaukee et al. 2001b; Conigrave et al. 2002; Reif et al. 2001), presence of liver disease (Salaspuro 1999), and drinking patterns (Anton et al. 1998). However, there is no simple accepted criteria for interpreting the results from multiple laboratory tests (Rubio et al. 1996; Allen et al. 1997, 2000; Allen & Litten 2001; Hermansson et al. 2000; Harasymiw & Bean 2001; Mundle et al. 2000; Sillanaukee & Olsen 2001; Martin et al. 2002; Sharpe 2001; Fiellin et al. 2000a; Fiellin et al. 2000b; Saunders & Lee 2000; Sharpe 2001; Rehm et al. 2003).

Biochemical tests and gender Differences in reported intensity, frequency and pattern of alcohol drinking between men and women may account for differences in the response of biomarkers (Brienza & Stein 2002; Gentilello et al. 2000; Sillanaukee et al. 2000). Allen et al. (2000) reviewed six studies which compared CDT and GGT in female heavy drinkers and those with alcohol dependence and found comparable sensitivities (52% and 54%, respectively) and good specificities (92% and 96%, respectively). On the other hand, some reports do not consider the use of CDT as valid and useful in women as in men (Nystrom et al. 1992, Anton & Moak 1994; La Grange et al. 1994; Huseby et al. 1997b). For men, CDT levels appeared to respond primarily to frequency of drinking, whereas GGT was influenced primarily by drinking intensity (Whitfield et al. 1978; Allen et al. 2000; Mundle et al. 2000; Sharpe 2001; Whitfield 2001). For women, both CDT and GGT were influenced more by drinks per drinking day (intensity) than by number of days drinking (frequency) (Anton & Moak 1994). In detecting excessive drinking in the early phase, MCV in women was more sensitive (40%) than CDT (29%) or GGT (34%) in a primary care sample (Sillanaukee et al. 1998). Other reports support the usefulness of MCV in women to detect heavy drinking (Martensson et al. 1997; Wetterling et al. 1998a; Allen et al. 2000; Mundle et al. 2000).

Biochemical tests and age Differences in reported intensity, frequency and pattern of alcohol drinking in younger patients compared to older may account for differences in the response of biomarkers. Especially in young people with a more intermittent episodic pattern of hazardous or harmful alcohol use, questionnaires are superior (Allen et al. 1997; Fiellin et al. 2000a; Fiellin et al. 2000b). For CDT, Huseby et al. (1997) reported a sensitivity in a group aged

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between 21 and 35 years (versus 36–50 years) of 17% (versus 57%) and of GGT 8% (versus 43%). The intake in both groups was similar. Many other studies find that in young patients markers of chronic alcohol consumption have a lower sensitivity (Bisson & Milford-Ward 1994; Salaspuro 1999; Sharpe 2001; Conigrave et al. 2002; Gomez et al. 2002). GGT is rarely elevated in subjects under the age of 30 years (Whitfield et al. 1978; Sharpe 2001).

Use of biochemical tests in primary care No biochemical test is sensitive enough to detect chronic drinking between 40g and 60 g/day, although Sillanaukee et al. (2000) demonstrated different thresholds for the association between alcohol consumption and CDT (men 55 g alcohol per week, women 15 g alcohol per week) or GGT (men 74 g/week, women 60 g/week). No marker with adequate accuracy has been found in screening for heavy alcohol consumption in the general population, especially when the rate of young, hazardous non-continuous, low level, binge pattern consumers is considerable (Salaspuro 1999; Sharpe 2001). CDT showed low sensitivities of only 12%–45% or less in populations such as general population and primary care settings (Sharpe 2001). Scouller et al. (2001) concluded, in a meta-analysis of 110 clinical studies, that CDT is no better than GGT in this respect. CDT was little better than GGT in detecting high- or intermediate- risk alcohol consumption in a large, multi-centre, predominantly community-based sample. The sensitivity of MCV to detect heavy drinking is about 40%–50%, but its specificity is high (80%–90%) and very few abstainers and low risk drinkers will have elevated MCV values (Helander et al. 1998; Salaspuro 1999; Helander 2001; Sharpe 2001). In general practice populations questionnaires are superior for screening purposes (Nilssen et al. 1992; Hermansson et al. 2000; Aertgeerts et al. 2001).

Summary of biochemical tests Biochemical tests are not useful for screening because elevated results have poor sensitivity, identifying only a small proportion of patients with hazardous or harmful alcohol consumption. However, elevated levels are often due to alcohol, and, since these tests are performed routinely as part of a biochemical test battery, the presence of an elevated level should alert the clinician to a possible diagnosis of harmful alcohol consumption and alcohol dependence (see Chapter 9).

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6. Effectiveness of brief interventions

Summary of chapter evidence

1. Are brief interventions effective in reducing hazardous and harmful alcohol consumption?

Brief interventions are effective in primary health care settings in reducing hazardous and harmful alcohol consumption. Eight patients need to be advised for one patient to benefit. This compares favourably with brief advice from a general practitioner to cigarette smokers, where about 20 patients need to be offered advice to quit for one to benefit; the ratio improves to about 10 with the addition of pharmacotherapy. There is little evidence for a dose response effect and it does not seem that extended interventions are any more effective than brief interventions. The effectiveness is certainly maintained for up to one year and maybe be maintained for up to four years.

2. Are brief interventions effective in reducing alcohol related problems?

Brief interventions are effective in primary health care settings in reducing alcohol related problems amongst persons with harmful alcohol consumption, but without alcohol dependence. Eight patients need to be advised for one patient to benefit. Brief interventions are also effective in reducing mortality. 282 patients need to receive advice to prevent one death within one year.

3. For which type of patients are brief interventions effective?

Brief interventions appear to be to equally effective for men and women, and for young and old. They appear to be more effective for less serious problems. The evidence to date suggests that interventions during pregnancy are ineffective.

4. What are the components of effectiveness?

Very little is known about the effectiveness of the different components of the intervention. However, based on the contents of evaluated interventions, three essential elements of advice have been proposed, including feedback, the giving of advice and goal setting. There is mixed evidence to suggest interventions with more than one session are any more effective than one session alone. Motivational interviewing appears to be an effective intervention technique.

Recommendations

1. Primary health care physicians and other primary health care professionals should offer at least a very brief (5 minute) intervention to all patients identified with hazardous or harmful alcohol consumption.
2. Effective interventions to reduce hazardous and harmful alcohol consumption consist of not much more than simple but structured advice to the drinker, taking no more than a few (5) minutes to deliver. Somewhat more intensive brief interventions include an initial counselling session of about 15 minutes, feedback, advice, and goal-setting. Most also include further assistance and follow-up. Interventions can be described with reference to the 5-As behavioural counselling framework: assess alcohol consumption with a brief screening tool followed by clinical assessment as needed; advise patients to reduce alcohol consumption to moderate levels; agree on individual goals for reducing alcohol use or abstinence (if indicated); assist patients with acquiring the motivations, self-help skills, or supports needed for behaviour change; and arrange follow-up support and repeated counselling, including referring dependent drinkers for specialty treatment (US Preventive Services Task Force 2004).

6.1 Are brief interventions effective in reducing hazardous and harmful alcohol consumption?

A challenge in summarizing the research literature on the effects of brief interventions stems from varying definitions of such interventions used in different studies. As the term suggests, one defining characteristic of brief interventions is their length. For example, Babor & Grant (1994) termed one contact as 'minimal', one to three sessions as 'brief', five to seven sessions as 'moderate' and eight or more sessions as 'intensive' treatment. However, what is considered a 'brief' intervention in one study might be considered an 'extended' intervention in another. Other features sometimes used to characterize brief interventions include: (1) having a goal of reduced or non-hazardous or harmful drinking as opposed to abstinence; (2) being delivered by a primary health care physician or other health-care professional as opposed to an addiction specialist; and (3) being directed at non-dependent drinkers as opposed to dependent drinkers.

Heather (1995; 1996) has argued that two broad types of brief interventions should be considered separately. The first type, 'opportunistic brief interventions', is made up of interventions typically designed for and evaluated among individuals not seeking help for alcohol problems who are identified by opportunistic screening in primary health care settings. Such individuals often have less severe alcohol problems and lower motivation for change. These interventions are typically shorter, less structured, less theoretically based and delivered by a non-specialist.

6. Effectiveness of brief intervention

These interventions will be referred to as “brief interventions”. The second type, ‘specialist brief interventions’, which originated as a control condition in evaluations of traditional treatment has typically been evaluated among individuals seeking or being persuaded to seek treatment for alcohol-related problems. These interventions are usually longer, more structured, theoretically based and delivered by a specialist. These interventions will be referred to as “less intensive treatment”.

Heather (1989) also noted that evidence regarding the effectiveness of these two types of brief interventions stems from different research designs. Studies examining opportunistic or primary health care brief interventions typically compare them to a no-treatment control condition, whereas studies examining specialist brief interventions typically compare them to traditional, more extended treatments. For such comparisons of brief interventions with traditional treatment, a difficulty has been ‘proving the null hypothesis’ (Heather 1989), as the absence of statistically significant differences does not necessarily prove equal efficacy (Mattick & Jarvis 1994), especially with small sample sizes.

There is also a need to distinguish between two levels of activity within the class of brief interventions. This includes very brief (or “minimal”) interventions consisting of not much more than simple but structured advice to the drinker, taking no more than a few (five) minutes to deliver (this can be termed simple advice), and somewhat more intensive brief interventions, taking perhaps 20-30 minutes to deliver and often involving a few repeat sessions (this can be termed brief counselling).

The Mesa Grande study, an ongoing updated systematic review of the effectiveness of different treatments for hazardous and harmful alcohol consumption, which ranks the effectiveness of 48 different treatment modalities, found that brief interventions head the list of evidence-based treatment methods, in terms of positive findings from a relatively large number of high quality studies conducted (Miller & Wilbourne 2002) (see Table 9.1, Chapter 9).

There have been at least 14 meta-analyses and/or systematic reviews, using somewhat different aims and methods, of research on effectiveness of brief interventions (Bien, Tonigan & Miller, 1993; Freemantle et al., 1993; Kahan et al. 1995; Wilk et al 1997; Poikolainen, 1999; Irvin et al 2000; Moyer et al. 2002; D’Onofrio & Degutis 2002; Berglund et al 2003; Emmen et al. 2004; Ballesteros et al., 2004a; Whitlock et al. 2004; Cuijpers et al 2004; Bertholet et al. 2005). All these have reached conclusions, in one form or another, favouring the effectiveness of brief interventions in reducing alcohol consumption to low-risk levels among hazardous and harmful drinkers.

In the meta-analysis by Moyer et al. (2002) the target population (care-seekers and non-seekers) and the intensity of brief intervention (control condition, brief or extended intervention) were taken into account. A pooled estimate was calculated combining the heterogeneous effect sizes of the individual studies.

6. Effectiveness of brief intervention

For non-treatment seeking populations, comparing brief interventions, as defined as those providing no more than four intervention sessions, to control conditions the review found significant effect sizes in changes in alcohol consumption of 0.26 (95%CI, 0.20-0.32) (Table 6.1 and Figure 6.1; reproduced from Moyer et al. 2002). An effect size of 0.26 is equivalent to a 13% improvement of the intervention group compared with the control group, and of 0.24 of a 12% improvement.

Table 6.1 Aggregate effect sizes for brief interventions versus control conditions in non-treatment seeking samples.

Outcome	Number of samples	Effect size ^a	95% confidence interval	Heterogeneity		
				Q	df	p
<i>Composite of all drinking-related outcomes</i>						
≥3 months	4	0.300**	0.082, 0.518	4.5	3	0.211
>3–6 months	11	0.144***	0.081, 0.206	10.6	10	0.391
>6–12 months	23	0.241***	0.184, 0.299	30.6	22	0.105
>12 months	5	0.129	-0.007, 0.060	7.4	4	0.188
<i>Alcohol consumption</i>						
≥ 3 months	3	0.669***	0.392, 0.945	3.6	2	0.164
>3–6 months	11	0.160***	0.098, 0.222	18.5	10	0.048
>6–12 months	20	0.263***	0.203, 0.323	50.8	19	0.000
>12 months	2	0.202	-0.008, 0.412	0.8	1	0.381
^a Positive values for effect sizes indicate better outcome for brief intervention conditions compared to control conditions.						
** $P < 0.01$;						
*** $P < 0.001$.						

Reproduced from: Moyer et al. (2002).

6. Effectiveness of brief intervention

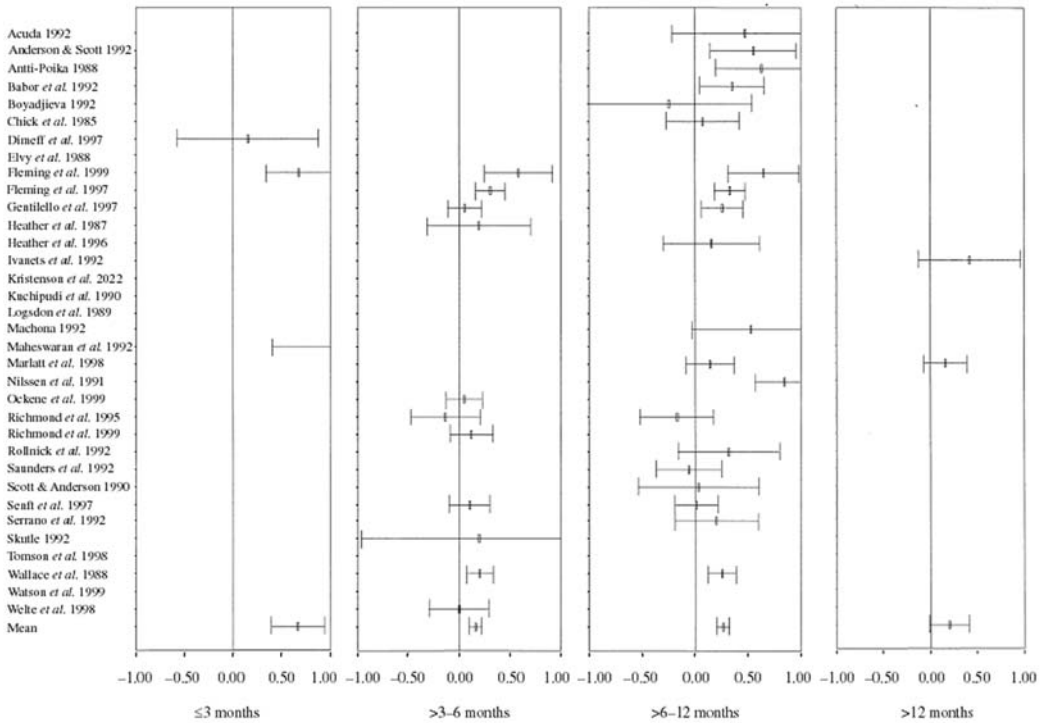


Figure 6.1 Effect sizes and 95% confidence intervals for brief interventions versus control conditions, alcohol consumption.

Reproduced from: Moyer et al. (2002).

Other evidence-based reviews have found brief interventions to be effective. A Swedish Technology Assessment review (Berglund et al. 2003) concluded: "In most of the studies (of brief intervention for secondary prevention) a significant effect of brief intervention has been shown in follow-ups for up to 2 years. The treatment effect is of the same magnitude as that achieved with many common medical treatments for chronic conditions". An Australian systematic review (Shand et al. 2003a) concluded that "opportunistic brief interventions are effective in reducing alcohol consumption in problem drinkers with low levels of dependence".

