

Prevalence and Impact of Alcohol Dependence

Michael J. Bohn, M.D., and Robert M. Swift, M.D., Ph.D.

Alcohol dependence has a high prevalence in the United States, with approximately 18 million people dependent on or abusing alcohol. Misuse of alcohol is associated with great financial costs and high rates of morbidity and mortality. Alcohol disorders can be treated as effectively as other chronic diseases, such as asthma, diabetes, or coronary heart disease, yet problem drinking is not well recognized and remains undertreated. Although validated screening instruments and biochemical markers can help identify patients with drinking disorders, many physicians are unaware of their patients' hazardous, abusive, or dependent alcohol use. Research shows that early screening is feasible, has proved useful in helping make a diagnosis of alcoholism, and can have significant benefit on health care costs. Like other chronic relapsing conditions, alcohol disorders are both preventable and treatable. Early screening has great potential to decrease alcohol-induced health risks and economic burden. Clinicians should routinely screen persons for alcohol use to identify not only those with alcohol dependence but also early-stage problem drinkers. (*J Clin Psychiatry* 2006;67[suppl 14]:6-13)

Excessive alcohol consumption is a major public health problem and has considerable social and medical costs. Like several other chronic conditions, such as asthma, diabetes, or coronary heart disease, alcoholism is common, has both genetic and behavioral components, and can be reliably diagnosed. Unfortunately, unlike other chronic illnesses, problem drinking is often not recognized by physicians across many types of medical settings, preventing implementation of an appropriate treatment plan. Several effective, brief screening instruments are available to physicians for identifying problem drinkers. Studies have shown that regular use of these screening instruments, combined with brief interventions to address drinking, can have enormous social and medical cost benefits.¹⁻³ Despite the ease of screening patients with drinking problems, alcohol disorders are not well recognized and remain undertreated.

This article describes risky, hazardous, and harmful patterns of drinking and reviews diagnostic criteria for alcohol dependence and alcohol abuse. Recent data on the prevalence of alcohol disorders and the impact these disorders have on morbidity, mortality, and injuries are summarized. Brief screening instruments and biochemical laboratory tests for the identification of problem drinkers are

reviewed, and cost benefits and health benefits of using early screening and brief intervention are highlighted.

DEFINITIONS

Alcohol abuse and dependence are associated with deleterious physical, psychological, and social effects. Clinicians and researchers rely on the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (DSM-IV-TR) for the diagnostic criteria of alcohol dependence and abuse.⁴ The DSM-IV-TR identifies 7 necessary criteria (symptoms) for the diagnosis of alcohol dependence (Table 1), at least 3 of which must be met during a given 12-month period. Alcohol abuse is diagnosed in patients if they do not meet at least 3 of the DSM-IV-TR criteria for alcohol dependence but have used alcohol in situations when it is physically hazardous or in such a way that they fail to fulfill major obligations or have persistent interpersonal or legal problems.⁴ DSM-IV-TR diagnoses are similar to the ICD-10 classification of alcohol problems developed by the World Health Organization, although there are some differences. The World Health Organization defines hazardous drinking as a drinking pattern that poses a high risk of future damage to physical or mental health.⁵

Misuse of alcohol has also been described as "risky" and "harmful."⁶ These terms describe individuals' drinking patterns and behavior that may not meet DSM-IV-TR criteria for alcohol dependence or abuse but that nevertheless suggest risk of harm from alcohol consumption. Risky or hazardous drinking has been defined in the United States as more than 7 standard drinks per week or more than 3 standard drinks per occasion for women and more than 14 standard drinks per week or more than 4 standard

From Aurora Psychiatric Hospital, Wauwatosa, Wis. (Dr. Bohn); and the Department of Psychiatry and Human Behavior, Brown University Medical School, and Providence VA Medical Center, Providence, R.I. (Dr. Swift).

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Corresponding author and reprints: Michael J. Bohn, M.D., Aurora Psychiatric Hospital, 1220 Dewey Ave., Wauwatosa, WI 53213 (e-mail: michael.bohn@aurora.org).

