Diagnosis and management of alcohol use disorders

Andrew J R Parker,¹ E Jane Marshall,² David M Ball³

See also **EDITORIAL** by Babor

¹South London and Maudsley NHS Trust, Maudsley Hospital, London SE5 8AZ

²King's College London, Institute of Psychiatry, Addiction Research Unit, London SE5 8AF

³King's College London, Social Genetic and Developmental Psychiatry Centre, Institute of Psychiatry, London SE5 8AF

Correspondence to: A J R Parker andrew.parker@iop.kcl.ac.uk

BMJ 2008;336:496-501
doi:10.1136/bmj.39483.457708.80

Alcohol use disorders account for 4% of the global burden of disease and cause 1.8 million deaths (3.2% of total) each year.¹ The overall economic cost to society is huge—around £20bn (€26.7bn; \$39bn) each year in the United Kingdom—mostly as a result of lost productivity and alcohol related crime.² Healthcare professionals have a vital role to play in implementing secondary prevention, and in identifying those who need specialist treatment. Well validated screening tools have recently become available, and the effectiveness of early brief interventions and more intensive treatments, together with the cost effectiveness of intensive treatments provide a strong impetus for improving the identification and management of disorders of alcohol misuse.³

Methods

We used the term “alcohol” to search the online electronic databases of the World Health Organization (WHO), the Cochrane Library, the National Treatment Agency for Substance Misuse, the National Institute for Health and Clinical Excellence (NICE), and the UK Department of Health for suitable evidence based material and policy documents.

How are alcohol use disorders defined?

Box 1 lists the categories of alcohol use disorders used by WHO and in an important UK review of treatment for alcohol problems.³ The pattern of drinking and the total weekly consumption of alcohol are important determinants of alcohol related harm, so “binge drinkers” are included in the categories of hazardous drinking and harmful drinking.

How common are alcohol use disorders?

In England, about 38% of men and 16% of women (26% overall) have an alcohol use disorder, and 6% of men and 2% of women have alcohol dependency.⁴ Given that per capita alcohol consumption in the UK has doubled in the past 40 years, and deaths from liver cirrhosis continue to rise sharply, such disorders may be increasing in the UK. This contrasts with western Europe as a whole, particularly southern Europe,

where per capita alcohol consumption and deaths from liver cirrhosis have decreased over the same period.⁵

How are alcohol use disorders identified and diagnosed?

In the UK, 20% of patients attending primary care clinics drink in an “at risk” manner, although most of them go undetected.⁶ Better identification and treatment of alcohol problems is one of four aims of the alcohol harm reduction strategy for England.⁷ In the UK, experts recommend confining routine screening to new patient registrations, general health checks, and special types of consultation.³ The key lesson for healthcare professionals in all settings is that the detection of alcohol use disorders can be improved by making clinical inquiry part of routine practice (box 2) and by using validated screening tools.

What screening tools are helpful?

The 10 item AUDIT (alcohol use disorders identification test) questionnaire, which takes about two minutes to complete, was developed by WHO for use in primary care.⁹ The questionnaire has excellent sensitivity and specificity; has been evaluated in a range of settings, populations, and cultural groups; and is available in all major languages. Shortened forms of the AUDIT questionnaire have been developed for circumstances where time is short.³ These include AUDIT-C (the first three items of AUDIT) and the fast alcohol screening test (FAST), which is based on four AUDIT items. FAST takes about 20 seconds to complete and is useful in primary care and accident and emergency settings.¹⁰ A printable version is available from NICE (www.nice.org.uk). The Paddington alcohol test is also an efficient tool for use in the accident and emergency setting.¹¹ AUDIT and its derivatives are superior to CAGE for the detection of hazardous harmful drinking.

Detecting excessive use of alcohol in pregnancy is important for reducing harm to the unborn fetus. Two brief questionnaires, T-ACE and TWEAK, which take only one minute to complete are the tools of choice.³

Box 1 Classification of alcohol use disorders**Hazardous drinking**

A level or pattern of alcohol consumption that will probably eventually cause harm. It applies to anyone drinking more than the recommended limits (21 units/week for men, 14 units/week for women; 1 unit=8 g alcohol) or "binge drinking" (8 units/day for men, 6 units/day for women) in the absence of current alcohol related problems. This category is used by WHO and a recent UK review,³ but it is not a diagnostic term in ICD-10 (international classification of diseases, 10th revision)