Longer term effects of brief interventions

Two studies have reported the longer-term effects of brief interventions in primary health care. The study by Fleming et al. (2002) reported a 48 month efficacy and benefit-cost analysis of Project TrEAT (Trial for Early Alcohol Treatment), a randomized controlled trial of brief physician advice for the treatment of problem drinking. Subjects in the treatment group exhibited significant reductions in 7-day alcohol use, number of binge drinking episodes, and frequency of excessive drinking as compared with the control group. The effect occurred within 6 months of the intervention and was maintained over the 48-month follow-up period. The treatment sample also experienced fewer days of hospitalization and fewer emergency department visits.

The study by Wutzke et al. (2002) reported the 10 year follow-up of brief and early interventions for hazardous and harmful alcohol consumption. The effectiveness of three forms of intervention, ranging from five to 60 minutes in duration, was compared with a no treatment control condition. Whereas there was an intervention effect at nine months follow-up, no such effect was found at 10 years follow-up, in median consumption, mean reduction in consumption from baseline to follow-up, mortality and ICD 10 diagnoses of alcohol dependence or harmful alcohol use. Between baseline and the nine month follow-up, the intervention groups reduced their median alcohol consumption from 324 to 208 grams per week, a reduction of 116 grams or 36%, compared with the control group which reduced its median alcohol consumption from 309 to 263 grams per week, a reduction of 46 grams, or 15%. At ten year follow-up, the reduction for the intervention group was from 324 to 174 grams per week, 150 grams, or 46% and the control group from 309 to 158, 151 grams, or 49%. To enhance the effectiveness of brief interventions over the long term, health-care providers might need to provide ongoing monitoring of patients' drinking behaviour and intervene appropriately if drinking again becomes hazardous (Stout et al. 1999).

Brief interventions in primary health care

Five systematic reviews with meta-analysis specifically focused on the effectiveness of brief interventions in primary health care (Kahan et al. 1995; Poikolainen, 1999; Ballesteros et al. 2004a; Whitlock et al. 2004; Bertholet et al. 2005) concluded that brief interventions delivered in primary care settings are effective.

The most recent of these (Bertholet et al. 2005) concluded that brief intervention is effective in reducing consumption among both men and women at six and twelve months following intervention. This review was confined to studies carried out in more naturalistic conditions of primary health care, excluding those studies that used patient lists, registers or specially-arranged screening sessions, and is therefore more relevant to real-world conditions of general practice than other reviews.

The effect size of brief interventions is more understandable in terms of Number Needed to Treat (NNT: the number of hazardous or harmful drinkers that need to receive brief intervention for one to reduce drinking to low-risk levels). The latest estimate of NNT for brief interventions is about 8 (Moyer et al. 2002). This compares favourably with NNT for advice to quit smoking which has an NNT of 20, although this improves to about 10 with the addition of nicotine replacement therapy (Silagy & Stead 2003). In a sense, NNT underestimates the full effectiveness of brief intervention since, even if the drinker does not immediately reduce drinking, it may initiate the beginnings of change, which later becomes an active effort to cut down – or, in other words, the beginning of a movement along the cycle of change (Prochaska & DiClemente 1986).

6. Effectiveness of brief intervention

Brief interventions in other settings

There is limited evidence on the effectiveness of brief interventions in general hospital settings (Emmen et al 2004), but stronger evidence for effectiveness in accident and emergency departments (Monti et al. 1999; Gentilello et al. 1999; Longabaugh et al 2001; D'Onofrio & Degutis 2002; Crawford et al. 2004; Smith et al. 2003) and educational institutions (Baer et al. 1992; Marlatt et al., 1998; Baer et al. 2001; Borsari & Carey 2000; McCambridge & Strang 2004). There is also emerging evidence for the effectiveness for web-based screening and brief interventions (Kypri et al. 2004).

6.2 Are brief interventions effective in reducing alcohol related problems?

For non-treatment seeking populations, comparing brief interventions, as defined as those providing no more than four intervention sessions, to control conditions the review by Moyer et al. (2002) found significant effect sizes in changes of alcohol-related problems of 0.24 (95%CI, 0.18-0.30) at 6-12 months follow-up (Table 6.1, Figure 6.2; reproduced from Moyer et al. 2002). An effect size of 0.26 is equivalent to a 13% improvement of the intervention group compared with the control group, and of 0.24 of a 12% improvement.

There is direct evidence from an Australian study in general practice that brief interventions are effective in reducing alcohol-related problems among those who receive them (Richmond et al. 1995).

Brief interventions save lives. Compared with a control group, brief interventions can prevent one in three deaths that occur amongst problem drinkers (Cuijpers et al. 2004). On average, 282 patients need to receive advice to prevent one death within one year. Such a reduction in death is sizeable and indicates that failure to implement brief interventions will result in preventable deaths.

6. Effectiveness of brief intervention

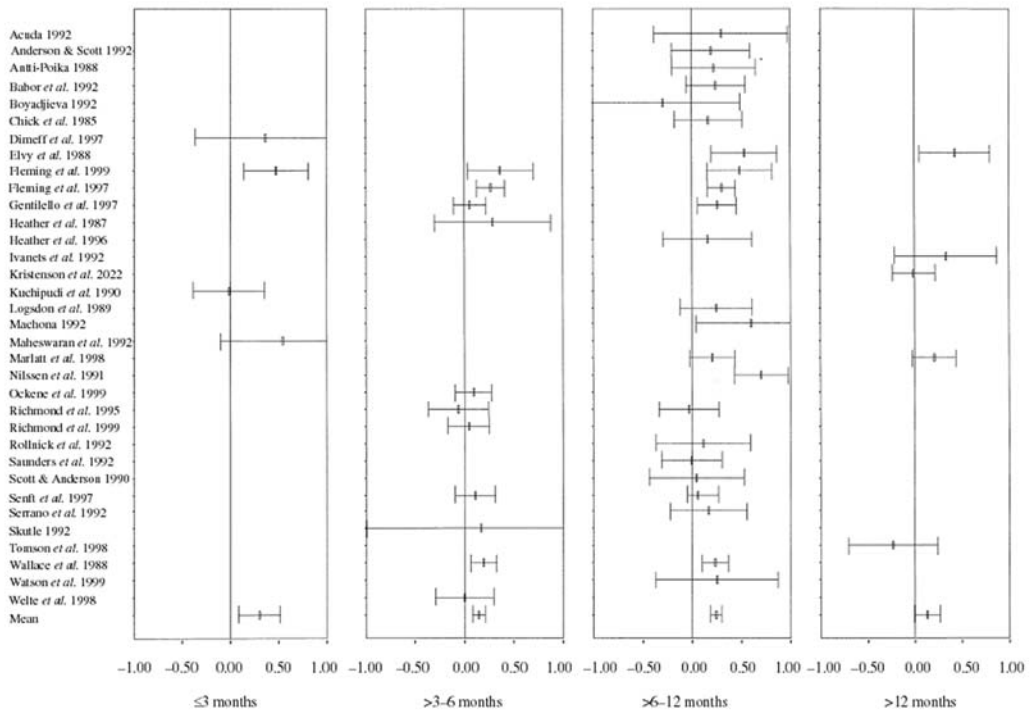


Figure 6.2 Effect sizes and 95% confidence intervals for brief interventions versus control conditions, alcohol problems.

Reproduced from: Moyer et al. (2002).

6.3 For which type of patients are brief interventions effective?

Most of the studies that have demonstrated effectiveness have studied populations of drinkers that have not been seeking treatment for alcohol and have used cut off levels for advice of about 350g alcohol a week for men and 210g for women (Moyer et al. 2002).

Gender

Subgroup analyses in the meta-analysis by Wilk et al. (1997) showed trends for a greater likelihood of moderate drinking following interventions for females versus males, although this was not statistically significant.

Poikolainen (1999) took into account different exposures (brief and extended interventions) and assessed two outcome measures, alcohol consumption and serum glutamyltransferase in the seven studies which he included. One significant homogeneous effect favoured extended brief interventions for alcohol consumption in female samples (-51 grams/week), but it was based on the results of only two studies.

6. Effectiveness of brief intervention

In the meta-analysis by Moyer et al. (2002), and in the review for the US Preventive Services Task Force (Whitlock et al. 2004), men and women appeared to benefit equally from brief interventions.

Ballesteros et al. (2004b) published a meta-analysis of brief interventions in primary care focusing on the effectiveness by gender. Seven studies were included and the standardized effect sizes for the reduction of alcohol consumption were similar in men and in women as were the odds ratios of the frequency of individuals who drank below harmful levels (four studies OR for men 2.32; 95% CI = 1.78-2.93 and odds ratios for women 2.31; 95% CI = 1.60-3.17).

Age

Trials have demonstrated the efficacy of brief interventions designed to reduce the harmful consequences of heavy drinking among high-risk college students (Marlatt et al. 1998) and among alcohol-positive 18- and 19-year-old emergency room patients (Monti et al. 1999). While the primary focus of both of these interventions was reduction of harm associated with heavy alcohol use, reductions in drinking also occurred. In the emergency room study, 18–19-year-olds who presented to an emergency department following an alcohol-related event were randomized to one session of motivational interviewing versus usual care. At 6-month follow-up, those who had received the motivational interview had a significantly lower incidence of drinking and driving, traffic violations and alcohol-related problems and injuries than those in standard care (Monti et al. 1999). A second study on younger (13– 17-year-old) adolescents also recruited from the emergency department and randomized to the same two treatment conditions found that while those who were already motivated to change their drinking showed no differential benefit of motivational interviewing, teens with lower motivation to change at baseline prior to intervention showed significantly greater benefit in reductions in drinking and driving (Monti et al. 2001).

Fleming and colleagues (1999) studied the impact of brief physician advice for hazardous and harmful alcohol use amongst drinkers aged 65 years and older, and found a significant effect.

Pregnancy

Of three good-quality behavioural counselling interventions in primary care settings that targeted pregnant women making prenatal visits, two found no evidence for an effect on alcohol consumption (Handmaker et al. 1999; Chang et al. 1999) and one a possible effect which just failed to reach statistical significance (Reynolds et al. 1995).

Severity of problems

In the meta-analysis by Moyer et al. (2002), brief interventions appeared to be more effective compared to control conditions in studies where more severely affected individuals are excluded. This finding suggests that such interventions might be useful only for individuals with less severe drinking problems.

The Phase II trial of the World Health Organization found that, although there was no difference between simple advice and more extended counselling, simple advice worked best for male patients who had experienced a recent alcohol-related problem, while brief counselling worked better for those who did not have a recent problem (Babor & Grant 1992).

Brief interventions appear to work equally effectively in reducing harmful patterns of drinking as well as overall harmful consumption (Beich et al. 2003; Whitlock et al. 2004).

6.4 What are the components of effectiveness?

All interventions that showed statistically significant improvements in alcohol outcomes of any intensity included at least 2 of 3 key elements— feedback, advice, and goal-setting. Since most effective interventions were multi-contact ones, they also provided further assistance and follow-up. A few also reported tailoring intervention elements to each participant (Whitlock et al. 2004).

Length of sessions

The WHO clinical trial of brief intervention in primary health care (Babor & Grant, 1992) involving 10 countries and 1655 heavy drinkers recruited from a combination of various, mostly medical settings found that, among males, a brief intervention consisting of 5 minutes simple advice based on 20 minutes of structured assessment was as effective in reducing alcohol consumption, with concomitant improvements in health as more extended (15 minutes) counselling. The basic 5 minutes of advice can be used by busy physicians or other health care workers who would not have time for a more prolonged intervention. The 20 minutes of assessment that preceded the WHO intervention can be replaced by the results of screening tests and the clinician's knowledge of the person.

Number of sessions

Subgroup analyses in the meta-analysis by Wilks et al. (1997) showed trends for a greater likelihood of moderate drinking following interventions with more than one session versus just one session, although this was not statistically significant.

Poikolainen (1999) took into account different exposures (brief and extended interventions) and assessed two outcome measures, e.g. alcohol consumption and serum glutamyltransferase in the seven studies which he included. The findings indicated that very brief (5-20min) interventions had significant effect sizes relative to control conditions for alcohol consumption (-70 grams per week) and gammaglutamyltransferase activity (-9.4 U/L), but estimates were not homogeneous. Extended (several visits) brief interventions had significant effect sizes for alcohol consumption (-65 grams/week) but not for GGT activity, and the effect sizes for both outcomes lacked statistical homogeneity.

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In the meta-analysis by Ballesteros et al. (2004a) no evidence of a dose effect relationship was found.

In the Swedish Council of Technology Assessment Health Care's systematic review of all randomized controlled trials (Berglund et al. 2003), the effect sizes for brief intervention studies in primary care were analyzed for single and repeated interventions (Berglund 2005). The single-session studies had an average effect size of 0.19 with negative heterogeneity ($Q = 1.96, P = 0.58$) and the repeated-session studies had an average effect size of 0.61 (random model) with positive heterogeneity ($Q = 72.10, P < 0.001$). The effect sizes of single versus repeated intervention sessions differed significantly ($P < 0.001$). Studies on only one session displayed a robust and stable effect, whereas studies with several sessions generally showed higher effect sizes, but the outcomes were strikingly heterogeneous in contrast to the single-session studies. Some studies with several sessions demonstrate large effect sizes, whereas others do not. It seems that further work is needed to specify factors contributing and not contributing to the probable additive effects of a second session.

Motivational interviewing

It has been proposed that motivational interviewing, originally developed to prepare people to change substance use behaviours (Miller 1983), a directive, client-centred style of counselling that helps clients to explore and resolve their ambivalence about changing behaviours (Rollnick & Miller 1995) might enhance the effectiveness and cost effectiveness of brief interventions. While using client centred techniques to build trust and reduce resistance, the provider focuses on increasing readiness for change (Prochaska & DiClemente 1986), understanding the client's view accurately, avoiding or de-escalating resistance and increasing clients' self-efficacy and their perceived discrepancy between their actual and ideal behaviour (Miller & Rollnick 1991).

The Mesa Grande study (see Chapter 9) shows that the category of Motivational Enhancement occupies second place. Whilst five systematic reviews of research on the effectiveness of motivational interviewing (MI) for a range of addictive disorders (Noonan & Myers 1997; Dunn et al. 2001; Burke et al. 2002; Burke et al. 2003; Burke et al. 2004; Tevyaw & Monti 2004) have provided substantial evidence that motivational interviewing is an effective intervention, it is little understood how it works, for whom it works best or whether or not it is superior to other intervention methods. An additional meta-analysis of 72 clinical trials of motivational interviewing found a significant effect for motivational interviewing, which, when compared with a control group diminished over time (Hetteemaet al. in press). In most studies, the behaviour change observed after motivational interviewing was largely maintained across a year of follow-up, but the comparison group caught up with the intervention group over time, resulting in a gradual diminution of the effect between the treatment and control groups over time. This is not unique to motivational interviewing, but is a common finding with other interventions. In behavioural trials, control groups tend to get better over time.

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7. Costs and cost effectiveness of brief interventions

Summary of chapter evidence

7.1. What are the costs of identification and brief intervention programmes?

It has been estimated that for every 1,000 patients cared for by a general practitioner, it would cost €1644 a year on average throughout the European Union to set up and maintain an identification and brief intervention programme. There is no evidence available to suggest that identification and brief interventions lead to adverse effects, such as discomfort or dissatisfaction amongst patients. The contrary seems to be the case, since discussing alcohol with primary health care professionals is generally well-received by patients.

7.2. What are the benefits of identification and brief intervention programmes?

Screening and brief intervention programmes lead to reductions in hazardous and harmful alcohol consumption, reductions in the harm done by alcohol, and reductions in deaths. A very conservative estimate found that for one adult patient to benefit 385 need to be screened, much more efficient than screening for hypertension (1250) or for colorectal cancer (3300). Eight patients with hazardous and harmful alcohol consumption need to be advised for one patient to benefit, twice as efficient as brief advice for smoking cessation. 282 patients need to receive advice to prevent one death within one year, an enormous gain. The World Health Organization has estimated that brief physician advice with 25% coverage would save 91 years of ill-health and premature death per 100,000 population, 9% of all ill-health and premature death caused by alcohol.