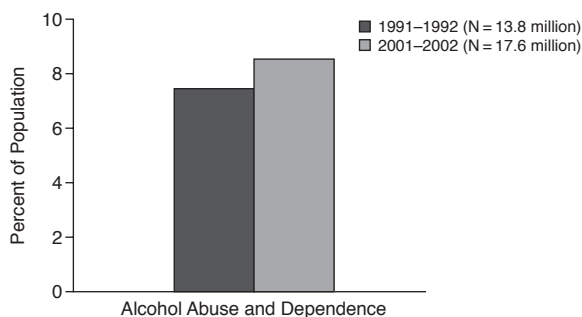
Table 1. DSM-IV-TR Diagnostic Criteria for Substance Dependence^a

A maladaptive pattern of substance use, leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period.

- (1) tolerance, as defined by either of the following:
 - (a) a need for markedly increased amounts of the substance to achieve intoxication or desired effect
 - (b) markedly diminished effect with continued use of the same amount of the substance
- (2) withdrawal, as manifested by either of the following:
 - (a) the characteristic withdrawal syndrome for the substance
 - (b) the same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms
- (3) the substance is often taken in larger amounts or over a longer period than was intended
- (4) there is a persistent desire or unsuccessful efforts to cut down or control substance use
- (5) a great deal of time is spent in activities necessary to obtain the substance (eg, visiting multiple doctors or driving long distances), use the substance (eg, chain-smoking), or recover from its effects
- (6) important social, occupational, or recreational activities are given up or reduced because of substance use
- (7) the substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance (eg, current cocaine use despite recognition of cocaine-induced depression, or continued drinking despite recognition that an ulcer was made worse by alcohol consumption)

^aReprinted with permission from the *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision (Copyright 2000). American Psychiatric Association.⁴

Figure 1. Prevalence of Alcohol Use and Dependence in the United States: Results From the National Institute on Alcohol Abuse and Alcoholism's National Epidemiologic Survey on Alcohol and Related Conditions^a



^aData from Grant et al.¹⁰

drinks per occasion for men.⁶ A “standard drink” unit is a convenient method to quantitate alcohol consumption and contains approximately 0.50 oz or 12 g of absolute alcohol and is equivalent to 12 oz of beer (with an alcohol content of 4%), 6 oz of wine (with an alcohol content of 10%), and a 1.25-oz shot of hard liquor (with an alcohol content of 40%).

Epidemiologic studies have suggested that the consumption of low doses of alcohol may have health benefits, particularly with respect to cardiovascular disease.⁷ For men and women, all-cause mortality is lowest for men who consume fewer than 5 standard drinks per week and women who consume fewer than 2 standard drinks per week.¹ To some extent, this reduction in cardiovascular mortality is offset by higher rates of trauma and liver disease.⁸ Some clinicians recommend that their patients consume alcoholic beverages in moderation. However, prospective, evidence-based studies on the health benefits of

moderate drinking have not been conducted, and the practice has not been endorsed by medical experts.

PREVALENCE AND IMPACT

Alcohol abuse and alcohol dependence are common disorders in the United States. The National Epidemiological Survey on Alcohol and Related Conditions, the largest survey ever conducted (2001–2002) on the subject of alcohol use and co-occurring conditions, showed that the prevalence of alcohol abuse was 4.65% and dependence was 3.81% among 43,093 American adults 18 years of age or older.⁹ This translates to roughly 9.7 million with abuse and 7.9 million with dependence, respectively, across the adult population in the United States. This survey, directed by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), also found that the prevalence of alcohol abuse or dependence increased from 13.8 million in 1991–1992 to 17.6 million in 2001–2002 (Figure 1).¹⁰