Harmful drinking

A level or pattern of alcohol consumption that is already causing damage to the person's physical or mental health. This category excludes people with dependence syndrome. Damage may be acute (such as acute pancreatitis) or chronic (such as alcohol related brain damage). Despite evidence of alcohol related problems patients do not usually seek treatment. This category is used as a diagnostic term in ICD-10

Dependent drinking

The key features of dependence in ICD-10 are:

- A strong desire or compulsion to drink
- Difficulties in controlling drinking
- A physiological withdrawal syndrome (tremor, sweating, anxiety, nausea and vomiting, agitation, insomnia)
- Evidence of tolerance
- Neglect of other pursuits because of time spent drinking or recovering from drinking
- Persisting with drinking behaviour despite clear evidence of harm

A diagnosis of dependence is indicated if three or more features were present together during the previous year

Biological markers are helpful when the validity of self reports may be questioned, such as in legal proceedings. They can also provide motivational feedback, monitor change, and be indicators of physical complications. Of the commonly requested biological markers (carbohydrate deficient transferrin, γ glutamyl transferase, and mean corpuscular volume), carbohydrate deficient transferrin has marginally better sensitivity and specificity, but it is inferior to and more expensive than self report screening questionnaires.³ A case exists in trauma departments for routinely measuring blood alcohol concentration, because this is the most reliable biological marker of hazardous drinking in young adults.¹²

What should further assessment entail?

Further assessment is indicated for people with moderate or severe dependence, those with complex needs (such as comorbidity), and if there is serious risk to self or others, especially children. Further assessment will need to consider:

- Quantity (level) and frequency of consumption

Box 2 Improving identification of alcohol use disorders**Tips**

- Remember that hazardous and harmful drinking go undetected most of the time
- Make inquiries about alcohol use part of routine practice
- Do not be judgmental
- Make it easy for the patient to be open and honest
- Use disarming questions (see below)
- Use a validated screening tool, such as fast alcohol screening test (FAST)

Suggested questions⁸

- "I always ask everyone about drinking . . ."
- "It can be important to feel one can talk about one's drinking without being got at . . ."
- "Tell me, have you ever been worried about your drinking? Ever? In any way? I mean, has it led to any rows or troubles at home or at work? Health troubles? Ever thought you ought to cut down? Anyone criticised your drinking?"

- Pattern of consumption
- Severity of dependence
- Alcohol related problems
- Use of other drugs, both prescribed and illicit
- Physical or mental health comorbidity (or both)
- Risk of harm to self or others
- Urgency of treatment
- Motivation or readiness to change
- Sociodemographic factors.

In specialist settings, the severity of alcohol dependence questionnaire (SADQ) is a well validated tool to assess the level of dependence (scores >30 indicate

Box 3 Managing withdrawal in the community

- Assess safety (see table)
- Ensure that daily support is available at home to supervise and monitor withdrawal, ideally round the clock support. If no support is available, twice daily visits by a healthcare professional may be necessary
- Discuss the overall treatment plan with the patient and the person who will support him or her
- Discuss the aims (safety and comfort) of the medically assisted withdrawal plan and complications that would require urgent medical assessment (such as delirium, confusion, seizures, falls, severe nausea or vomiting, and high levels of distress)
- Give the patient and carer details of whom to contact and what to do if they need help
- Inform the patient and carer to stop withdrawal drugs if drinking resumes
- Supply vitamin supplements (see box 6)
- Write this plan down, give a copy to the patient, and send a copy to other healthcare professionals who are involved at that time

Box 4 Brief advice and extended brief interventions**Brief advice: few minutes only**

- Simple structured advice that aims to reduce consumption of alcohol to sensible or less risky levels
- Should be non-judgmental
- Delivered by generalists across medical settings

Extended brief intervention (20-30 minutes; follow-up optional)

- Uses basic skills from motivational interviewing
- Provides the tools to change
- Indicates how to deal with underlying problems
- Ideally delivered by an alcohol health worker
- Opportunistic—given after an alcohol related presentation or routine detection

The FRAMES acronym is useful for both forms of advice¹⁴

- Structured *Feedback* on risk and harm
- Emphasis on the patient's *Responsibility* for change
- Clear *Advice* to make a change in drinking
- Discuss a *Menu* of options for making change
- Express *Empathy* and be non-judgmental
- Reinforce the patient's *Self* efficacy

severe dependence), and the alcohol problems questionnaire (APQ) is useful for measuring alcohol related problems.³

How are alcohol use disorders managed?