7.3. What is the cost effectiveness of brief interventions?

At a cost of €1960 per year of ill-health and premature death prevented, primary health care brief interventions for hazardous and harmful alcohol consumption are amongst the cheapest of all medical interventions that lead to health gain. In other words, if a primary health care provider is going to undertake a new activity, giving brief advice to patients with hazardous and harmful alcohol consumption will give one of the best health benefits for the practice population than spending ten minutes doing anything else.

Recommendations

1. Within primary health care activity and within the alcohol treatment field, there should be an urgent reorientation of resources to deliver identification and brief intervention programmes for hazardous and harmful alcohol consumption.

7. Costs and cost effectiveness of brief interventions

7.1 What are the costs of identification and brief intervention programmes?

The World Health Organization has estimated the cost and impact of different policy measures in preventing ill health and premature death as measured by Disability Adjusted Life Years (DALYs) resulting from hazardous and harmful alcohol consumption in European countries (Chisholm et al. 2004). Hazardous and harmful alcohol consumption was defined as an average rate of consumption of more than 20g pure alcohol daily for women and more than 40g daily for men (English et al. 1995; Babor et al. 2003). The Disability adjusted life year (DALY) is a summary measure of population health that combines information on mortality and non-fatal health outcomes. It measures a gap in health between the current position and what could be achieved. Health status is adjusted on a scale that ranges from zero (for a state equivalent to death) to unity (for a state of ideal health), based on surveys on health in more than 60 countries.

It has been estimated that for every 1,000 patients cared for by a general practitioner, it would cost €1,644 a year on average throughout the European Union to set up and maintain an identification and brief intervention programme, a total cost to the Union of some €740 million.

It is important not only to consider the financial cost of implementing identification and brief intervention programmes, but also the potential costs to patients in terms of discomfort or dissatisfaction. The systematic review for the US Preventive Services Task Force found no research that addressed adverse effects associated with identification and behavioural counselling interventions for alcohol use (Whitlock et al. 2004). Three good-quality intervention trials reported greater dropout rates among participants receiving alcohol interventions than among controls (Curry et al. 2003; Wallace et al. 1998; Senft et al. 1997), while one good-quality trial reported higher dropout among controls (Anderson & Scott 1992). Differential dropout rates did not affect outcomes since they were addressed analytically; however, dropout may indicate discomfort or dissatisfaction with the intervention, among other plausible explanations. These findings occurred in a minority of trials and cannot be explained with the available data.

While denial and resistance are sometimes encountered from persons with alcohol dependence, harmful and hazardous drinkers are rarely uncooperative. On the contrary, the experience gained from numerous research studies and clinical programs indicates that almost all patients are cooperative, and most are appreciative when health workers show an interest in the relationship between alcohol and health. In general, patients perceive alcohol screening and brief counselling as part of the health worker's role, and rarely object when it is conducted according to the procedures described in these guidelines.

7.2 What are the benefits of identification and brief intervention programmes?

Screening and brief intervention programmes lead to reductions in hazardous and harmful alcohol consumption, reductions in the harm done by alcohol, and reductions in deaths. A very conservative estimate found that for one adult patient to benefit 385 need to be screened (Beich et al. 2003), much more efficient than screening for hypertension (1,250) (SHEP Cooperative Research Group 1991) or for colorectal cancer (3,300) (Mandel et al 1993). Eight patients with hazardous and harmful alcohol consumption need to be advised for one patient to benefit (Beich et al. 2003), twice as efficient as brief advice for smoking cessation (Silagy & Stead 2003).

Brief interventions also save lives. Compared with a control group, brief interventions can prevent one in three deaths that occur amongst problem drinkers (Cuijpers et al. 2004). On average, 282 patients need to receive advice to prevent one death within one year. Such a reduction in death is sizeable and indicates that failure to implement identification and brief intervention programmes will result in preventable deaths.

In the World Health Organization's estimates of the costs and impact of different policy measures in preventing ill health and premature death as measured by Disability Adjusted Life Years (DALYs) resulting from hazardous and harmful alcohol consumption, brief interventions were defined as physician advice provided in primary health care, involving a small number of education sessions and psychosocial counselling. Efficacy estimates were a 22% net reduction in consumption among hazardous drinkers (Higgins-Biddle & Babor, 1996; Moyer et al. 2002; Babor et al. 2003), which would have the effect of shifting the entire distribution of hazardous drinking downwards if applied to the total population at risk (a reduction in overall prevalence of 35-50%, equivalent to a 14-18% improvement over no advice at all). However, after taking into account real-world effect modifiers including adherence to advice (70%) and target coverage in the population (25% of hazardous drinkers), population-level improvement rates were estimated to be between 4.9-6.4% better than natural history rates. In addition, an expected reduction in the number of heaviest drinkers whilst receiving advice (but prior to final improvement) resulted in a small gain in the average level of disability (an improvement of 1.3% after adjusting for coverage and adherence).

If implemented throughout the European Union, it is estimated that a brief intervention programme reaching 25% of the at risk population could prevent between 512 (EuroB countries) and 1,056 (EuroC countries) DALYs per million people per year, at a cost of between €26 (EuroB countries) and €185 (EuroA countries) per 100 people per year, with less of an impact than current taxation with a 25% tax increase, but more than the introduction of random breath testing, restricting sales of alcohol and banning advertising, Figure 7.1 and Box 7.1.

7. Costs and cost effectiveness of brief interventions

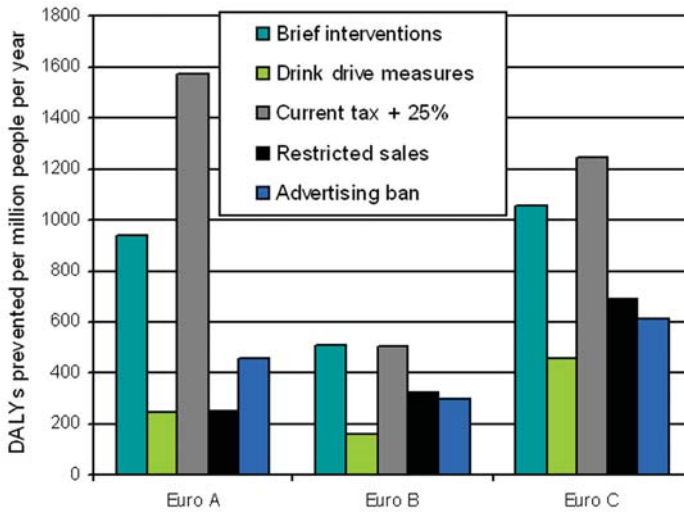


Figure 7.1 The impact of different policy options (DALYs prevented per million people per year) in the three sub-regions of EU25. Source: Chisholm et al. (2004) (adapted).

WHO classification of countries based on mortality rates.		
Europe A	Europe B	Europe C
Very low child and very low adult mortality	Lowchild and low adult mortality	Lowchild and high adult mortality
Austria Belgium Czech Republic Denmark Finland France Germany Greece Ireland Italy Luxembourg Malta Netherlands Portugal Slovenia Spain Sweden United Kingdom	Cyprus Poland Slovakia	Estonia Hungary Latvia Lithuania

In one US study, the average per subject benefit of intervention was estimated as US\$1,151, comprised of savings in emergency department and hospital use (US\$531) and savings in crime and motor vehicle accidents (US\$620) (Fleming et al. 2000). The average cost of the intervention was US\$205 per subject, representing a benefit cost ratio of 5.6:1. The benefit-cost analysis of the 48 month follow-up suggested a \$43,000 reduction in future health care cost for every \$10,000 invested in the early intervention (Fleming et al. 2002). The benefit-cost ratio increased when including the societal benefits of fewer motorvehicle events and crimes. Another US study compared the cost-effectiveness of a strategy of alcohol screening and intervention to a strategy of no screening

7. Costs and cost effectiveness of brief interventions

(Kraemer et al. 2004). They found that screening and intervention yielded savings of \$300 and prevented 0.05 years of ill-health and premature death per man or woman screened.

In an analysis of cost effectiveness in Sweden, Lindholm (1998) estimated that if 10% of those given advice reduced their alcohol consumption over the long term, all the costs of the treatment would be covered by savings in health care expenditure.

7.3 What is the cost effectiveness of brief interventions?

In the World Health Organization's estimates of the costs and impact of different policy measures in preventing ill health and premature death as measured by Disability Adjusted Life Years (DALYs) resulting from hazardous and harmful alcohol consumption, primary health care brief interventions were found to be highly cost effective (€1,960 per DALY prevented in Euro A countries) (Chisholm et al. 2004). This compares favourably with smoking cessation interventions using nicotine replacement therapy with a cost effectiveness of around €2,000 (Feenstra et al. 2003), and is amongst the cheapest of all medical interventions which have an average cost of about €30,000. In other words, if a primary health care provider is going to undertake a new activity, giving brief advice to patients with hazardous and harmful alcohol consumption will give one of the best health benefits for the practice population than spending ten minutes doing anything else.

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8. Implementing identification and brief intervention programmes

Summary of chapter evidence

8.1. What are the conditions for effective involvement of primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption in primary care?

Support is a pre-requisite for primary health care providers' involvement in alcohol problems, in the event of encountering difficulties and to generally ensure continuing professional development. General practitioners who work in a supportive work environment feel more positive about working with alcohol problems and manage a greater number of patients.

8.2. What are the strategies for sustained involvement of primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption in primary care?

Providing training and giving practice based support works, with even limited support of one practice visit and ongoing telephone advice increasing identification and counselling rates of primary health care providers by nearly one half, whereas the simple provision of guidelines is likely to have little effect. Providing training and giving office based support materials appear equally effective, but providing both is more effective than either alone. It does not necessarily seem that more intensive support is better than less intensive support.

8.3. What is the evidence for tailored made support to involve primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption?

Unless the support is geared to the needs and attitudes of the general practitioners, it will not work and over the long term it may even have a detrimental effect. To increase the experience and effectiveness of general practitioners in working with alcohol-problems, both education and training and providing a supportive working environment to improve confidence and commitment are required.

8.4. Should financiers of health services provide funding for primary health care based identification and brief intervention programmes for hazardous and harmful alcohol consumption?

In view of the effectiveness and cost effectiveness in leading to health gain, financiers of health services should provide funding for primary health care based identification and brief intervention programmes to reduce hazardous and harmful alcohol consumption.

8.5. What tools are available to assess the adequacy of services?

The PHEPA project has developed a tool to assess the adequacy of services for hazardous and harmful alcohol consumption in primary care settings.

8. Implementing identification and brief intervention programmes

Recommendations

1. Training for primary health care providers should be implemented, in particular during vocational and specialist training.
2. The introduction of practice based systems, including identification tools, protocols and aids and computerized support increases identification rates and increases advice giving rates.
3. Training and support programmes should be tailored to the needs and attitudes of the practitioners.
4. The provision of specialist help might increase the activity of primary and secondary health care providers, since, if difficulties arise, support from and referral to specialist help can be obtained.
5. There are strong financial and health arguments as to why financiers of health services should provide funding for primary care based identification and brief intervention programmes for hazardous and harmful alcohol consumption.
6. The adequacy of services for hazardous and harmful alcohol consumption in primary care settings should be routinely and regularly monitored using the assessment tool developed by the PHEPA project.

8.1 What are the conditions for effective involvement of primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption in primary care?

General practitioners report that they find managing alcohol problems difficult (Anderson et al. 2003). They are less active in obtaining information about alcohol from their patients, rate reducing alcohol consumption as less important for health, and rate themselves as less prepared and less effective in advising their patients to reduce alcohol intake than in other areas of clinical prevention, such as tobacco dependence, weight control and promoting physical activity (Saunders & Wutzke 1998).

Among the reasons most often cited for lack of general practitioner involvement are lack of time, inadequate training, fear of antagonizing patients, the perceived incompatibility of alcohol brief intervention with primary health care, and the belief that those who are dependent on alcohol do not respond to interventions (Roche & Richard 1991; Roche et al. 1991; Roche et al. 1996; Richmond & Mendelsohn 1996; McAvoy et al. 1999; Kaner et al. 1999a; Cornuz et al. 2000; Aalto et al. 2001; Kaariainen et al. 2001).

Data from the World Health Organization's study on implementing brief interventions for hazardous and harmful alcohol consumption found that less

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than half the practitioners in nine countries had managed seven or more patients for alcohol problems in the previous year (Anderson et al. 2003), Table 8.1. Only two fifths had received four or more hours training and education on alcohol, and only just over one quarter felt that they were working in a supportive environment for delivering brief interventions for hazardous and harmful alcohol consumption. Whereas four fifths of practitioners felt secure in their role in delivering brief interventions for hazardous and harmful alcohol consumption, only just over one quarter felt committed to do so.

Table 8.1 General practitioners and alcohol problems - activities and experiences in selected countries.

Country	Managed 7+ patients for alcohol problems in previous year	Received 4+ hours on education and training on alcohol	Working in what was regarded as a supportive working environment	Felt secure in advising patients about hazardous and harmful alcohol consumption	Felt committed to advising patients about hazardous and harmful alcohol consumption
Australia	44.3%	47.7%	33.0%	83.0%	28.4%
Belgium	41.9%	22.6%	36.6%	82.8%	21.5%
Canada	55.0%	53.3%	25.4%	88.8%	29.0%
England	32.6%	46.9%	47.6%	80.8%	19.2%
France	57.8%	27.7%	18.7%	81.9%	33.1%
Italy	44.0%	38.0%	20.6%	82.7%	32.7%
New Zealand	39.0%	44.1%	14.3%	86.0%	29.4%
Norway	55.4%	49.4%	29.4%	88.1%	25.6%
Portugal	54.9%	62.7%	25.9%	74.5%	27.5%
Total	46.6%	43.1%	27.1%	83.9%	27.1%

Source: Anderson et al. (2003).

Practitioners who had received more education on alcohol and who were working in what was regarded as a supportive working environment felt more secure and committed to advising patients and managed more for alcohol problems in the previous year (Anderson et al. 2003). A supportive working environment was one in which identification and counselling materials, training and support with difficult cases were all available.

8.2 What are the strategies for sustained involvement of primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption in primary care?

A systematic review of interventions to engage primary health care providers in the management of alcohol problems, using the methodology of the Cochrane Effective Practice and Organization of Care Group (EPOC) (Freemantle et al. 1995; Bero et al. 2002) found in fifteen programmes that educational and office

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based interventions increased the involvement of general practitioners in delivering identification and brief interventions by between 13% and 15%, when compared with usual practice or a minimal intervention (Anderson et al. 2004a), Table 8.2.

Table 8.2 Impact of office based and educational support in changing identification and counselling rates of general practitioners for interventions for hazardous and harmful alcohol consumption

	Control	Intervention
Identification rates	35%	46%
Counselling rates	27%	42%

Source: Anderson et al. (2004a)

Providing training and giving office based support materials appear equally effective, but providing both is more effective than either alone. It does not necessarily seem that more intensive support is better than less intensive support. Promising programmes were those that had a specific focus on alcohol, and those that combined both educational and office based interventions, Table 8.3.