Alcohol use disorders are common in general medical patient populations. In Wisconsin, approximately 22% of mixed rural and urban primary care (PC) patients drank above the NIAAA-recommended limits for alcohol, defined as 7 drinks a week for women and 14 drinks a week for men.¹¹ In this study, 21,282 patients completed health questionnaires as they waited in the reception area for regularly scheduled appointments with their family physicians. Results from these questionnaires showed that 38% were low-risk drinkers, 9% were at-risk drinkers, 8% were alcohol abusers, and 5% were alcohol dependent, while the remaining 40% were abstinent.¹¹ The prevalence of hazardous drinkers, i.e., those whose alcohol consumption increases their risk of physical and psychological harm,⁵ has also been investigated in the PC setting.¹ One in 10 PC patients was identified as fitting the category of “hazard-

Table 2. Similar Characteristics of Selected Chronic Diseases

Characteristic	Disease			
	Lifetime Asthma	Alcohol Dependence or Abuse	Diabetes	Coronary Heart Disease
Prevalence (millions) ^a	21.9 ¹⁶	17.6 ¹⁰	18.2 ¹⁷	13.0 ¹⁸
Genetic component	Yes ¹⁹	Yes ²⁰	Yes ²¹	Yes ²²
Controllable behavior change	Yes	Yes	Yes	Yes
Controllable risk factors	Yes: limit exposure to allergens, etc	Yes: limit drinking	Yes: monitor diet; engage in regular exercise	Yes: limit fat, salt intake; engage in regular exercise

^aPrevalence data are for 2002.

ous drinkers and drug users,” and 7.5% of patients were identified as “hazardous drinkers” in a sample of 1419 patients from health maintenance organization PC clinics.¹

Misuse of alcohol has a significant impact on injury, morbidity, and mortality. Alcohol consumption was the third leading cause of death in 2000 (85,000 deaths, or 3.5% of total U.S. deaths, not including motor vehicle deaths attributed to alcohol).¹² Alcohol abuse is associated with significant morbidity, as demonstrated by its causal relationship to more than 60 different medical conditions, with the pattern of drinking (especially irregular heavy drinking) accounting for most of the burden of disease.¹³ Patients treated in the emergency department for an unintentional injury are approximately 13.5 times more likely to have consumed 6 alcoholic beverages within 6 hours of injury, compared with controls matched for age and sex.¹⁴ It is well known that alcohol is a major factor in fatal driving crashes. According to the National Highway Traffic Safety Administration, in 2002, 39% of fatal automobile accidents, 42% of motorist deaths in vans or light trucks, and 44% of motorcycle deaths were related to alcohol consumption.¹⁵ These numbers represented slight elevations over the previous 3 years, indicating that alcohol misuse remains a common and costly problem.

TREATING ALCOHOL DISORDERS AS A CHRONIC DISEASE

Alcohol abuse and dependence, like other chronic conditions such as asthma, diabetes, and coronary heart disease, are diagnosable disorders. And like these other chronic conditions, alcohol disorders are common, have strong genetic and behavioral components, can be managed effectively with changes in behavior, and have similar patterns of symptom control (Table 2).^{10,16–22} Another point of similarity is the significant impact that alcohol disorders and chronic diseases have on total economic burden; for example, alcohol abuse and diabetes both cost billions of dollars annually (\$185 billion [1998] and \$132 billion [2002]) in missed time from work, direct health care costs, and elsewhere.^{17,23}

Although highly prevalent, alcohol dependence and alcohol abuse are both preventable and treatable. Like other chronic relapsing conditions, such as asthma, diabetes,

and coronary heart disease, alcohol abuse and dependence can be identified with reliable diagnostic methods. Nonetheless, alcohol dependence is undertreated. Only 10% of the recommended care for alcohol-dependent patients is received, which is significantly lower than rates of received recommended care for other chronic diseases with similar prevalences (Figure 2).²⁴

Early identification of alcohol abuse or dependence is important, because many diseases are influenced by alcohol consumption and because alcohol consumption has an enormous impact on medical costs. The most recent report on medical costs (1998) indicates that the cost of treating adverse medical consequences of alcohol consumption was \$18.9 billion.²³ Even so, identification by physicians of patients with alcohol problems remains poor.²⁵ For example, in 1 study, physicians detected alcohol problems in 63% of patients, and only 24% of these patients received treatment once they were identified.²⁶ Persistent problems in detection, assessment, and diagnosis may be widespread, as reported by several studies showing lack of screening and intervention for patients in general hospital settings.^{27–30} Physicians are well positioned to detect patients who may need treatment for their alcohol-related problems, and several relatively brief screening instruments, including written questionnaires, are available for this purpose.