For hazardous and harmful drinkers brief interventions are indicated. For those with moderate to severe dependence or dependence with complex needs, more specialist interventions are generally indicated, including medically assisted withdrawal and psycho-social and pharmacotherapy interventions to promote abstinence (figure; table; box 3). People with mild alcohol dependence who experience minimal withdrawal symptoms may still benefit from specialist intervention.

Box 5 Medical management of assisted withdrawal**Mild dependence**

Mild dependence can be managed at home without drugs or very small doses of benzodiazepines

Moderate dependence

Moderate dependence can usually be managed safely at home (box 3), although certain circumstances require inpatient stay (table). Below is a suggested regimen for a community or an inpatient setting:

- Day 1: 20 mg chlordiazepoxide four times daily
- Day 2: 15 mg chlordiazepoxide four times daily
- Day 3: 10 mg chlordiazepoxide four times daily
- Day 4: 5 mg chlordiazepoxide four times daily
- Day 5: 5 mg chlordiazepoxide twice daily
- Severe dependence

Severe dependence requires larger doses of chlordiazepoxide in an inpatient or specialist setting. Intensive daily monitoring is needed for the first two to three days, with dose adjustment as necessary. Caution should be taken when giving benzodiazepines if the patient is highly intoxicated. It is useful to measure alcohol concentrations in the breath at one hourly intervals. If the reading is very high or rising, benzodiazepines should not be given until it begins to fall and clinical signs or symptoms of withdrawal are apparent. Five days of a reduction regimen is usually adequate, using a maximum daily dose of 250 mg of chlordiazepoxide. However, people at high risk of seizures or delirium tremens may need longer (maximum of two weeks). People taking concomitant benzodiazepines (prescribed or otherwise) may need higher doses. See box 6 for advice on vitamin supplements

What are brief interventions?

Brief interventions range from brief advice—primarily for hazardous drinking—to extended brief interventions for harmful drinking. Brief advice requires minimal training, and it is ideal for delivery in primary care and accident and emergency settings by general practitioners and nurses (box 4).

Features indicating high risk of complicated withdrawal

Risk or need for inpatient treatment	Feature
High risk of complicated withdrawal; admission to hospital necessary	Severe dependence
	Previous delirium tremens
	Previous alcohol withdrawal seizures
	Previous failed detoxification(s) in the community
	Poor support at home
Risk determined by further assessment and the level of community support available	Cognitive impairment
	Acute or chronic physical illness (such as infection and diseases of the liver, cardiovascular system, or respiratory system)
	Acute or chronic mental health problems (such as suicidality, depression, anxiety, psychosis, or acute distress)
	Malnutrition
	Self neglect
	Older age

Extended brief intervention is indicated for harmful drinking and requires basic skills in empathic listening and motivational interviewing. It goes beyond brief advice and aims to provide patients with the tools they need to make changes (box 4).¹⁵ Ideally, extended brief interventions should be offered directly after an alcohol related presentation, to take advantage of the “teachable moment.”^{16 17}

A recent Cochrane review of 21 randomised controlled trials showed that brief interventions are effective in routine clinical settings at reducing alcohol consumption in men, with significant reductions maintained at one year follow-up. Their effectiveness is less clear for women.¹⁸

How is medically assisted withdrawal managed?

Medically assisted withdrawal is indicated in alcohol dependence. The main aims of a medically assisted withdrawal are to prevent serious complications, such as delirium tremens and seizures; to make the patient comfortable; and to introduce other interventions that promote and maintain abstinence. Whenever possible, withdrawal from alcohol should be part of an overall treatment plan that includes aftercare and takes account of the person's goals and level of motivation. In general hospitals, however, withdrawal is often unplanned, so an awareness of, and alertness to, the physiological signs and symptoms of withdrawal (box 1) are necessary.