Table 8.3 Description of 15 programmes¹

Study	Intervention	Outcome measure	Sample size ²	Effect size ³ (95% CI)
Unit of analysis measuring provider performance at level of provider				
Kaner et al. (1999b) ⁴ England Alcohol specific	One single-faceted educational outreach visit	Screened at least one patient within 12 week implementation period	C=43 I=43	0.47 (-0.38-1.32)
	One multifaceted educational outreach visit and six educational telephone contacts	Screened at least one patient within 12 week implementation period	C=43 I=42	1.15 (0.25-1.05)
Lock et al. (2000a) ⁴ England Alcohol specific	Single faceted telemarketing of intervention programme	Screened at least one patient within 12 week implementation period	C=320 I=213	0.82 (0.17-1.46)
	Single faceted outreach personal marketing of intervention programme	Screened at least one patient within 12 week implementation period	C=320 I=196	1.25 (0.63-1.86)
Lockyer (1996)Canada Alcohol specific	Single faceted one day training workshop with 3 3 hour booster sessions	Performance on standardized patient interviews; average of process and content measures	C=28 I=26	0.42 (-0.33-1.17)

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Study	Intervention	Outcome measure	Sample size ²	Effect size ³ (95% CI)
Gual et al. Unpublished ^{4,5} Alcohol specific	One multifaceted educational outreach visit and six educational telephone contacts	Screened at least 20% of eligible patients within 12 week implementation period	C=22 I=38	1.37 (0.12-2.61)
		Counselled at least 10% of at risk patients within 12 week implementation period	C=22 I=38	1.27 (0.07-2.47)
Pas et al. Unpublished ^{4,5} Alcohol specific	One multifaceted educational outreach visit and six educational telephone contacts	Screened at least 20% of eligible patients within 12 week implementation period	C=60 I=69	0.46 (-0.39-1.31)
		Counselled at least 10% of at risk patients within 12 week implementation period	C=60 I=69	0.43 (-0.35-1.21)
McCormick et al. Unpublished ^{4,5} Alcohol specific	Single faceted six educational telephone contacts	Screened at least 20% of eligible patients within 12 week implementation period	C=39 I=37	0.13 (-0.79-1.35)
		Counselled at least 10% of at risk patients within 12 week implementation period	C=39 I=37	0.36 (-0.57-1.28)
Adams et al. (1998) United States Alcohol specific	Multifaceted educational meetings and office support patient mediated interventions	Received average of 15 counselling steps by physician measured at patient exit interview	C=145 I=201	2.56 (1.99-3.13)
Gomel et al. (1998 ⁴) Australia Alcohol specific	One single faceted educational outreach visit	Number of eligible patients screened	C=18427 I=26248	0.79 (0.74-0.84)
		Number of at risk patients advised by GP during 12 week implementation period	C=3807 I=6066	0.42 (0.29-0.55)
	One multifaceted educational outreach visit and 3 educational telephone contacts	Number of eligible patients screened	C=18427 I=24926	1.10 (1.05-1.15)
		Number of at risk patients advised by GP during 12 week implementation period	C=3807 I=6231	1.02 (0.89-1.15)
Kaner et al. (1999b ⁴) England Alcohol specific	One single-educational outreach visit	Number of at risk patients advised by GP during 12 week implementation period	C=750 I=1127	0.27 (0.09-0.46)
	One multifaceted educational outreach visit and six educational telephone contacts	Number of at risk patients advised by GP during 12 week implementation period	C=750 I=1654	0.33 (0.16-0.51)

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Study	Intervention	Outcome measure	Sample size ²	Effect size ³ (95% CI)
Rodney et al. (1985) United States General	Single faceted organizational change in design of medical records pre-printed with blank space to record alcohol consumption	Records completed by physician during year following change	C=189 I=201	0.88 (0.19-1.57)
Wilson et al. (1992) United Kingdom General	Single faceted organizational provider oriented intervention; increase in length of consultation	Proportion of patients' notes with recording of alcohol consumption	C=2910 I=1411	1.08 (0.63-1.53)
Wilson et al. (1992) United Kingdom General	Single faceted organizational provider oriented intervention; increase in length of consultation	Proportion of patients advised about alcohol consumption	C=1884 I=956	0.42 (0.09-0.75)
Bonevski et al. (1999) Australia General	Single-faceted patient mediated intervention; audit and feedback; reminders	Classified by physician in medical records as hazardous or harmful user of alcohol	C=750 I=675	0.51 (0.22-0.80)
Borgiel et al. (1999) Canada General	Single faceted education workshop with opinion leaders	Asked by physician about alcohol during year following intervention	C=1254 I=1141	0.26 (0.10-0.43)

¹All the studies were randomized controlled trials, with the exception of Wilson *et al.* (1992), which was a controlled clinical trial

²C, number in control group; I, number in intervention group

³All the estimators of effect size were logged odds ratios; proportions were estimated from the data of Lockyer (1996); numbers given are ES with 95% confidence intervals

⁴Part of the World Health Organization Phase III study of the dissemination and implementation of identification and brief intervention programmes in primary health care (Anderson 1996; Monteiro & Gomel 1998)

⁵Data abstracted from analysis undertaken in Funk *et al.* (2005)

Source: Anderson *et al.* (2004a)

The findings were similar to those of other studies that have attempted to change health care providers' behaviour. In a review of outreach visits, which consisted of several components, including written materials and conferences, and in which the targeted behaviours were mostly prescribing practices, there were positive effects in favour of the intervention group in 12 of 13 trials of combined interventions of between 15% and 68% (Thomson O'Brien *et al.* 2002), particularly for those outreach visits that combined a social marketing approach. In the three trials in which outreach visits alone were compared to a no intervention control group, the relative improvement ranged from 24% to 50%. In their review of interventions to improve the delivery of clinical preventive services in primary care Hulscher *et al.* (2002) found that five comparisons of group education versus no intervention showed absolute changes of preventive services varying between -4% and +31%, and fourteen comparisons of multifaceted interventions versus no intervention showed absolute changes of preventive services varying between -3% and +64%.

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Three of the studies provided costs and cost effectiveness data, Table 8.4. At the provider level, the cost of implementation increased with the increasing level of support. At the patient level, the cost per patient advised slightly increased with increasing level of support in the Australian study (Gomel et al. 1998), but decreased in the English study (Kaner et al. 1999b). Wutzke et al. (2001) calculated the cost effectiveness of the Australian data and estimated that there was little difference in the costs per year of life saved between the control and the minimal and maximal support groups.

Table 8.4 Cost and cost-effectiveness data

Outcome at provider level		
		Cost per GP giving at least one intervention
Kaner et al. (1999b)	Materials and instructions only	UK£74.29
	One educational outreach visit	UK£92.80
	One educational outreach visit and six telephone support contacts	UK£128.92
Lock et al. (2000a)	Postal marketing	UK£28.33
	Telemarketing	UK£27.85
	Personal marketing	£127.90

Outcome at patient level			
		Cost per patient advised	Cost per life year saved ¹
Gomel et al. (1998)	Materials and instructions only	Aus\$3.51	Aus\$645
	One educational outreach visit	Aus\$2.16	Aus\$581
	One educational outreach visit and six telephone support contacts	Aus\$4.33	Aus\$653
Kaner et al. (1999b)	Materials and instructions only	UK£8.19	
	One educational outreach visit	UK£6.02	
	One educational outreach visit and six telephone support contacts	UK£5.43	

¹Data from Wutzke et al. (2001).

Source: Anderson et al. (2004a)

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8.3 What is the evidence for tailored made support to involve primary health care providers in identification and brief intervention for hazardous and harmful alcohol consumption?

The World Health Organization's study testing the impact of education and support on increasing practitioners' identification and brief intervention rates for hazardous and harmful alcohol consumption (Funk et al. 2005) found that physicians' attitudes of feeling secure and committed to working with hazardous and harmful alcohol consumption influenced the impact of support and training (Anderson et al. 2004b).

Feeling secure and committed were measured by responses to the short form of the Alcohol and Alcohol Problems Perception Questionnaire (Anderson & Clement 1987). Security measures adequacy, for example "I feel I can appropriately advise my patients about drinking and its effects"; and legitimacy, for example, "I feel I have the right to ask patients questions about their drinking when necessary". Commitment measures motivation, for example "pessimism is the most realistic attitude to take toward drinkers"; task specific self-esteem, for example "all in all I am inclined to feel I am a failure with drinkers"; and work satisfaction, for example "in general, it is rewarding to work with drinkers".

Physician's initial attitudes affected the relationships that training and support and identification and brief intervention had on subsequent changes in attitudes. Training and support only increased identification and brief intervention rates for those who were already secure and committed, Table 8.5.

Table 8.5 Odds ratios (95% CI) for the impact of training and support on identification and brief intervention rates in the presence of high and low baseline role security and high and low baseline therapeutic commitment.

		High identification rates	High brief intervention rates
Security to begin with	Low	0.8 (0.3-1.3)	1.3 (0.5-2.1)
	High	4.3 (2.1-6.5)	4.7 (2.3-7.1)
Commitment to begin with	Low	1.3 (0.5-2.1)	2.1 (0.9-3.3)
	High	3.5 (0.5-2.1)	3.4 (1.7-5.1)

Source: Anderson et al. (2004b)

Both security and commitment deteriorated over the course of the study. Providing support did not improve subsequent security and commitment and for those who were already insecure and uncommitted, actually made their security and commitment worse, Table 8.6. The experience of identification and brief intervention did not increase security and commitment. For those who were already insecure, the experience of brief interventions actually made their security worse.

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Table 8.6 Odds ratios (95% CI) for the impact of training and support, high identification rates and high brief intervention rates on increased security and commitment at 6 months follow-up in the presence of high and low security and high and low commitment to begin with.

	Increased security		Increased commitment	
	Security to begin with	Odd ratio (95% CI)	Commitment to begin with	Odd ratio (95% CI)
Training and support	Low	0.2 (0.03-0.4)	Low	0.5 (0.1-0.9)
	High	2.0 (0.8-3.2)	High	1.2 (0.4-2.0)
High identification rates	Low	2.2 (0.5-3.9)	Low	0.8 (0.2-1.4)
	High	1.1 (0.4-1.8)	High	1.9 (0.7-3.1)
High brief intervention rates	Low	0.5 (0.1-0.9)	Low	0.8 (0.2-1.4)
	High	1.8 (0.7-2.9)	High	1.0 (0.4-1.6)

Source: Anderson et al. (2004b)

Thus, in the absence of security and commitment, the impact of professionally and organizationally based programmes is considerably diminished. Although the importance of acquiring experience of dealing with drinking problems in a supportive environment has been emphasized as a crucial element in securing professional commitment for the detection and management of alcohol problems, unless the emotional responses of the general practitioners are taken into account, the impact of such support will not achieve its full potential.

8.4 Should financiers of health services provide funding for primary health care based identification and brief intervention programmes for hazardous and harmful alcohol consumption?

Hazardous and harmful alcohol consumption is a leading cause of disability and premature death in Europe, leading to considerable costs to the health care sector and harm to both adults and children. Although highly cost effective interventions are available to reduce hazardous and harmful alcohol consumption, they are poorly used by drinkers, and rarely embedded in routine clinical practice by health care providers.

It has been estimated that for every 1,000 patients cared for by a general practitioner, it would cost €1644 a year on average throughout the European Union to set up and maintain an identification and brief intervention programme. Brief physician advice with 25% coverage would save 91 years of ill-health and premature death per 100,000 population, 9% of all ill-health and premature death caused by alcohol. At a cost of €1960 per year of ill-health and premature

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death prevented, primary health care brief interventions for hazardous and harmful alcohol consumption are amongst the cheapest of all medical interventions that lead to health gain.

To address the deficiencies in the use of effective interventions to reduce hazardous and harmful alcohol consumption, to increase the involvement of the health care sector in the provision of such interventions, and to reduce the economic burden caused by alcohol to the health care sector, financiers of primary health care services should ensure that support is given to the full and comprehensive implementation of these guidelines, and, where it is not in place, full reimbursement for the delivery of brief intervention programmes is introduced.

8.5 What tools are available to assess the adequacy of services?

The aetiology and the course of alcohol use disorders are to a large extent explained by behavioural, environmental and life course factors (McLellan et al. 2000; Bacon 1973; Öjesjö 1981; Edwards 1989; Moos et al. 1990). Alcohol use disorders can be described as environmentally responsive (Curran et al. 1987; Pattison et al. 1977; Humphreys et al. 2002) clinical disorders; they are readily responsive to environmental policy factors, such as the price of alcohol and regulations on the availability of alcohol (Bruun et al. 1975; Edwards et al. 1994; Babor et al. submitted for publication); they are also readily responsive to interventions (Klingemann et al. 1992; Blomqvist 1998), whose impact is likely to be enhanced in the presence of effective environmental policies. It has been argued that intervention systems should be part of the public health response to alcohol use disorders and should be accessible, available and affordable (Heather 1995; Humphreys & Tucker 2002); in particular, interventions aimed at drinkers with hazardous and harmful alcohol consumption should be disseminated more broadly (Institute of Medicine 1990).

A tool has been developed by the PHEPA project to assess the adequacy of brief intervention programmes for hazardous and harmful alcohol consumption (PHEPA 2005). The tool comprises five dimensions which can support the implementation of brief intervention programmes, defined and structured by the Ottawa Charter for Health Promotion (World Health Organization 1986), public health, supportive environments, personal skills, community action and health care systems. In particular, the tool assesses the health care systems dimension, which includes the five domains of organization of health care, support for providing interventions, availability of effective interventions, provision of effective interventions by health care providers, and uptake of effective interventions by health care users.

The tool provides a baseline measurement of services for managing hazardous and harmful alcohol consumption, identifying areas where services may require development or strengthening; provides a mechanism for monitoring service provision over time; allows sharing of information and examples of practice

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between countries and regions; and provides a mechanism for coalitions or partnerships to discuss and have a shared view on services for managing hazardous and harmful alcohol consumption.

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9. Assessing the harm done by alcohol and alcohol dependence

Chapter summary

Assessing the harm done by alcohol and alcohol dependence

Patients with hazardous and harmful alcohol consumption and those with a clinical suspicion of harmful alcohol consumption or alcohol dependence can benefit from further assessment. A first line tool is the World Health Organization's ten item Alcohol Use Disorders Identification Test. AUDIT scores of 20 or more are indicative of alcohol dependence (although this can occur with lower scores) and patients may require referral to a specialist for diagnostic evaluation and treatment. Alcohol dependence can be measured with the alcohol dependence module of the World Health Organization's Composite International Diagnostic Interview (CIDI). This contains seven questions to measure alcohol dependence, with a positive answer to four or more being diagnostic. Elevated levels of serum GGT and the aminotransferases, CDT and MCV are often due to alcohol. Since these tests are performed routinely as part of a biochemical test battery, the presence of an elevated level should alert the clinician to a possible diagnosis of harmful alcohol consumption and alcohol dependence.

Managing withdrawal symptoms

People who are physically dependent upon alcohol are likely to experience withdrawal symptoms 6 to 24 hours after the last drink is consumed. Diazepam is recommended as the first-line treatment for withdrawal because of its relatively long half-life and evidence for effectiveness. The standard therapeutic regimen involves regular doses of diazepam over two to six days, not continuing past day six, to avoid the risk of dependence.

Managing alcohol dependence

Some people with alcohol dependence get better by themselves, and not everyone with alcohol dependence requires specialist treatment, although many do. People with alcohol dependence can be managed in primary health care if they agree to abstain even if they think that they are not dependent on alcohol; they refuse to be referred to a specialized centre; and they have no severe psychiatric, social or medical complications. People with alcohol dependence should be referred for specialist treatment when there have been previous unsuccessful treatment attempts; when there are severe complications or risk of moderate to severe withdrawal symptoms; when there is serious medical illness or psychiatric co-morbidity; and when treatment cannot be managed by the primary care team.