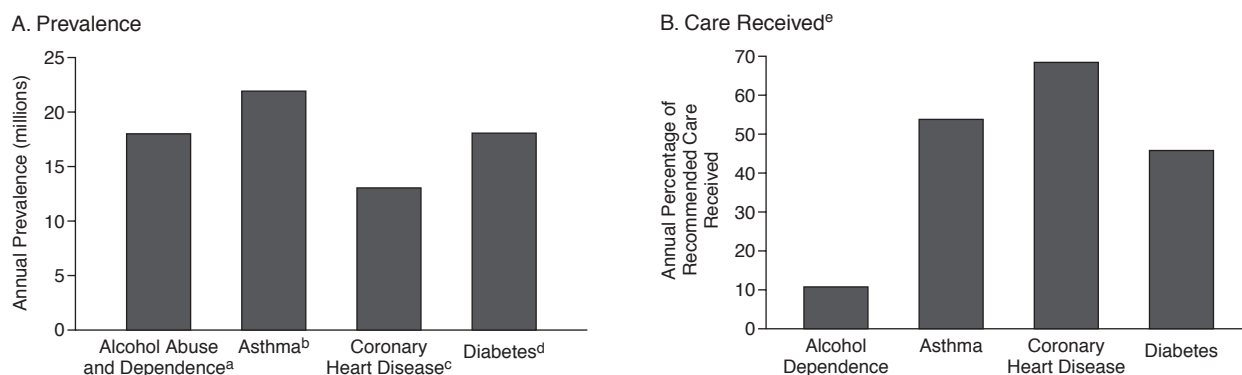
ALCOHOL SCREENING IN CLINICAL SETTINGS

Two types of alcohol screening instruments are available to help physicians identify patients who may need treatment for alcohol misuse. These include self-report questionnaires and clinical laboratory tests that can detect biochemical changes associated with excessive alcohol use.

Alcohol Screening Questionnaires

Given the high prevalence of drinking problems, it is important for clinicians to be able to rapidly identify patients who may need more extensive assessment of their drinking problems. Physicians tend to be poor at identifying problem alcohol use and referring patients for treatment.^{31,32} Obtaining information about a patient’s alcohol consumption with quantity and frequency questions such

Figure 2. Annual Prevalence of Alcohol Abuse and Dependence Versus Other Chronic Diseases in Adults (A) and Annual Percentage of Recommended Care Received (B)



^aData from Grant et al.¹⁰

^bData from Asthma Prevalence, Health Care Use and Mortality 2002.¹⁶

^cData from Cardiovascular Disease Statistics.¹⁸

^dData from National Diabetes Fact Sheet.¹⁷

^eData from McGlynn et al.²⁴

Table 3. CAGE Addiction Assessment^a

1. Have you ever felt you should cut down on your drinking?
2. Have you ever felt annoyed by criticism of your drinking?
3. Have you ever felt bad or guilty about your drinking?
4. Have you ever taken a drink first thing in the morning (eye-opener) to steady your nerves or to get rid of a hangover?

^aAdapted with permission from Mayfield et al.³⁴

as “how much?” and “how often?” are not especially effective in detecting problem use, particularly in heavy drinkers. A more effective strategy focuses on whether the patient has experienced negative consequences from use of psychoactive substances, has poor control of use, or has been criticized by others about his or her substance use. Several validated screening tools that utilize this strategy can be used to identify patients with alcohol disorders. This article discusses 3 written questionnaires that are easy to learn and that can be administered and evaluated in less than 5 minutes. Once the patient is identified, standard diagnostic criteria can be used to confirm whether the patient has an alcohol disorder.³³