Benzodiazepines are effective at reducing the signs and symptoms of withdrawal and are the drug of choice.¹⁹ Longer acting benzodiazepines such as diazepam and chlordiazepoxide, are also effective at

Box 6 Preventing and treating Wernicke's encephalopathy¹⁹⁻²¹

The *British National Formulary* has recently changed its advice to emphasise that parenteral thiamine is essential in patients at risk of this complication²²

Community setting

Given poor absorption of oral thiamine in dependent drinkers, all those undergoing detoxification in the community should be considered for parenteral high potency B complex vitamins (Pabrinex) as prophylactic treatment. However, because of the risk of anaphylaxis, resuscitation facilities need to be available at the time of administration. The risk of anaphylaxis is lower if the drug is given intramuscularly. If the patient is healthy and well nourished, and alcohol dependence is uncomplicated, then an alternative is oral thiamine at a minimum dose of 300 mg/day during detoxification

Inpatient setting

All inpatients undergoing detoxification should be given Pabrinex according to the following regimens, where a pair of ampoules contains 250 mg of thiamine

Prophylactic treatment

One pair of ampoules of Pabrinex should be given intramuscularly or intravenously once a day for three to five days

Therapeutic treatment of suspected Wernicke's encephalopathy

Wernicke's encephalopathy should be suspected and treated therapeutically in patients undergoing detoxification who have any of the following symptoms: ataxia, hypothermia and hypotension, confusion, ophthalmoplegia or nystagmus, memory disturbance, vomiting, coma, or unconsciousness. Patients with delirium tremens may also have Wernicke's encephalopathy and should be treated for both conditions simultaneously

When Wernicke's encephalopathy is suspected, at least two pairs of ampoules of Pabrinex (500 mg thiamine) should be given intravenously three times daily for three days. If the patient does not respond, treatment should be discontinued. If signs or symptoms respond to treatment, continue with two ampoules of Pabrinex once daily for five days, or for as long as improvement continues

Algorithm for treatment of disorders of alcohol misuse¹³

preventing seizures, although shorter acting benzodiazepines such as oxazepam, are indicated in clinically significant liver disease to prevent accumulation (box 5).

Wernicke's encephalopathy

Wernicke's encephalopathy is a neuropsychiatric complication caused by thiamine deficiency that occurs relatively often in people with chronic alcohol dependence, particularly during alcohol withdrawal. Wernicke's encephalopathy can be prevented and treated by the timely use of parenteral thiamine

ADDITIONAL EDUCATIONAL RESOURCES**Resources for healthcare professionals**

National Treatment Agency for Substance Misuse (www.nta.nhs.uk)—This website contains a downloadable version of a recent review³ and UK policy documents

World Health Organization (www.who.int/substance_abuse/publications/en)—An excellent source of international data on alcohol related harm. The alcohol pages contain a useful downloadable guide to implementing brief interventions, including a self help booklet for patients

Scottish Intercollegiate Guidelines (www.sign.ac.uk)—This site contains useful guidance for managing harmful drinking in primary care

National Institute on Alcohol Abuse and Alcoholism (www.niaaa.nih.gov)—A good source of research information and guidance for patients

Alcohol concern (www.alcoholconcern.org.uk)—A UK organisation that acts as an umbrella for more than 500 local agencies tackling alcohol related harm. A good source of information on trends and policy.

Resources for patients

Down Your Drink (www.downyourdrink.org.uk)—A six week online programme to help misusers reduce drinking and develop safer drinking habits. Free and confidential

Alcoholics Anonymous (www.alcoholics-anonymous.org.uk and www.alcoholics-anonymous.org)—This website lists all meetings, has information about the 12 steps, and contains helpline numbers for newcomers

DrinkAware (www.drinkaware.co.uk)—An excellent modern site with information on the effects of alcohol and safe drinking limits

Al-Anon (www.al-anonuk.org.uk)—Worldwide organisation that provides support for families and friends of those with alcohol problems

supplementation (box 6). It is essential to have a high index of suspicion as the classic triad of confusion, ataxia, and ophthalmoplegia is only present in about 10% of cases, and postmortem evidence suggests that 80% of cases are not diagnosed.¹⁹⁻²¹ Initially Wernicke's encephalopathy is reversible, but if left untreated it can cause permanent brain damage (Korsakoff's psychosis), which is characterised by severe short term memory loss and associated functional impairment that requires permanent institutional care.^{20 21}

What psychosocial interventions are effective?

After detoxification, most people with alcohol dependency will need a specialist psychosocial intervention to reduce the risk of relapse. Non-dependent binge drinkers who do not respond to brief intervention may also benefit from more intensive treatment. Systematic reviews have now

established that a range of psychosocial interventions are clinically effective, with none being superior overall.³ A recent pragmatic randomised trial in seven UK sites has also reported a saving of £5 for every £1 spent on specialist intervention on an outpatient basis.²³ Residential rehabilitation does not have established cost effectiveness, but for some people with severe dependence or complex needs, the period of protected abstinence that it provides may be beneficial, even essential.