Specialist treatments include behavioural approaches and pharmacotherapy. Social skills training, the community reinforcement approach, and behavioural marital therapy are among the most effective approaches, particularly when they emphasize the person's ability to stop or reduce drinking through learning self management skills, motivational enhancement, and strengthening the person's support system. Acamprosate and the opiate antagonist naltrexone

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are also effective. Methods that lack effectiveness include those designed to educate, confront, shock or foster insight regarding the nature and causes of alcohol dependence, as well as mandatory attendance to Alcoholics Anonymous. There is little evidence to suggest that the overall outcomes of treatment can be improved when patients are matched to different types of treatment.

The best model for the relationship between primary care and specialist services is not clear, although it seems that integrated primary care and specialist treatment gives a better outcome than when the two services are separated. Follow-up may reduce the risk of relapse, so it is important for primary health care providers to maintain contact over the long term with patients treated for alcohol dependence who are no longer in contact with specialist services.

As described in Chapter 1, the aim of these guidelines is to summarize the evidence of the harm done by alcohol and how to undertake identification and brief interventions for hazardous and harmful alcohol use in primary care. The guidelines are not a manual for the treatment of alcohol dependence. However, this chapter briefly describes alcohol dependence and how it can be assessed and managed, so primary health care providers know what to expect when more difficult to manage patients are referred for specialist help.

9.1 The Purpose of assessment

The purpose of assessment Assessment has two important functions. First, it assists the patient and clinician to develop shared treatment goals and a treatment plan. Different patients will require different approaches, as people with alcohol dependence do not have a homogeneous group of problems. Underlying and accompanying problems must be identified, even if the causal relationship is not clear. Second, the assessment interview is used for rapport to develop. If the clinician shows the patient empathy and courtesy and provides a sense of hope and optimism, the patient is less likely to take a defensive stance, and is more likely to accept the possibility of change. In this shared process, feedback from the clinician can encourage the patient to appraise their situation from a new perspective. Assessment is the beginning of therapy, and sympathetic understanding of the implications of this for the drinker and the family is important. The clinician's approach should be positive but realistic.

The principles of assessment Assessment is one of the earliest opportunities the clinician has for engaging and retaining the patient in treatment. Intensive treatment for alcohol problems should begin with a comprehensive assessment so that the most appropriate intervention(s) can be selected. Assessment should be balanced with achieving treatment progress so that the patient remains motivated. Assessment should lead to agreed treatment goals and a treatment plan. The treatment plan should be based on the most effective intervention for the patient, not just on the kind of treatment typically provided. It is preferable

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that the patient be informed about the range of options for intervention available locally and assisted to make a reasoned decision as to which intervention is most suited to his or her needs. Assessment should continue throughout treatment as the patient's progress is measured against the treatment goals. Assessment should combine a variety of techniques for gathering information about the patient, including diagnostic interviews, standardized questionnaires, medical examinations, and/or biochemical tests.

Much information can be best collected in a semi-structured, open-ended interview, using a guided exploration of the patient's subjective experience of drinking. This has the advantage of clinician involvement which is personal and responsive to the drinker, rather than mechanical and impersonal. Yet, it should maintain a purposeful structure so as to avoid a vague, directionless discussion of the drinker's history. The assessment should emphasize the patient's present situation. Information about past experiences is useful in clarifying how the patient came to be in the present situation and what is maintaining maladaptive thoughts and behaviours. However, the assessment should be geared to collecting information that will help to tailor treatment so that it is appropriate for the patient.

Engaging the patient in treatment Patient engagement may be viewed in terms of intensity and duration of treatment participation. Higher levels of engagement are predictive of positive treatment outcomes and are, in turn, contingent upon both patient characteristics - for example pre-treatment motivation, higher pre-treatment alcohol consumption, higher levels of concentration - and treatment experiences: strength of the therapeutic relationship, perceived helpfulness of the treatment services, empathy of the clinician, removal of practical barriers such as transportation, and the inclusion of relapse prevention training (Fiorentine et al 1999; Joe et al 1999). Clinician characteristics and the therapeutic relationship are also crucial to engaging the patient in treatment (Ritter et al 2002). The patient's perception of a gap between their goals and their present state may improve motivation for change (Miller 1995). Acknowledging the patient's goals rather than insisting on a particular set of goals is more effective motivationally (Miller 1987) and may produce better outcomes (Sanchez Craig 1990). There is also evidence that providing the patient with a choice of treatment options improves treatment retention (Rokke et al 1999).

9.2 Assessment methods

The Alcohol Use Disorders Test as an assessment tool

A first line tool is the World Health Organization's ten item Alcohol Use Disorders Identification Test (Babor et al 2001) (see Chapter 5). The AUDIT was not only designed to detect less severe alcohol problems, such as hazardous and harmful drinking, but also dependence disorders. High scores on three items, in the absence of elevated scores on the remaining items, suggest hazardous alcohol

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use. High scores on four other items suggest harmful alcohol use and high scores on the remaining three items imply the presence or emergence of alcohol dependence. Scores of 8 or more on the AUDIT predict a future risk of engaging in hazardous drinking, physical and social harm and health care utilization. AUDIT scores in the range 16-19 are considered hazardous and harmful alcohol consumption, which can be managed by a combination of simple advice, brief counselling and continued monitoring, with further diagnostic evaluation indicated if the patient fails to respond or is suspected of possible alcohol dependence. AUDIT scores of 20 or more are indicative of alcohol dependence (although this can occur with lower scores) and patients may require referral to a specialist for diagnostic evaluation and treatment.

The operating characteristics of the AUDIT as a screening tool for alcohol dependence vary with the cut-off used to determine positive results of a screen and whether one is interested in detecting a lifetime (i.e., if patients met criteria for these disorders at any point in their life) or current diagnosis. For instance, in one study, the AUDIT had a sensitivity of 61% and a specificity of 90% for a current alcohol use disorder with the use of a cut-off of 8 (Barry et al. 1993) (for definitions of sensitivity and specificity, see Chapter 5). Changing the cut-off score to greater than 11 resulted in an expected decrease in sensitivity of (40%) and an increase in specificity (96%). The performance characteristics changed dramatically when the investigators considered lifetime alcohol use disorders. In this situation, the AUDIT had a sensitivity of 46% and 30% with a specificity of 90% and 97% with the use of cut-off scores of 8 and 11, respectively (Barry et al. 1993). Other investigators found that the AUDIT had a sensitivity of 63% and 93% and a specificity of 96% and 96%, for a lifetime or current diagnosis, respectively, of dependence (Isaacson et al. 1994). The AUDIT did not perform as well as a screening test in a study by Schmidt et al (1995). In this study, the AUDIT had a sensitivity of 38% with a specificity of 95% for a lifetime diagnosis of dependence. These results are similar to those obtained by Morton et al (1996) with a cut-off of 8 in a population older than 65 years. In this study, the AUDIT had a sensitivity of 33% and a specificity of 91%. The AUDIT was noted to have different performance characteristic within different ethnic and sex populations (Steinbauer et al. 1998). With a cut-off of 8 for a positive test, the AUDIT had a sensitivity between 70% and 92% with a specificity of 73% to 94%, with variation based on sex and ethnic background.

The Composite International Diagnostic Interview (CIDI).

The Composite International Diagnostic Interview (CIDI) includes an interview schedule to diagnose alcohol dependence, Box 9.1 (World Health Organization 2002a).

The alcohol dependence score (range 0-7) is equivalent to the number of positive responses to the seven symptom questions (World Health Organization 2002b). Questions 1.1 and 6.1 are *not* used in the scoring. A score of three is considered a probable case of alcohol dependence and a score of four or more a case of alcohol dependence.

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Clinical examination

A clinical examination can sometimes be helpful in the detection of chronic harmful alcohol use. Clinical screening procedures have been developed for this purpose (Babor et al. 1985). These include tremor of the hands, the appearance of blood vessels in the face, and changes observed in the mucous membranes (e.g., conjunctivitis) and oral cavity (e.g., glossitis).

Conjunctival injection. The condition of the conjunctival tissue is evaluated on the basis of the extent of capillary engorgement and scleral jaundice. Examination is best conducted in clear daylight by asking the patient to direct his gaze upward and then downward while pulling back the upper and lower eye-lids. Under normal conditions, the normal pearly whiteness is widely distributed. In contrast, capillary engorgement is reflected in the appearance of burgundy-coloured vascular elements and the appearance of a greenish-yellow tinge to the sclera.

Abnormal skin vascularization. This is best evaluated by examination of the face and neck. These areas often give evidence of fine wiry arterioles that appear as a reddish blush. Other signs of chronic alcohol ingestion include the appearance of 'goose-flesh' on the neck and yellowish blotches on the skin.

Hand tremor. This should be estimated with the arms extended anteriorly, half bent at the elbows, with the hands rotated toward the midline.

Tongue tremor. This should be evaluated with the tongue protruding a short distance beyond the lips, but not too excessively.

Hepatomegaly. Hepatic changes should be evaluated both in terms of volume and consistency. Increased volume can be gauged in terms of finger breadths below the costal margin. Consistency can be rated as normal, firm, hard, or very hard.

Box 9.1 Composite International Diagnostic Interview (CIDI) for measuring alcohol dependence.

1 In the past 12 months, was there ever a time when your drinking or being hung over interfered with your work at school, or a job, or at home?

- 1 Yes
- 2 No

1.1 If yes, How often in the past year?

- 1 Once or Twice
- 2 Between 3 and 5 times
- 3 Between 6 and 10 times
- 4 Between 11 and 20 times
- 5 More than 20 times

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2 During the past 12 months, were you ever under the influence of alcohol in a situation where you could get hurt – like when driving a car or boat, using knives or guns or machinery, or anything else?

- 1 Yes
- 2 No

3 During the past 12 months, did you have any emotional or psychological problems from using alcohol – such as feeling uninterested in things, feeling depressed, suspicious of people, paranoid, or having strange ideas?

- 1 Yes
- 2 No

4 During the past 12 months, did you have such a strong desire or urge to drink that you could not keep from drinking?

- 1 Yes
- 2 No

5 During the past 12 months, did you have a period of a month or more when you spent a great deal of time drinking or getting over the effects of alcohol?

- 1 Yes
- 2 No

6 During the past 12 months, did you ever have more to drink than you intended to, or did you drink much longer than you intended to?

- 1 Yes
- 2 No

6.1 If yes, How often in the past year?

- 1 Once or Twice
- 2 Between 3 and 5 times
- 3 Between 6 and 10 times
- 4 Between 11 and 20 times
- 5 More than 20 times

7 During the past 12 months, was there ever a time when you had to drink much more than you used to to get the same effect you wanted?

- 1 Yes
- 2 No

Laboratory tests

γ - glutamyl transferase (GGT). While GGT can be elevated in the absence of liver damage (Wu et al. 1976; Majumdar et al. 1991), it also tends to be the first test elevated in alcohol- induced liver damage (Rosalki 1984). Together with the aminotransferases, albumin and bilirubin levels and clotting studies, the extent of test elevation can be used as a broad indicator of presence and severity of hepatic impairment, although GGT levels can fall in more advanced cirrhosis. Between 5% and 20% of dependent drinkers with a histologically normal liver show elevation of GGT, compared with more than 90% of dependent drinkers with cirrhosis (Wu et al. 1976; Majumdar et al. 1991; Moussavian et al. 1985; Matsuda et al. 1993). GGT elevation may also be a marker for other physical complications of alcohol use: excessive drinkers who have elevated GGT levels are more likely to also have hypertension than those drinking at the same level with normal GGT results (Hashimoto et al. 2001). GGT has been shown to be an independent predictor of future blood pressure and a rise in GGT is thought to be a marker of increased susceptibility to the pressor effects of alcohol (Yamada et al. 1989; 1991).

In addition to detecting current pathology, GGT levels have been reported to be predictive of future morbidity and mortality. GGT was shown to be predictive of all cause mortality in three large cohorts of men (Peterson et al. 2003; Hood et al. 1990; Wannamethee et al 1995; Brenner et al. 1997). In the Malmö study, Sweden, GGT results in the top decile for the community were also predictive of hospitalizations over the ensuing 4–7 years (Kristenson 1987). GGT is a predictor of the subsequent development of hypertension (Miura et al 1994; Conigrave et al 1995; Lee et al. 2002), independent of baseline alcohol consumption, of diabetes (Perry et al. 1998) and of thrombotic stroke (Jousilahti et al. 2000). Pregnant women who have elevated GGT levels are more likely to deliver a baby with foetal alcohol syndrome (Halmesmaki et al. 1986), although sensitivity in predicting this condition is only 50% (for a specificity of 80%) in pregnant women drinking more than 100 g of alcohol per week (Sarkola et al 2000).

GGT is used regularly (Persson & Magnusson 1989; Anton et al. 2002) to monitor response to treatment. Typically a reduction in GGT levels will be apparent from the first week of reducing or stopping drinking, and will be marked by the end of the first month (Monteiro & Masur 1986). The early reduction can help confirm a diagnosis of excessive drinking. GGT levels typically fall halfway towards normal over 5–17 days of abstinence (Lamy et al 1974). The fall towards normal takes longer in dependent drinkers, with a reported half-life of 26 days (Orrego et al 1985). GGT levels are likely to increase 20–30% above the baseline in dependent drinkers who relapse (Anton et al 1996; Anton et al 2002; Irwin et al 1988). GGT was used both as the prime method of screening and also as a tool in intervention in the Malmö study, Sweden (Kristenson 1987; Kristenson et al 1983). Middle-aged men with GGT levels in the top decile were randomized to treatment or control groups. In the treatment group men were given counselling,

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and were informed of the link between their raised GGT levels and drinking. Every 3 months GGT results were fed back to the patient together with motivational counselling. The intervention group was found to have a significant reduction in sick leave and days of hospitalization and a non-significant reduction in mortality compared to controls (Kristenson 1987; Kristenson et al 1983). Similarly, GGT was used successfully as a component of screening and intervention in the Tromsø study in Norway (Nilssen 1991). Clinically, feedback of blood test results is useful both in motivating patients to change their drinking and in encouraging patients who have made progress, although no studies have established the extent of benefit over counselling alone.

The aminotransferases AST and ALT AST (previously known as SGOT, serum glutamicoxaloacetic transaminase) and ALT (also known as SGPT, serum glutamic pyruvic transaminase) are sensitive indicators of liver cell injury (Pratt & Kaplan 2000). Like GGT, aminotransferases are not increased by a single episode of excessive drinking (Devgun et al 1985; Nemesanszky et al 1988; Freer & Statland 1977). The aminotransferases are less sensitive than GGT in detecting heavy alcohol consumption. Like GGT, the aminotransferases act not only as markers of alcohol consumption but also as indicators of hepatic damage from alcohol.

Erythrocyte Mean Cell Volume (MCV) MCV is a test that is performed so commonly that there is opportunity to use it in opportunistic case finding. Approximately 3–5% of out-patients will have elevated MCVs and alcohol is the most common cause for this (Seppa et al 1996). Because of its slow response to changes in drinking, MCV is generally unsuitable as a marker of short-term progress (Po et al 1990; Monteiro & Masur 1986).

Alcohol Alcohol can be determined routinely in blood, urine or breath (Helander 2001; Eggers *et al.* 2002). The detection time is limited to hours, and single determination cannot differentiate between short or long term heavy use, although high values may be helpful in determining alcohol tolerance (Jones 1994; Helander 2001).

Alcohol dissolves in the total body water compartment and its volume of distribution is considered to equal the body water (Watson 1989). Total body water content depends upon age, weight and gender, and is greater for males than females (about 50–60% of total body weight in males versus 45–55% of body weight in females) (Kyle *et al.* 2001). Thus, when a woman and a man with the same approximate weight and age consume the same amount of alcohol the alcohol concentration will be higher in the woman, because the alcohol is dissolved in a smaller volume of body water. Ultimately, about 85% of the alcohol that enters the body is metabolized in the liver by enzymatic oxidation. About 7 g of alcohol can be metabolized per hour, equivalent to about one drink per hour.