The first is the CAGE questionnaire, which was developed in 1970 by Dr. John A. Ewing and comprises 4 questions based on the acronym C-A-G-E (Table 3).^{33,34} A total of 2 or more positive answers indicates a positive history of alcohol dependence³³; however, the CAGE may fail to identify many patients with hazardous drinking habits who are not alcohol dependent, and it does not distinguish between past and active drinking.^{35,36}

The Alcohol Use Disorders Identification Test (AUDIT) is a 10-item questionnaire designed by the World Health Organization in 1989 to screen for hazardous alcohol intake in primary care settings (Table 4).³⁷ The

AUDIT questionnaire was specifically developed to identify patients with a recent history of heavy drinking³⁸ as well as alcohol dependence and has been shown to be significantly better than the CAGE questionnaire as a screening test for heavy drinking and active alcohol abuse or dependence.³⁵ The AUDIT questionnaire takes approximately 2 minutes to administer and 2 minutes to score. A score of 0 to 5 is used for each question, and a cutoff score of 8 has been shown to have sufficient sensitivity to detect alcohol-use disorders.^{38,39}

The AUDIT Alcohol Consumption Questions (AUDIT-C) is an abbreviated form of the AUDIT questionnaire, made up of only 3 questions (Table 5). The AUDIT-C is scored on a scale of 0 to 12, in which 0 reflects no alcohol use. In men, a score of 4 or more is considered positive; in women, a score of 3 or more is considered positive.⁴¹ Generally, the higher the AUDIT-C score, the more likely it is that the patient’s drinking is affecting his or her health and safety. The AUDIT-C was found to be a practical and valid PC screening test for heavy drinking, or for active alcohol abuse or dependence.⁴⁰

Clinical Laboratory Tests

Clinical laboratory tests can be used to provide objective information about a person’s alcohol use independent of the patient’s self-report questionnaire. For screening purposes, questionnaires have greater sensitivity and specificity than do clinical laboratory tests.⁴² However, clinical laboratory tests can be useful for validating responses on questionnaires as well as for monitoring the effects of alcohol consumption or liver damage in certain patients.

Traditional liver-function tests (γ -glutamyl transferase [GGT], aspartate aminotransferase [AST], and alanine

Table 4. Alcohol Use Disorders Identification Test (AUDIT)^a

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."

1. How often do you have a drink containing alcohol?
 - (0) Never
 - (1) Monthly or less
 - (2) 2–4 times per month
 - (3) 2–3 times per week
 - (4) 4 or more times per week
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
3. How often do you have six or more drinks on occasion?
 - (0) Never
 - (1) Less than monthly
 - (2) Monthly
 - (3) Weekly
 - (4) 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?
 - (0) Never
 - (1) Less than monthly
 - (2) Monthly
 - (3) Weekly
 - (4) 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?
 - (0) Never
 - (1) Less than monthly
 - (2) Monthly
 - (3) Weekly
 - (4) 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?
 - (0) Never
 - (1) Less than monthly
 - (2) Monthly
 - (3) Weekly
 - (4) Daily or almost daily
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
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
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
10. Has a relative or friend, or a doctor or other health worker been concerned about your drinking or suggested you cut down?
 - (0) No
 - (2) Yes, but not in the last year
 - (4) Yes, during the last year

^aReprinted with permission from Babor et al.³⁷

Table 5. AUDIT-C Questions^a

1. How often did you have a drink containing alcohol in the past year?

Never	(0 points)
Monthly or less	(1 point)
2 to 4 times a month	(2 points)
2 to 3 times per week	(3 points)
4 or more times a week	(4 points)
2. How many drinks did you have on a typical day when you were drinking in the past year?

1 or 2	(0 points)
3 or 4	(1 point)
5 or 6	(2 points)
7 to 9	(3 points)
10 or more	(4 points)
3. How often did you have 6 or more drinks on 1 occasion in the past year?