Many psychosocial interventions are based on the principles of cognitive behaviour therapy. Such interventions are highly pragmatic and focus on modifying maladaptive beliefs about drinking, learning about high risk situations, and developing problem solving skills and social skills. This family of interventions has the largest research literature on effectiveness.³

Where motivation to change is minimal or changeable, then motivational enhancement therapy is of particular value,¹⁴ and it has been shown to be effective in two major multisite randomised controlled trials.^{23 24}

Other effective psychosocial interventions include the community reinforcement approach and contingency management (both of which use positive reinforcers to reward abstinence),³ and 12 step facilitation therapy, which encourages attendance at Alcoholics Anonymous.^{24 25}

What is the role of mutual self help groups?

Alcoholics Anonymous is by far the most extensive worldwide network of mutual self help groups for alcoholics, with more than 100 000 groups worldwide, and 3000 groups in the UK. The voluntary, non-professional, and long term nature of the fellowship does not readily lend itself to evaluation in randomised controlled trials. However, long term observational studies have established a consistent and strong association between involvement in Alcoholics Anonymous and long term abstinence.²⁶ Furthermore, high quality randomised controlled trials have shown that structured interventions to facilitate engagement with Alcoholics Anonymous, known as 12 step facilitation, are effective at

Ongoing research

Alcohol screening and brief intervention trailblazers (www.sips.sgul.ac.uk)—A UK Department of Health study. The study aims to find the best way to identify people who are drinking in a harmful way at an early stage, to provide advice and support to prevent alcohol related harm, and to assess the cost savings of intervention

Prevention, early identification, and management of disorders of alcohol misuse—A forthcoming clinical guideline commissioned by the UK National Institute for Health and Clinical Excellence

SUMMARY POINTS

Alcohol use disorders account for 4% of the global burden of disease

Most alcohol use disorders go undetected in primary care

The fast alcohol screening test (FAST) is the best screening tool in busy settings

Brief interventions are effective for hazardous and harmful drinking

Specialist interventions are effective in people with alcohol dependence

Most people with alcohol dependence can undergo medically assisted withdrawal safely at home, after risk assessment

promoting abstinence, mostly as a result of increased involvement in Alcoholics Anonymous.^{24,25} Other mutual self help groups exist and may also be effective.²⁶ The evidence indicates that systematic encouragement to attend mutual self help groups is a cost effective way to enhance treatment outcomes, and such encouragement should be part of routine practice for people with alcohol dependence.

What is the role of drugs to prevent relapse?

Three drugs are commonly used to prevent relapse into drinking—disulfiram, which produces an unpleasant reaction if alcohol is consumed; and acamprosate and naltrexone, which reduce cravings. Oral disulfiram (Antabuse) is an effective component of strategies to prevent relapse.³ However, it is not risk free, and is contraindicated in people with cardiovascular disease, hypertension, pregnancy, or a history of cerebrovascular accident or psychosis. Acamprosate and naltrexone are much safer than disulfiram, but naltrexone is unlicensed in the UK for alcohol use disorders. Although most randomised controlled trials show a positive effect, the effect size is small and outcomes vary greatly.³ These three drugs should routinely be considered as adjuncts to psychosocial programmes and self help groups, to enhance the effectiveness of treatment.

What is the long term outcome of alcohol use disorders?

Epidemiological surveys and observational studies clearly show that substantial rates of recovery occur across the spectrum of severity of alcohol use disorders, and that having received treatment is consistently associated with a better outcome compared with no treatment.^{27,28}

Contributors: All three authors helped plan and write this review. AJRP is guarantor.

Competing interests: None declared.

Provenance and peer review: Commissioned; externally peer reviewed.