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The concentration of alcohol in whole blood or breath has become the standard system for measuring and reporting alcohol concentrations in the body. Most laws referring to alcohol specify that the proportion of alcohol in the whole blood be used to measure the level of intoxication. Blood alcohol levels (BAL) or Blood alcohol concentration (BAC) are calculated using the weight of alcohol in milligrams and the volume of blood in deciliters. This yields a BAC that can be expressed as a proportion (i.e. 100 mg per deciliter or 1.0 g per litre) or as a percentage (i.e. 0.10% alcohol).

5-HTOL The serotonin metabolite 5-hydroxytryptophol (5-HTOL) is a normal, minor constituent of urine and is excreted mainly in conjugated form with glucuronic acid. The formation of 5-HTOL increases dramatically after alcohol intake, due to a metabolic interaction, and the elevated urinary excretion remains for some time (> 5–15 hours depending on dose) after alcohol has been eliminated. This biochemical effect can be used for detection of recent alcohol intake (Helander & Eriksson 2002). 5-HTOL is not routinely available for clinical purposes.

Ethyl glucuronide (EtG) EtG is a non-volatile, water soluble, stable, direct metabolite of ethanol that can be detected in various body fluids, tissues and hair. Shortly after the consumption even of small amounts of ethanol, EtG becomes positive. It can detect ethanol intake up to 80 hours after the complete elimination of alcohol from the body (WHO/ISBRA Study on State and Trait Markers of Alcohol Use and Dependence 1997). EtG is not routinely available for clinical purposes.

Acetaldehyde Protein Adducts and Antibodies Ethanol is metabolized to acetaldehyde by alcohol dehydrogenase, followed by conversion to acetate by aldehyde dehydrogenase. Acetaldehyde concentrations in the blood during ethanol metabolism are normally very low (in the micromolar range or below). Acetaldehyde can react with free amino groups in proteins to produce acetaldehyde-protein adducts, by a mechanism analogous to the formation of glycoproteins by glucose (Braun et al., 1997). The sensitivity such adducts have as markers of alcohol intake has been assessed in a small number of studies using differing analytical approaches (Sillanaukee et al 1992; Lin et al., 1993; Hazelett et al., 1998), with results varying between 20% and 80%. Such adducts are not routinely available for clinical purposes.

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9.3 Managing acute withdrawal

People who are physically dependent upon alcohol are likely to experience withdrawal symptoms 6 to 24 hours after the last drink is consumed. The alcohol withdrawal syndrome usually begins as the blood alcohol level (BAL) reduces and may become clinically apparent usually before the BAL reaches zero (Yost 1996; Foy et al 1997). The alcohol withdrawal is usually self-limiting and usually uncomplicated resolving within 5 days with minimal or no intervention. However, this depends largely on the individual's drinking pattern, frequency, duration and quantity. While for most individuals the alcohol withdrawal syndrome is short-lived and inconsequential in others it increases in severity through the first 48 to 72 hours of abstinence. The patient becomes highly vulnerable to psychological and physiological stress during this time.

Alcohol withdrawal symptoms may be present when the person has a significant BAL. The BAL does not have to be zero for the onset of alcohol withdrawal to occur, with a significant proportion of dependent drinkers experiencing the onset of withdrawal symptoms before the BAL reaches zero. Patient care should not be decided based on the BAL alone. Alcohol withdrawal rating scales should also be used to assess the patient's level of alcohol withdrawal symptoms. The severity of alcohol withdrawal also depends on the number of drinks per day, the total number and severity of past withdrawal episodes, greater use of non-therapeutic sedative and hypnotic drugs, and the number of medical problems.

Withdrawal-induced seizures may occur 12 to 48 hours after the last drink is consumed. A patient with a previous history of alcohol withdrawal seizures should be given withdrawal medication, preferably as a loading dose regime with diazepam orally and in some cases intravenously. Some patients may experience hallucinations, which may occur during any stage of the alcohol withdrawal phase. A small percentage of patients withdrawing from alcohol experience delirium during the first 24 to 48 hours of withdrawal. Delirium tremens is by far the most serious life-threatening complication of the alcohol withdrawal syndrome, which usually occurs 48 to 96 hours after the last drink is consumed, and should be monitored. Patients at risk of Wernicke-Korsakoff's syndrome should be treated with parenteral 100mg thiamine before any glucose intake.

A range of alcohol withdrawal management settings currently exist. Home-based withdrawal management is appropriate when there are no signs of severe withdrawal, no history of severe withdrawal, there are supportive relatives or friends who can help to assist and look after the person and there are no known coexisting medical or psychiatric illnesses. In outpatient withdrawal management patients attend a clinic or facility, usually on a daily basis for assessment and to collect withdrawal medication. It is appropriate for patients with no obvious severe withdrawal, or history of severe withdrawal and no known

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coexisting medical or psychiatric illnesses. Inpatient withdrawal management is required for people who have a severe history of alcohol withdrawal symptoms, a known coexisting medical or psychiatric illness and/or an unfavourable home environment.

Diazepam is recommended as “gold standard” and as first-line treatment for withdrawal because of its relatively long half-life and evidence for effectiveness. Diazepam can be given as a loading dose, where 20mg is given every two hours until the withdrawal subsides or the patient is sedated after which a further dose is usually unnecessary. However, the standard therapeutic (fixed-schedule therapy) regimen involves regular doses of diazepam over two to six days. A regular starting dose is 10mg every six hours for two days. An additional 10mg can be supplemented if required up to a recommended two doses. The dose is usually tapered over the latter days and should not continue past day six, to avoid the risk of dependence.

The administration of alcohol, barbiturates, beta-adrenergic blockers, clonidine, acamprosate and gamma- hydroxybutyrate acid (GHB) as agents to facilitate alcohol withdrawal are not recommended. Chlormethiazole is not recommended as a first line treatment and may only be useful in patients experiencing severe withdrawal symptoms. Anticonvulsant medications should not be used in routine practice, as they are not effective in preventing alcohol withdrawal complications such as seizures. However, anticonvulsants should be made available for patients currently taking them for other medical reasons. The use of major tranquillisers or antipsychotic medications should be reserved for patients with hallucinosis and paranoid symptoms that occur during alcohol withdrawal and have not responded to a conventional sedative regime. If psychotic symptoms persist, a psychiatric evaluation may be required. All pharmacotherapy treatment should be used with an alcohol withdrawal rating scale and stored in a safe environment away from patient access. All patients who are experiencing the alcohol withdrawal syndrome should receive thiamine and an oral multi-vitamin preparation each day for a week.

9.4 Non-pharmacological treatments for alcohol dependence

Characteristics of effective clinicians The effect of clinician characteristics on treatment for alcohol use disorders has received far less attention than therapy and patient variables. The difficulty of studying clinician effects has contributed to this lack of investigation (Caroll 2001). However, there is some evidence on clinician effects which suggests that the effect of therapy is mediated by clinician characteristics. Having strong interpersonal skills has been most strongly and consistently associated with higher treatment effectiveness (Finney & Moss 2002; Najavits & Weiss 1994). Najavits et al. (2000) found a marked effect of differing clinician style on the outcome of behavioural interventions. Patients of clinicians who were more interpersonally skilled, less confrontational

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or more empathic were found to have better outcomes (Najavits & Weiss 1994). Differences in clinicians' effectiveness were not attributable to training, treatment orientation or experience (Miller et al 1993). When a supportive style is compared with a confrontational style, confrontation is associated with increased patient resistance and higher levels of drinking (Miller et al 1993). In fact, the more clinicians confronted patients, the more patients drank. According to a meta-analysis which included, but was not limited to, substance use disorder outcome studies, clinician effects on treatment outcomes decrease when adhering to treatment increases (Crits-Cristoph 1991). Clinicians who can form a warm, supportive relationship with the patient, and who can show empathy, are likely to achieve greater improvement in patient functioning. Clinicians should develop an organised approach to patient management, keeping careful case and progress notes, which helps in anticipating difficulties and makes planning and practising methods to deal with difficult situations before they arise easier.

Counselling General counselling and associated skills are effective for counselling people who have problems with alcohol. Counselling skills such as listening and empathy should form the basis of any therapeutic relationship. However, counselling is not usually sufficient to change drinking behaviours and should be supported by more specific techniques. The two principal goals of counselling are first, to help patients manage their problems in order to live more effectively, and to develop unused resources and missed opportunities more fully, and, second, to help patients become better at helping themselves in their everyday lives.

Motivational interviewing Motivational interviewing is a procedure which was introduced by Miller and Rollnick (1991). They define motivational interviewing as "a patient-centred, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" (Miller & Rollnick 2002). The goal of motivational interviewing is to steer the patient towards motivation for change by eliciting reasons for change from the patient. Motivational interviewing is patient-centred, emphasising that behaviour change is voluntary, and that responsibility for decisions and results of behaviour change rests with the patient. It is directive, aimed toward a resolution of ambivalence. Motivational interviewing is a method of communication rather than a set of techniques, or a specific strategy. There is reasonable evidence supporting the effectiveness of motivational interviewing as an effective stand-alone treatment for dependent drinkers. Miller and Rollnick (2002) suggest three general processes through which motivational interviewing may achieve its effects, namely, collaboration, evocation and autonomy. A collaborative relationship between the clinician and the patient is a key element of motivational interviewing. The clinician should communicate a partner-like relationship, providing support rather than persuasion or coercion. Evocation refers to the role of the clinician to elicit resources and motivation for change from within the patient. Autonomy relates to the patient's independence and responsibility for change, which must be affirmed and supported by the clinician.

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There are four broad, guiding principles that underlie motivational interviewing: express empathy, develop discrepancy, roll with resistance and support self-efficacy. An empathetic counselling style is a fundamental and defining characteristic of motivational interviewing. Empathy is seen as the foundation on which motivational interviewing is built. The expression of empathy refers to an attitude of acceptance and respect for the drinker, and involves reflecting the individual drinker's concerns about harmful alcohol consumption. A second general principle of motivational interviewing is to create a discrepancy between the patient's present behaviour and his or her broader goals and values. The notion of developing discrepancy is aimed at clarifying important life goals with the drinker, and exploring the consequences of continued drinking that conflict with those goals. The technique of rolling with resistance is related to avoiding argumentation, as argumentation is counterproductive. Rather, resistance of a patient can be reframed to create momentum towards change. The last principle of motivational interviewing involves the concept of self efficacy which refers to a person's belief in his or her ability to carry out and succeed with a specific task.

Cognitive-behavioural interventions The term "cognitive behavioural" refers to an approach covering a range of strategies and techniques based on learning principles, around the idea that modifying and re-learning behaviour is influenced by how people view themselves and others. Most treatment approaches that have been demonstrated to be effective in treating alcohol use disorders fall within the broad rubric of cognitive behavioural approaches (Miller & Wilbourne 2002). On the basis of evidence supporting the effectiveness of cognitive behavioural interventions, well articulated procedures and protocols for implementation, and acceptance and popularity, cognitive behavioural interventions are likely to provide an effective, practical basis for the treatment of harmful drinking and alcohol dependence. They are delivered in a form that allows for a rapport and trust to be developed between clinician and patient in a non-confronting and empathic atmosphere. These approaches are compatible with other interventions such as pharmacological interventions and motivational interviewing techniques.

Skills training Skills training is a form of cognitive behavioural treatment intervention. It involves teaching people social skills that might help them function without the use of alcohol. There is consistent evidence that skills training helps to reduce alcohol consumption in both the short term and the long term among risky drinkers and alcohol dependent persons. Skills training can be used to compensate for skills deficits that have led to the use of drinking as a coping strategy. It has also been linked to Marlatt and Gordon's model of relapse prevention and may help patients to deal with high risk situations (Marlatt & Gordon 1985). Skills training is recommended for use with patients who have a high risk of relapse. They are of most benefit to those patients who lack the relevant skills, and should be offered to those patients whom clinicians perceive as lacking relevant skills. Although it is often difficult to ascertain which skills patients possess, particularly without appropriate assessment, asking patients what problems they experience and how they cope with them can expose the

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areas in which patients are lacking social skills. Skills training can be used with patients aiming at moderation or abstinence. Several approaches may be appropriate for one person and skills training approaches are often offered in combination. The intervention chosen should be relevant to the patient's needs. Training in social skills and other coping skills will require some commitment on the part of the patient as these methods are enhanced when the patient actively participates in therapy and continues to practise outside therapy. A key element of skills training is breaking down behaviour into component steps. This is essential if learning new ways of behaving is to occur, because most behaviours are engrained and occur without the person's knowledge of what he or she is doing. Included are: problem solving skills training; drink refusal skills training; assertive skills training; communication skills training; relaxation training; and stress management skills training.

Behavioural self-management Behavioural self-management is a cognitive behavioural treatment intervention. Behavioural self-management training involves a series of strategies such as: self-monitoring; setting drinking limits; controlling rates of drinking; identifying problem drinking situations; and self-reward for limited drinking.

Self-guided materials Self-guided materials have been available to help individuals to change problematic drinking behaviours since the 1970s (Fingeld 2000). Self-guided materials can be used either with other treatment interventions or as a stand-alone intervention. There are several self-help manuals available for use by drinkers who wish to cease or cut down drinking without the aid of professionals (Ryder et al 1995; Sanchez Craig 1993) and there is evidence that the use of these manuals is associated with a marked diminution of drinking (Spivak et al 1994; Sitharthan et al 1996). Self-help manuals have been recognised as an important addition to treatment interventions as they may target a portion of the population that does not usually receive treatment. The use of self-help materials is most appropriate for harmful drinkers rather than those suffering from dependence. Self-help books can be used when there is professional intervention as they enhance the messages that are provided through more formal face-to-face intervention.

Psychosocial relapse prevention strategies are effective in reducing alcohol intake, reducing the severity of relapse, and improving psychosocial outcomes. Relapse prevention works equally well across treatment settings, in combination with different types of treatment, and in group or individual sessions. The optimum duration and intensity of relapse prevention is unclear, and may vary from patient to patient with different problems and needs. Because relapse is one of the most important problems for those attempting to overcome addictive behaviours, addressing the problem is an essential aspect of treatment and one that poses major difficulties in the area of drug and alcohol dependence. There is a substantial relapse rate within the first year after treatment of about 60

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percent, when relapse is defined as a return to problem drinking (Connors et al. 1996). Relapse prevention aims to maintain long term abstinence or moderate drinking behaviours, and to decrease the severity of relapse if it does occur. The conceptual model of relapse prevention views relapse as a natural part of the process of change: lapses and relapses are viewed as opportunities for patients to understand their behaviour and develop new skills to deal with high-risk situations (Parks et al 2001). Traditionally, relapse prevention refers to the model of relapse prevention developed by Marlatt and colleagues (Marlatt & Gordon 1985). This model includes a variety of cognitive and behavioural approaches designed to target each step of the relapse process. These approaches include specific intervention strategies that focus on the immediate determinants of relapse as well as global self management strategies that focus on the covert antecedents of relapse (Larimer & Marlatt 1999). Both the specific and global strategies fall into three main categories: skills training, cognitive restructuring and lifestyle balancing. Such strategies are designed to address the immediate precursors of relapse and involve the training of coping skills, challenging positive outcome expectancies associated with alcohol use and how to cope with lapses. Effective relapse prevention also requires that longer term factors in relapse are addressed.