Never	(0 points)
Less than monthly	(1 point)
Monthly	(2 points)
Weekly	(3 points)
Daily or almost daily	(4 points)

^aBush et al.⁴⁰

aminotransferase [ALT] in serum) and the mean corpuscular volume (MCV) of erythrocytes are considered standard diagnostic tests to identify long-term alcohol exposure. Carbohydrate-deficient transferrin (CDT), an alcohol biomarker approved by the U.S. Food and Drug Administration (FDA) in 2001, is also used to detect and monitor alcohol consumption. Levels of GGT are elevated in approximately two thirds of long-term heavy drinkers, ALT and AST levels are elevated in approximately one half of long-term heavy drinkers, the MCV is elevated in about one quarter of long-term heavy drinkers, and CDT levels are elevated in about 80% of people who drink heavily every day for 1 week or longer.⁴³ GGT is thought to be the most sensitive of the traditional liver-function tests.^{42,44} The disadvantage of the traditional liver-function tests and MCV test is that they have low sensitivity for recent excessive intake, and raised levels may result from causes other than heavy drinking, such as all types of liver diseases.⁴⁵ Elevated CDT levels have also been correlated with several non-alcohol-related variables (end-stage liver disease, individual genetic variations) in addition to other factors that raise transferrin levels, such as iron deficiency.⁴⁶

In general, CDT has been found to be at least as sensitive as and maybe more specific than GGT in detecting heavy alcohol consumption.^{45,47–49} Healthy individuals usually have GGT and CDT levels lower than 35 U/L and 20 U/L, respectively. Laboratory test results higher than normal levels for either biomarker should prompt the physician to investigate reasons for the elevations and to administer a questionnaire to determine whether drinking patterns might be the cause.⁵⁰ It may be useful to test patients for both CDT and GGT levels, as some patients show an elevation of one but not the other.^{48,50} Use of a

combination of biochemical markers and screening questionnaires prevents false-negative results. For example, 1 study examining the combination of AUDIT and biochemical tests to screen for alcohol problems found that had AUDIT been used alone, without the markers, the number of positive screens would have fallen by almost one half.⁵¹ On the other hand, by using only the biological markers GGT and CDT without the AUDIT questionnaire, the investigators would have missed about a third of positive results.

INTERVENTIONS AND REFERRAL

After identifying alcohol abuse or substance dependence, the clinician should provide feedback on diagnosis and treatment options and assess the individual's readiness to engage in treatment. Studies show that alcoholism treatment can be extremely effective in reducing alcohol consumption and cost-effective in reducing costs.⁵² It is estimated that approximately 18 million persons need treatment for alcoholism. However, only about 1 million individuals receive treatment, so there is a large gap between need and demand for treatment.⁵³ Even when treatment is recommended, financial reimbursement for treatment can be minimal or nonexistent.

Historically, physicians who do not specialize in addiction treatment have felt ill-prepared to contend with substance abuse and dependence.^{31,54} However, several methods have been developed to help physicians successfully intervene with patients. *The Physicians' Guide to Helping Patients With Alcohol Problems*, recently released by the NIAAA, presents several useful intervention methods.^{55,56}

Brief interventions conducted in a supportive manner have been shown to be extremely effective in enhancing entrance into alcoholism treatment. Such interventions can consist of 1 or more sessions in the clinician's office, during which education about substance use and dependence is provided and a plan for cutting down or eliminating substance use is negotiated. Together, the patient and physician should develop a written contract that defines the treatment and intervention plan. A formal assessment of effectiveness and follow-up should be part of the plan. Motivational interviewing is a technique that identifies and motivates patients to use their own treatment resources and has been shown to be an effective intervention to reduce the use of alcohol. Those patients with severe dependence or requiring detoxification may be referred to a specialized addiction treatment program or an addiction treatment professional. In that case, the clinician should remain in contact with the patient, the family, and the other clinicians in order to maintain continuity of care and to help coordinate treatment. Pharmacotherapy with the FDA-approved treatments for alcohol dependence—disulfiram; oral naltrexone; injectable, extended-release formulation of naltrexone; or acamprosate—should also

be considered along with the psychosocial treatment. Patients should also be encouraged to utilize self-help groups such as Alcoholics Anonymous.