- WHO. *Global status report on alcohol*. 2004. www.who.int/substance_abuse/publications/global_status_report_2004_overview.pdf.
- Department of Health. *Models of care for alcohol misusers*. London: Stationery Office, 2006.
- Raistrick D, Heather N, Godfrey C. *Review of the effectiveness of treatment for alcohol problems*. London: National Treatment Agency for Substance Misuse, 2006.
- Department of Health. *Alcohol needs assessment research project (ANARP): the 2004 national alcohol needs assessment for England*. London: Stationery Office, 2005.
- Leon D, McCambridge J. Liver cirrhosis mortality rates in Britain from 1950 to 2002: an analysis of routine data. *Lancet* 2006;367:52-6.
- Kaner E, Heather N, McAvooy B, Lock C, Gilvarry E. Intervention for excessive alcohol consumption in primary health care: attitudes and practices of English general practitioners. *Alcohol Alcohol* 1999;34:559-66.
- Prime Minister's Strategy Unit. *Alcohol harm reduction strategy for England*. London: Stationery Office, 2004.
- Edwards G, Marshall EJ, Cook CCH. *The treatment of drinking problems: a guide for the helping professions*. 4th ed. Cambridge: Cambridge University Press, 2003.
- WHO. *AUDIT—the alcohol use disorders identification test: guidelines for use in primary care*. 2nd ed. 2001. www.who.int/substance_abuse/publications/alcohol/en/.
- Hodgson R, Alwyn T, John B, Thom B, Smith A. The FAST alcohol screening test. *Alcohol Alcohol* 2002;37:61-6.
- Smith SGT, Touquet R, Wright S, Das Gupta N. Detection of alcohol misusing patients in accident and emergency departments: the Paddington alcohol test (PAT). *J Accid Emerg Med* 1996;13:308-12.
- Savola O, Niemela O, Hillbom M. Blood alcohol is the best indicator of hazardous alcohol drinking in young adults and working-age patients with trauma. *Alcohol Alcoholism* 2004;39:340-5.
- Room R, Babur T, Rehm J. Alcohol and public health. *Lancet* 2005;365:519-30.
- Miller W, Sanchez V. Motivating young adults for treatment and lifestyle change. In: Howard G, ed. *Issues in alcohol use and misuse by young adults*. Notre Dame, IN, USA: University of Notre Dame Press, 1994:55-82.
- WHO. *Brief intervention for hazardous and harmful drinking: a manual for use in primary care*. 2001. www.who.int/substance_abuse/publications/alcohol/en/.
- Williams S, Brown A, Patton R, Crawford MJ, Touquet R. The half-life of the "teachable moment" for alcohol misusing patients in the emergency department. *Drug Alcohol Depend* 2005;77:205-8.
- Crawford MJ, Patton R, Touquet R, Drummond C, Byford S, Barrett B, et al. Screening and referral for brief intervention of alcohol-misusing patients in an emergency department: a pragmatic randomised controlled trial. *Lancet* 2004;364:1334-9.
- Kaner EFS, Beyer F, Dickinson HO, Pienaar E, Campbell F, Schlesinger C, et al. Effectiveness of brief alcohol interventions in primary care populations. *Cochrane Database Syst Rev* 2007;(2):CD004148.
- Lingford-Hughes A, Welch S, Nutt D. Evidence based guidelines for the pharmacological management of substance misuse, addiction, and co-morbidity: recommendations from the British Association for Psychopharmacology. *J Psychopharmacol* 2004;18:293-335.
- Thomson AD, Marshall EJ. The natural history and pathophysiology of Wernicke's encephalopathy and Korsakoff's psychosis. *Alcohol Alcohol* 2006;41:151-8.
- Thomson AD, Marshall EJ. The treatment of patients at risk of developing Wernicke's encephalopathy in the community. *Alcohol Alcohol* 2006;41:159-67.
- Joint Formulary Committee. *British national formulary*. 54th ed. London: British Medical Association and Royal Pharmaceutical Society of Great Britain, 2007.
- UKATT Research Team. Effectiveness of treatment for alcohol problems: findings of the randomised UK alcohol treatment trial (UKATT). *BMJ* 2005;311:541-4.
- Project MATCH Research Group. Matching alcoholism treatment to client heterogeneity: project MATCH post treatment drinking outcomes. *J Stud Alcohol* 1997;58:7-29.
- Timko C, DeBenedetti A, Billow R. Intensive referral to 12-step self-help groups and 6-month substance use disorder outcomes. *Addiction* 2006;101:678-88.
- Humphreys K. *Circles of recovery: self-help organisations for addictions*. Cambridge: Cambridge University Press, 2004.
- Dawson SA, Grant BF, Stinson FS, Chou PS, Huang B, Ruan WJ. Recovery from DSM-IV alcohol dependence: United States, 2001-2002. *Addiction* 2005;100:281-92.
- Timko C, Moos RH, Finney JW, Lesar MD. Long-term outcomes of alcohol use disorders: comparing untreated individuals with those in alcoholics anonymous and formal treatment. *J Stud Alcohol* 2000;61:529-40.