9.5 Effectiveness of Non-pharmacological treatments for alcohol dependence

Table 9.1, from the Mesa Grande study, an ongoing updated systematic review of the effectiveness of different treatments for hazardous and harmful alcohol consumption, ranks the effectiveness of 48 different treatment modalities (Miller & Wilbourne 2002). Mesa Grande summarizes the evidence after weighting the findings of studies by their methodological quality score; the higher the score, the better is the quality of the study. Study ratings also resulted in the assignment of an outcome logic score for each treatment modality for which specific efficacy could be inferred from the design. A positive outcome logic score is assigned when a study design permitted strong inference of a specific effect (e.g. comparison of the treatment with an untreated control), and a beneficial effect was reflected as a statistically significant difference. A negative outcome logic score is assigned when a study has a design logic that should clearly show a treatment effect if one were present (e.g. comparison with a no-treatment or placebo control). The Cumulative Evidence Score (CES) is the methodological quality score multiplied by the outcome logic score, summed across all studies, with positive trials adding points and negative trials deducting points from the total. Treatment modalities are listed in Table 9.1 ranked by the CES.

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Table 9.1 Effectiveness of treatments for hazardous and harmful alcohol consumption

Treatment modality	CES	N	Treatment modality	CES	N
1. Brief Intervention	390	34	27. Group Process Psychotherapy	-34	3
2. Motivational Enhancement	189	18	28. Functional Analysis	-36	3
3. GABA Agonist (Acamprosate)	116	5	29. Relapse Prevention	-38	22
4. Community Reinforcement	110	7	30. Self-Monitoring	-39	6
5. Self-Change Manual (Bibliotherapy)	110	17	31. Hypnosis	-41	4
6. Opiate Antagonist (e.g. naltrexone)	100	6	32. Psychedelic Medication	-44	8
7. Behavioural Self-Control Training	85	31	33. Antidipsotropic - Calcium Carbimide	-52	3
8. Behaviour Contracting	64	5	34. Attention Placebo	-59	3
9. Social Skills Training	57	20	35. Serotonin Agonist	-68	3
10. Marital Therapy – Behavioural	44	9	36. Treatment as Usual	-78	15
11. Aversion Therapy, Nausea	36	6	37. Twelve Step Facilitation	-82	6
12. Case Management	33	5	38. Alcoholics Anonymous	-94	7
13. Cognitive Therapy	21	10	39. Anxiolytic Medication	-98	15
14. Aversion Therapy, Sensitization	18	8	40. Milieu Therapy	-102	14
15. Aversion Therapy, Apnoeic	18	3	41. Antidipsotropic – Metronidazole	-103	11
16. Family Therapy	15	4	42. Antidepressant Medication	-104	6
17. Acupuncture	14	3	43. Videotape Self Confrontation	-108	8
18. Client-Centred Counselling	5	8	44. Relaxation Training	-152	18
19. Aversion Therapy, Electrical	-1	18	45. Confrontational Counselling	-183	12
20. Exercise	-3	3	46. Psychotherapy	-207	19
21. Stress Management	-4	3	47. General Alcoholism Counselling	-284	23
22. Antidipsotropic - Disulfiram	-6	27	48. Education (tapes, lectures or films)	-443	39
23. Antidepressant - SSRI	-16	15			
24. Problem Solving	-26	4			
25. Lithium	-32	7			
26. Marital Therapy – Non-behavioural	-33	8			

CES = Cumulative Evidence Score.

N = Total number of studies evaluating this modality.

Source: Miller & Wilbourne 2002

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As demonstrated in chapter 6, brief interventions head the list of evidence-based treatment methods, even with brief motivational enhancement approaches removed to a separate category. The high CES values for these two categories reflect a relatively large number of studies with a high percentage of positive findings. Beyond the large volume of studies conducted, CES is further enhanced by the fact that brief interventions are often compared with a true no-treatment control. Because brief interventions are often tested with people who were not seeking treatment for alcohol problems (e.g. identified in health-care settings as at-risk drinkers), this CES declines when only studies with treatment seeking populations are considered.

Behavioural skill training approaches dominate the remainder of the top 10 list of treatment methods supported by controlled trials. Three of these pay particular attention to the client's social support network: social skills training, the community reinforcement approach, and behavioural marital therapy. Two common specific components of behaviour therapy—behaviour contracting and self-monitoring—also appear on the top 10 list.

The list of better-supported treatment methods points to some general themes that may characterize more effective behavioural approaches. There is an emphasis on the person's ability to stop or reduce drinking. Sometimes this is done through teaching self-management skills, and sometimes by encouraging the person to utilize his or her own natural resources. There is also an emphasis on the client's motivation for change, whether through intrinsic motivational enhancement, specific behaviour contracting, or the rearrangement of social contingencies to favour change. Attention to the person's social context and support system is prominent among several of the most supported approaches.

Ineffective treatments include those designed to educate, confront, shock or foster insight regarding the nature and causes of alcohol dependence, relaxation training, milieu therapy and mandatory Alcoholics Anonymous attendance, along with poorly specified counselling and standard treatment-as-usual.

9.6 Pharmacological treatments for alcohol dependence

As table 9.1 indicates, both acamprosate (GABA agonist) and naltrexone (opiate antagonist) and have been shown to improve treatment outcomes. For patients who are motivated to take the medication, both are potential tools in preventing relapse to heavy or dependent drinking. For some, medication permits a critical period of sobriety, during which the patient can learn to live without alcohol and then maintain abstinence without the help of medication. Acamprosate is thought to reduce drinking by modulating the brain glutamate function which is implicated in withdrawal symptoms and relapse triggered by cues related to previous withdrawal experiences. Naltrexone is an anti-craving drug that reduces the chance of a lapse becoming a relapse. It acts upon the brain's opiate receptors and may work by reducing some aspects of the euphoric effects of alcohol.

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Acamprosate is moderately effective as an adjunctive therapy in reducing relapse risk in the short term. Acamprosate appears to be moderately effective as an adjunctive therapy in the longer term (up to two years). Acamprosate can be started during alcohol withdrawal, when no interactions are observed with withdrawal medications. Acamprosate therapy should be started within one week of completing withdrawal. Patients who receive treatments that include strategies to increase compliance have better outcomes.

Naltrexone as an adjunctive therapy is moderately effective in reducing relapse risk and alcohol consumption in the short term. Naltrexone may be more effective for preventing relapse to heavy or problem drinking than for maintaining abstinence from alcohol. Targeted naltrexone in response to cravings may be of some use in reducing relapse risk. In combination with naltrexone, coping skills therapy appears to be more effective than abstinence-oriented supportive therapy in reducing relapse risk and alcohol consumption. Coping skills therapy may help patients to cope with lapses. However, supportive therapy with naltrexone may produce higher rates of abstinence.

At present, there is no substantial evidence base from which to choose between acamprosate and naltrexone.

9.7 Which treatment for which patient

In a 1990 report, the Institute of Medicine of the US National Academy of Sciences strongly advocated research on patient-treatment matching or tailoring (Institute of Medicine 1990). Although there have not been studies on the effect of patient matching for non-treatment seeking populations with hazardous or harmful alcohol consumption in primary health care settings, project MATCH, was designed to test the general assumption that matching would improve treatment outcomes in specialist settings for alcohol dependent patients, and in particular to test specific matching effects hypothesized on the basis of prior matching findings (Project MATCH Research Group 1993). The trial employed three individually delivered treatments that differed widely in philosophy and practice: (1) a 12-session Twelve-Step Facilitation Therapy (TSF) designed to help patients become engaged in the fellowship of Alcoholics Anonymous; (2) a 12-session Cognitive Behavioural Therapy (CBT) designed to teach patients coping skills to prevent relapse to drinking; and (3) a Motivational Enhancement Therapy (MET) designed to increase motivation for and commitment to change, consisting of four sessions scheduled over 12 weeks.

A total of 1726 individuals, varying widely in personal characteristics and alcohol problem severity, were assigned randomly to the three treatments at sites located in nine communities across the United States. The three treatments were tested in parallel studies in two types of settings: outpatient and aftercare.

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There were 952 outpatients (72% males), and 774 aftercare patients (80% males) recruited immediately following inpatient or intensive day hospital treatment. Specific a priori hypotheses were derived from previous research to predict which individuals would respond best to the three treatments. The following patient characteristics were investigated: severity of alcohol involvement, cognitive impairment, conceptual level, gender, meaning-seeking, readiness for change, psychiatric severity, social support for drinking, sociopathy, typology classification (Type A, Type B), alcohol dependence, anger, antisocial personality, assertion of autonomy, psychiatric diagnosis, prior engagement in Alcoholics Anonymous, religiosity, self-efficacy and social functioning. Outcome evaluations were conducted at 3 month intervals during the first 15 months of follow-up at all sites. In addition, 39-month follow-ups were completed at the five outpatient sites.

Patients in all three treatment conditions showed major improvement not only on drinking measures, but in many other areas of life functioning as well (Project MATCH Research Group 1997a). The frequency of drinking decreased four-fold from about 25 drinking days per month before treatment to fewer than 6 days per month after treatment. The volume of drinking decreased five-fold from about 15 drinks per day before treatment to about three drinks per drinking day after treatment. Patients showed significant decreases in depression, alcohol-related problems and in the use of other drugs, as well as improvement in liver function. Improvements that occurred during treatment were well maintained throughout the 12 months following the end of treatment. A 39-month follow-up of the outpatient sample indicated continued maintenance of these high abstinence rates (Project MATCH Research Group 1998).

The central purpose of Project MATCH was to determine whether patient treatment matching or tailoring would improve outcome. Of the first 10 matching variables, however, only one a priori prediction was supported (outpatients with few or no psychological problems had more abstinent days during most of the year following treatment when given twelve-step facilitation treatment than when given cognitive behavioural therapy) and there were relatively few outcome differences among the three different treatments designed to differ dramatically in philosophy and procedures (Project MATCH Research Group 1997a). The results suggested that triaging clients to individual therapy, at least based on the attributes and treatments studied in Project MATCH, is not a requirement for treatment success as previously believed.

One of the reasons put forward as to why Project MATCH, probably one of the largest and statistically most powerful psychotherapy trials ever conducted, failed to confirm the hypothesis that overall outcome of treatment could be improved when patients were matched to different types of treatment is that the most powerful intervention was the research itself (Stockwell 1999). It is reasonable to suggest that with a chronically relapsing condition like alcohol dependence a few therapeutic sessions over 12 weeks will have less long-term

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impact on drinking than a series of follow-up interviews strategically placed over a 3-year period. Many of the ingredients of what is considered to be an effective motivational intervention are contained in such a series of research interviews, for example, a non-judgemental focus on recent drinking behaviour and related harms and the expectation of this being repeated over an extended time period. Indeed, there was slightly more contact time (5 hours) spent on follow-up assessments over the 3 years of the study than there was in one of the treatments, Motivational Enhancement Therapy (Project MATCH Research Group 1997b). If assessment has a therapeutic benefit then it greatly reduces the possibility of finding matching effects simply because all treatment groups received identical amounts of follow-up assessment.

Although evidence does not indicate that certain patients respond best to certain treatment interventions, in practice clinicians do match patients to treatments. Clinicians often use criteria such as severity of dependence, the presence of co-occurring pathology or other problems such as marital problems or a lack of social support to assign patients to treatment. By doing this, clinicians ensure that the treatments offered consider the factors associated with the alcohol problem (Mattson 1994). Further, the clinician can make the decision with the patient about treatment modality. It is thought that if the patient contributes in deciding which treatment to receive, they are more likely to participate more fully in treatment. In this situation the clinician describes the available treatment options that might best assist with the various deficits or problems identified as being associated with the patient's drinking, and the patient and clinician agree upon which treatment is likely to be most appropriate.

9.8 What is the role of primary care in managing alcohol dependence?

Some people with alcohol dependence get better by themselves, and not everyone with alcohol dependence requires specialist treatment, although many do (Dawson et al 2005) (see Chapter 3). People with alcohol dependence can be managed in primary health care if they agree to abstain even if they think that they are not dependent on alcohol; they refuse to be referred to a specialized centre; and they have no severe psychiatric, social or medical complications. People with alcohol dependence should be referred for specialist treatment when there have been previous unsuccessful treatment attempts; when there are severe complications or risk of moderate to severe withdrawal symptoms; when there is serious medical illness or psychiatric co morbidity; and when treatment cannot be managed by the primary care team.

The best model for the relationship between primary care and specialist services is not clear. In the United States, at least, it seems that integrated primary care and addiction treatment gives a better outcome than when the two services are separate (Weisner et al 2001; Samet et al 2001). Follow-up may reduce the risk of relapse (Hilton et al 2001; Stout et al 1999), so it is probably important for GPs to maintain contact over the long term with patients treated for alcohol dependence who are not still in treatment with specialist services.

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Why offer identification and brief intervention programmes?

There are many forms of alcohol use that can cause substantial risk or harm to the individual. They include high level drinking each day, repeated episodes of heavy episodic drinking ('binge drinking'), drinking that is actually causing physical or mental harm, and drinking that has resulted in the person becoming dependent or addicted to alcohol. *Hazardous drinking* is a pattern of alcohol consumption that increases the risk of harmful consequences for the user or others. *Harmful use* refers to alcohol consumption that results in consequences to physical and mental health. *Alcohol dependence* is a cluster of behavioural, cognitive, and physiological phenomena that may develop after repeated alcohol use. The risks related to alcohol are linked to the pattern of drinking and the amount of consumption (see Chapter 4). While persons with alcohol dependence are most likely to incur high levels of harm, the bulk of harm associated with alcohol occurs among people who are *not* dependent, if only because there are so many of them. Therefore, the identification of drinkers with various types and degrees of at-risk alcohol consumption has great potential to reduce all types of alcohol-related harm.

Of utmost importance for screening and brief intervention programmes is the fact that people who are not dependent on alcohol find it easier to reduce or stop their alcohol consumption, with appropriate assistance and effort, than those who are dependent. Once dependence has developed, cessation of alcohol consumption is more difficult and may require specialized treatment. Identification for alcohol consumption among patients in primary care provides an opportunity to educate patients about the risks of excessive alcohol use. Information about the amount and frequency of alcohol consumption may inform the diagnosis of the patient's presenting condition, and it may alert clinicians to the need to advise patients whose alcohol consumption might adversely affect their use of medications and other aspects of their treatment.

Identifying hazardous and harmful alcohol consumption

Hazardous and harmful alcohol consumption can be identified in three ways:

Quantity/frequency (Q/F) questions that require patients to summarize the amount of alcohol they consume and the frequency with which they drink, either for specific time frames (e.g. a week or past month or past year) or in terms of their 'typical' or 'usual' drinking patterns, Figure A1.

Questions	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 or 9	10 or more

Figure A1 An example of a quantity frequency questionnaire

If a patient states that they drink 2-3 times a week, and 5 or 6 drinks on a typical drinking day, then their average consumption is 2.5 times 5.5, equals nearly 14 drinks a week.

AUDIT-C, the first three questions of the Alcohol Use Disorders Identification test (AUDIT), Figure A2. The AUDIT-C is easy to score. The number in the column of each response checked by the patient should be entered by the scorer in the extreme right-hand column. All the response scores should then be added and recorded in the box labelled "Total".

Questions	0	1	2	3	4
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times week
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 or 9	10 or more
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily

Figure A2 AUDIT-C

The full ten item AUDIT, which was designed to identify hazardous and harmful alcohol consumption in primary care settings, Figure A3. The AUDIT is also easy to score. The number in the column of each response checked by the patient should be entered by the scorer in the extreme right-hand column. All the response scores should then be added and recorded in the box labelled "Total".