REDUCED MORBIDITY AND MORTALITY AND COST SAVINGS FROM SCREENING AND INTERVENTION

There is a growing recognition of the importance of early screening and intervention for patients with drinking problems, even at the earliest stage of drinking. Brief alcohol interventions are extremely effective in reducing deleterious alcohol-related health complications and health care costs in PC populations.^{57,58} Recent research has shown that PC patients who engage in hazardous drinking and those who are drug users have very serious health problems. Researchers screened 1419 Kaiser Permanente PC patients and found that patients who were "hazardous drinkers" or drug users or both (about 10%) had higher rates of health problems, including injuries, hypertension, pneumonia, chronic obstructive pulmonary disease, depression, anxiety disorders, and major psychoses.¹ Further, these patients paid more visits to psychiatric clinics, with resulting higher costs and levels of medical care utilization relative to other patients. Total PC visit costs for this group were \$15.63 higher per member per month (i.e., about \$188 more per year) compared with other patients, after controlling for age and gender. These results suggest that intervention at the earliest stages of drinking may have long-term cost benefits because of the potential to reduce utilization of medical care.¹

Brief interventions have been shown in 1 randomized controlled clinical trial (Project TrEAT, or Trial for Early Alcohol Treatment)⁵⁹ to decrease alcohol consumption for at least 12 months, cut health care utilization, and reduce societal and health costs. Of the 17,695 patients screened for problem drinking, men who drank more than 14 drinks per week and women who drank more than 11 drinks per week were randomly assigned to a control (N = 382) or an intervention group (N = 392). Intervention consisted of two 10- to 15-minute counseling sessions, delivered by physicians, that included a scripted workbook. After 12-month follow-up, the frequency of excessive drinking over the previous 7 days and the number of binge-drinking episodes over the previous 30 days were lower in the group receiving the intervention compared with controls. Men in the control group also reported hospitalization times that were twice as long as hospitalization times for men who had received intervention.

The economic ramifications of these differences in health care utilization were calculated in a follow-up study.² The total economic benefit (including outcomes for emergency department use, hospital use, and motor vehicle accidents) of the brief intervention was \$432,519. The average benefit for each patient was \$1151, while the economic cost of the intervention was \$80,210, or \$205

per patient. The analyses from this study suggest that investment in screening and brief intervention has a positive benefit on medical costs.

While studies have shown that brief interventions for injured patients who require emergency or inpatient trauma services can decrease future alcohol intake and prevent repeated alcohol-related injuries, the economic impact of the interventions has not been studied extensively.³ A cost-benefit analysis using published data and a decision-analysis model showed that 27% of injured adults treated in an emergency department, representing 5.5 million visits per year, screen positive for unhealthy alcohol use and are potential candidates for brief interventions.³ Interventions offered to this population would lower health costs by \$89 dollars per patient screened, or \$330 for each person who underwent intervention. Routinely offered interventions for eligible trauma patients in the United States could produce a net savings of \$1.82 billion dollars annually.³ These data suggest that screening and brief intervention in a trauma-patient population with alcohol problems are cost-effective and should be routinely provided.

Recent studies in Germany suggest that the use of screening to identify surgical patients with alcohol problems and the institution of brief interventions to reduce alcohol use prior to surgery can decrease morbidity and mortality of surgical patients.⁶⁰⁻⁶² Identified alcoholics who receive brief interventions to reduce their drinking prior to surgery experience fewer postoperative infections, fewer bleeding episodes, shorter intensive care unit stays, and fewer postoperative deaths.

CONCLUSIONS

Unhealthy alcohol use is associated with many health problems and has a significant impact on morbidity, mortality, and total economic burden. Like other chronic diseases, alcohol disorders can be prevented and treated with proper counseling and treatment intervention. Improved awareness of alcohol misuse and increased use of screening tools, including biochemical markers, can facilitate early intervention for and successful management of patients with drinking problems. Implementing this treatment strategy may have substantial medical cost benefits.

Drug names: acamprosate (Campral), disulfiram (Antabuse), naltrexone (ReVia, Vivitrol, and others).

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents that is outside U.S. Food and Drug Administration–approved labeling has been presented in this article.

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