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Questions	0	1	2	3	4	
1. How often do you have a drink containing alcohol?	Never	Monthly or less	2-4 times a month	2-3 times a week	4 or more times a week	
2. How many drinks containing alcohol do you have on a typical day when you are drinking?	1 or 2	3 or 4	5 or 6	7 or 9	10 or more	
3. How often do you have six or more drinks on one occasion?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
4. How often during the last year have you found that you were not able to stop drinking once you had started?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
5. How often during the last year have you failed to do what was normally expected from you because of drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
7. How often during the last year have you had a feeling of guilt or remorse after drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?	Never	Less than monthly	Monthly	Weekly	Daily or almost daily	
9. Have you or someone else been injured as a result of your drinking?	No		Yes, but not in the last year		Yes, during the last year	
10. Has a relative or friend or a doctor or another health worker been concerned about your drinking or suggested you cut down?	No		Yes, but not in the last year		Yes, during the last year	
					Total	

Figure A3. AUDIT

How should questions or identification instruments be administered?

Questionnaires may be administered either as an oral interview or as a self-report questionnaire. A self-report question takes less time, is easy to administer, is suitable for computer administration and scoring, and may produce more accurate answers. Completion by interview allows clarification of ambiguous answers, can be administered to patients with poor reading skills, and allows seamless feedback to the patient, and the initiation of brief advice.

Even though patients may be identified for hazardous and harmful alcohol consumption at anytime, there are at least four situations in which identification can be undertaken:

- As part of new patient registration
- As part of a routine intervention
- Before prescribing a medication that interacts with alcohol
- In response to problems that might be alcohol related

Risk levels and intervention criteria

The different responses to the differing risk levels is summarized in Table A1.

Table A1. Responses based on risk levels to be adapted depending on country specific evaluations and guidelines.

Risk level			Intervention	Role of PHC
Low	Alcohol consumption (grams/week)	<280 g/w men <140 g/w women	Primary prevention	Health education, advocacy, role model
	AUDIT-C	<5 men <4 women		
	AUDIT	<8		
Hazardous*	Alcohol consumption (grams/week)	280-349 g/w men 140-209 g/w women	Simple advice	Identification, assessment, brief advice
	AUDIT-C	≥5 men ≥4 women		
	AUDIT	8-15		
Harmful	Alcohol consumption (grams/week)	≥ 350 g/w men ≥ 210 g/w women	Simple advice plus brief counselling and continued monitoring	Identification, assessment, brief advice, follow-up
	AUDIT	16-19 Presence of harm		
High (alcohol dependence)	AUDIT	≥ 20 ICD-10 criteria	Specialized treatment	Identification, assessment, referral, follow-up

*Any consumption in pregnant women, and people younger than 16 years or with illness or treatments that advise against alcohol consumption.

Source: Anderson (1996).

Who is appropriate for alcohol education?

People whose risk level is low may nevertheless benefit from information about alcohol consumption. Most people's alcohol use varies over time. Thus, a person who is drinking at low risk levels now may increase consumption in the future.

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Moreover, alcohol industry advertising and media stories about the benefits of alcohol consumption may lead some non-drinkers to drink for health reasons and others who drink at low levels to consume more. Therefore, a few words or written information about the risks of drinking may prevent hazardous or harmful alcohol use in the future. Patients should also be praised for their current low-risk practices and reminded that, if they do drink, they should stay within these levels. Information about what constitutes a standard drink is essential to understanding those limits (see Chapter 3). It may take less than a minute to communicate this information and to ask if the patient has any questions. *"If you do drink, please do not consume more than two drinks per day, and always make sure that you avoid drinking at least two days of the week, even in small amounts. It is often useful to pay attention to the number of 'standard drinks' you consume, keeping in mind that one bottle of beer, one glass of wine, and one drink of spirits generally contain about the same amounts of alcohol. People who exceed these levels increase their chances of alcohol-related health problems like accidents, injuries, high blood pressure, liver disease, cancer, and heart disease."*

Who is appropriate for brief advice?

People whose risk level is hazardous. Brief advice has the following five elements:

Give feedback that the patient's drinking falls into the risky drinking category. Specific harm identified by the AUDIT and from the patient's presenting symptoms should be itemized, and the seriousness of the situation should be emphasized.

Provide information on the specific risks of continued drinking at hazardous and harmful levels.

Enable a goal to be established by the patient to change drinking behaviour.

Give advice on limits Most patients are likely to choose a low risk drinking goal. They then need to agree to reduce their alcohol use to these "low-risk drinking limits".

Provide encouragement Hazardous drinkers are not dependent on alcohol and can more easily change their drinking behaviour. The health care worker should seek to motivate the patient by restating the need to reduce risk and by encouraging the patient to begin now.

The following techniques contribute to the effectiveness of delivering simple advice:

Be empathic and non-judgmental Health workers should recognize that patients are often unaware of the risks of drinking and should not be blamed for their ignorance. Since hazardous drinking is usually not a permanent condition but a pattern into which many people occasionally fall only for a period of time, a health care provider should feel comfortable in communicating acceptance of

the person without condoning their current drinking behaviour. Remember that patients respond best to sincere concern and supportive advice to change. Condemnation may have the counterproductive effect of both the advice and the giver being rejected.

Be authoritative Health workers have special authority because of their knowledge and training. Patients usually respect them for this expertise. To take advantage of this authority, be clear, objective, and personal when it comes to stating that the patient is drinking above set limits. Patients recognize that true concern for their health requires that you provide authoritative advice to cut back or quit.

Deflect denial Sometimes patients are not ready to change their drinking behaviour. Some patients may deny that they drink too much and resist any suggestion that they should cut down. To help patients who are not yet ready to change, make sure that you are speaking authoritatively without being confrontational. Avoid threatening or pejorative words like “alcoholic,” motivating the patient instead by giving information and expressing concern. If the patient’s screening results have indicated a high level of drinking or an alcohol related problem, use this information to ask them to explain the discrepancy between what medical authorities say and their own view of the situation. You are then in a position to suggest that things may not be as positive as they think.

Facilitate Since the intended outcome of providing simple advice is to facilitate the patient’s behaviour change, it is essential that the patient participates in the process. It is not sufficient just to tell the patient what to do. Rather, the most effective approach is to engage the patient in a joint decision making process. This means asking about reasons for drinking, and stressing the personal benefits of low-risk drinking or not drinking. Of critical importance, the patient should choose a low-risk drinking goal or not drinking and agree at the conclusion of this process that he or she will try to achieve it.

Follow-up Periodic follow-up with each patient is essential to sound medical practice. Since hazardous drinkers are not currently experiencing harm, their follow-up may not require urgent or expensive service. However, follow-up should be scheduled as appropriate for the perceived degree of risk to assure that the patient is achieving success in regard to the drinking goal. If a patient is achieving success, further encouragement should be offered. If not, the health care worker should consider brief counselling or a referral for diagnostic evaluation.

Who is Appropriate for Brief Counselling?

People whose risk level is harmful. The goal of brief counselling is to reduce the risk of harm resulting from excessive drinking. Because the patient may already be experiencing harm, brief counselling includes an obligation to inform the patient that this action is needed to prevent alcohol-related medical problems.

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Brief counselling is a systematic, focused process that relies on rapid assessment, quick engagement of the patient, and immediate implementation of change strategies. It differs from simple advice in that its goal is to provide patients with tools to change basic attitudes and handle a variety of underlying problems. While brief counselling uses the same basic elements of simple advice, its expanded goal requires more content and, thus, more time than simple advice. In addition, health workers who engage in such counselling would benefit from training in empathic listening and motivational interviewing. Like simple advice, the goal of brief counselling is to reduce the risk of harm resulting from excessive drinking. Because the patient may already be experiencing harm, however, there is an obligation to inform the patient that this action is needed to prevent alcohol-related medical problems.

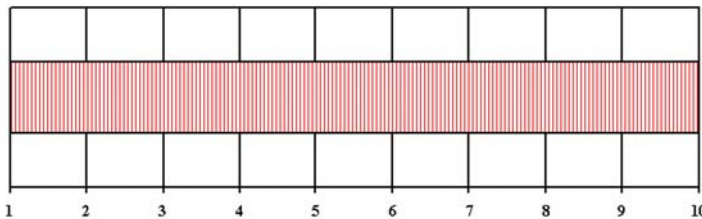
There are three essential elements of brief counselling:

Give Brief Advice A good way to begin brief counselling is to follow the same procedures described above under simple advice to initiate a discussion about alcohol. In this case the patient is informed that screening results indicate present harmful use. The specific harm(s) (both identified by the AUDIT and from the patient’s presenting symptoms) should be itemized, and the seriousness of the situation should be emphasized.

Assess and Tailor Advice to Stage of Change The stages of change represent a process that describes how people think about, initiate, and maintain a new pattern of health behaviour. The five stages summarized in Box A1 are each matched with a specific brief intervention element. One of the simplest ways to assess a patient’s readiness to change their drinking is to use the “Readiness Ruler”, in which the patient is asked to rate on a scale of 1 to 10, “How important is it for you to change your drinking?” (with 1 being not important and 10 being very important).

Not Important

Very important



Pre-contemplators

Contemplators

Actors

Patients who score in the lower end of the scale are pre-contemplators. Those who score in the middle range (4-6) are contemplators, and those scoring in the higher range should be considered ready to take action. If the patient is at the pre-contemplation stage, then the advice session should focus more on feedback in order to motivate the patient to take action. If the patient has been thinking about taking action (contemplation stage), emphasis should be placed on the benefits of doing so, the risks of delaying, and how to take the first steps. If the patient is already prepared for taking action, then the health worker should focus more on setting goals and securing a commitment from the patient to cut down on alcohol consumption.

Box A1 The stages of change and associated brief intervention elements

Stage	Definition	Brief intervention elements to be emphasized
Precontemplation	The hazardous or harmful drinker is not considering change in the near future, and may not be aware of the actual or potential health consequences of continued drinking at this level	Feedback about the results of the screening and Information about the haards of drinking
Contemplation	The drinker may be aware of alcohol-related consequences but is ambivalent about changing	Emphasize the benetits of changing, give Information about alcohol problems, the risks of delaying, and discuss how to choose a goal
Preparation	The drinker has alrady decided to change and plans to take action	Discuss how to choose a Goal , and give Advice and Encouragement
Action	The drinker has begun to cut down or stop drinking, but change has not become a permanent feature	Rewiew Advice give Encouragement
Maintenance	The drinker has achieved moderate drinking or abstinence on a relatively permanent basis.	Give Encouragement

Follow-up Maintenance strategies of providing support, feedback, and assistance in setting, achieving, and maintaining realistic goals should be built into the counselling plan from the beginning. This will involve helping the patient identify relapse triggers and situations that could endanger continued progress. Since patients receiving brief counselling are currently experiencing alcohol-related harm, periodic monitoring as appropriate for the degree of risk during and (for a time) after the counselling sessions is essential. If the patient is making progress, should be given to moving the patient to the next highest level of intervention, referral to extended treatment if it is available. If such specialized treatment is not available, regular monitoring and continued counselling may be necessary.

Who is Appropriate for referral for alcohol dependence?

Patients who score 20 or more on the AUDIT screening test (although this can occur with lower scores) are likely to require further diagnosis and specialized treatment for alcohol dependence. It should be remembered, however, that the AUDIT is not a diagnostic instrument, and it is therefore unwarranted to conclude (or inform the patient) that alcohol dependence has been formally diagnosed. In addition, certain persons who score under 20 on the AUDIT, but who are not appropriate for simple advice or brief counselling, should be referred to specialty care. These may include persons strongly suspected of having an alcohol dependence syndrome; persons with a prior history of alcohol or drug dependence (as suggested by prior treatment) or liver damage; persons with prior or current serious mental illness; persons who have failed to achieve their goals despite extended brief counselling.

Providing referral to diagnosis and treatment The goal of a referral should be to assure that the patient contacts a specialist for further diagnosis and, if required, treatment. While most patients know how much they are drinking, many are resistant to taking immediate action to change. The reasons for such resistance include not being aware their drinking is excessive; not having made the connection between drinking and problems; giving up the benefits of drinking; admitting their condition to themselves and others; and not wanting to expend the time and effort required by treatment. The effectiveness of the referral process is likely to depend upon a combination of the health care provider's authority and the degree to which the patient can resolve such resistance factors. A modified form of simple advice is useful for making a referral, using *feedback, advice, responsibility, information, encouragement, and follow-up*.

Feedback Reporting the results of the AUDIT screening test should make clear that the patient's level of drinking far exceeds low risk limits, specific problems related to drinking are already present, and there are signs of the possible presence of alcohol dependence syndrome. It may be helpful to emphasize that such drinking is dangerous to the patient's own health, and potentially harmful to loved ones and others. A frank discussion of whether the patient has tried unsuccessfully to cut back or quit may assist the patient in understanding that help may be required to change.

Advice The health care worker should deliver the clear message that this is a serious medical condition and the patient should see a specialist for further diagnosis and possibly treatment. The possible connection of drinking to current medical conditions should be drawn, and the risk of future health and social problems should be discussed.

Responsibility It is important to urge the patient to deal with this condition by seeing the specialist and following recommendations. If the patient indicates such willingness, information and encouragement should be provided. If the patient is resistant, another appointment may be needed to allow the patient time to reflect on the decision.

Information Patients who have not previously sought treatment for alcohol problems may need information about what is involved. After describing the health workers they will meet and the treatment they will receive (see Chapter 9), patients are likely to be more receptive to making a decision to enter treatment.

Encouragement Patients in this situation are likely to benefit from words of assurance and encouragement. They should be told that treatment for alcohol dependence is generally effective, but that considerable effort may be needed on their part.

Follow-up Following alcohol treatment, patients should be monitored in the same way a primary care provider might monitor patients being treated by a cardiologist or orthopaedist. This is particularly important because the alcohol dependence syndrome is likely to be chronic and recurring. Periodic monitoring and support may help the patient resist relapse or to control its course if it occurs.

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Members of the Phepa network

PARTNERS

Rolande James Anderson
The Irish College of General Practitioners
(Ireland)

Sverre Barfod
The Alcohol Group, Central Research Unit of
General Practice (Denmark)

Preben Bendtsen
Department of Health and Society, Social
Medicine and Public Health Science, Linköping
University, (Sweden)

Antoni Gual
Alcoholology Unit of the Hospital Clínic,
(Spain)

Nick Heather
School of Psychology & Sport Sciences,
Northumbria University,
(England)

Annemarie Huiberts
Netherlands Institute of Health Promotion
and Disease Prevention (Netherlands)

Philippe Michaud
Programme "Boire Moins c'est Mieux"
France

Leo Pas
Scientific Society of Flemish General
Practitioners (WVVH) (Belgium)

Cristina Ribeiro Gomes
Direcção Geral da Saúde (Portugal)

Emanuele Scafato
Istituto Superiore Di Sanita, Scientific
Governmental Research Organization (Italy)

Kaija Seppä
University of Tampere, Medical School
(Finland)

Michael Smolka
University of Heidelberg; Central Institute of
Mental Health, Department of Addictive
Behaviour and Addiction Medicine (Germany)

OBSERVERS

Alexander Kantchelov
National Centre for Addictions (Bulgaria)

Marko Kolsek
Department of Family Medicine (Slovenia)

Jerzy Mellibruda
State Agency for the Prevention of Alcohol
Related Problems (Poland)

Eleonóra Sineger
Hungarian Association of Addictologists
(Hungary)

Hana Sovinova
National Institute of Public Health
(Czech Republic)

EXPERTS

Mauri Aalto
National Public Health Institute (Finland)

Peter Anderson
Public health consultant (United Kingdom)

Mats Berglund
University Hospital MAS (Sweden)

Joao Breda
Direcção Geral da Saúde (Portugal)

Jonathan Chick
Royal Edinburgh Hospital (United Kingdom)

Joan Colom
Program on Substance Abuse, Health
Department Government of Catalonia
(Spain)

Bart Garmyn
Scientific Society of Flemish General
Practitioners (WVVH) (Belgium)

Isidore S. Obot
Department of Mental Health and
Substance Dependence (WHO)

Lidia Segura
Program on Substance Abuse, Health
Department Government of Catalonia
(Spain)