Hazardous and Harmful Alcohol Consumption in Primary Care

M. Carrington Reid, PhD, MD; David A. Fiellin, MD; Patrick G. O'Connor, MD, MPH

Increasing emphasis has been placed on the detection and treatment of hazardous and harmful drinking disorders, particularly among patients who are seen in primary care settings. In this review, we summarize the epidemiology and health-related effects of hazardous and harmful drinking and discuss current methods for their detection and treatment. Hazardous drinking is defined as a quantity or pattern of alcohol consumption that places patients at risk for adverse health events, while harmful drinking is defined as alcohol consumption that results in adverse events (eg, physical or psychological harm). Prevalence estimates range from 4% to 29% for hazardous drinking and from less than 1% to 10% for harmful drinking. Data from several recent large prospective studies suggest that alcohol consumption in quantities consistent with hazardous or harmful drinking may increase risk for adverse health events, such as hemorrhagic stroke and breast cancer. Existing screening instruments, such as the Michigan Alcoholism Screening Test (MAST) or the CAGE questionnaire, while excellent for detecting alcohol abuse or dependence, should not be used alone to screen for hazardous and harmful drinking. The Alcohol Use Disorders Identification Test (AUDIT) is currently the only instrument specifically designed to identify hazardous and harmful drinking. Treatment of these disorders in the form of brief interventions can be successfully accomplished in primary care settings, as demonstrated by a number of well-conducted randomized trials. Given its proven efficacy in the primary care setting, we recommend routine application of this treatment approach.

Alcohol use disorders (AUDs) are a recognized cause of significant morbidity and mortality in the US population.1 These disorders are heterogeneous and include severe problems, such as alcohol abuse or dependence, as well as less severe disorders, often referred to as heavy, hazardous, or harmful drinking. Although alcohol abuse and dependence have historically received the greatest attention, increasing emphasis has been placed on the detection2-4 and treatment5,6 of less severe AUDs, particularly in primary care settings.2-6 This change in focus has occurred in part because of reports that heavy, hazardous, and harmful drinking are more common and may be more responsive to treatment2-4 than alcohol abuse or dependence. In this article, we review the epidemiology and health-related effects of these drinking disorders and summarize current methods for their detection and treatment.

Table 1 lists the various categories of AUDs and their definitions as used in this review. These categories reflect the clinical reality that drinking problems occur over a broad continuum, ranging from alcohol consumption that can result in profound physical and psychological impairment (alcohol dependence) to less severe disorders (heavy or hazardous drinking).

DEFINITION OF HEAVY DRINKING

Heavy drinking is defined as a quantity of alcohol consumption that exceeds an established threshold value. The National In-
DEFINITION OF HAZARDOUS DRINKING

Hazardous drinking is defined as a quantity or pattern of alcohol consumption that places individuals at risk for adverse health events and is recognized by the World Health Organization (WHO) as a distinct disorder. The quantity or pattern of alcohol consumption that constitutes hazardous drinking is also typically specified by setting threshold values for an individual's average number of drinks consumed per week or per occasion. For example, in a recent study that examined the efficacy of the Alcohol Use Disorders Identification Test (AUDIT), hazardous drinking was defined as an average consumption of 21 drinks or more per week for men (or ≥7 drinks per occasion at least 3 times a week), and 14 drinks or more per week for women (or ≥5 drinks per occasion at least 3 times a week).

Because hazardous and heavy drinking are similarly defined (i.e., a quantity or pattern of alcohol consumption that exceeds a specific threshold and may increase risk for adverse health events), we will use 1 term, hazardous drinking, to define this type of drinking disorder.

DEFINITION OF HARMFUL DRINKING

Harmful drinking is defined as alcohol consumption that results in physical or psychological harm. This disorder is also recognized by the WHO and is defined by criteria of the International Classification of Diseases, 10th Revision (ICD-10), which include (1) clear evidence that alcohol is responsible for physical or psychological harm, (2) the nature of the harm is identifiable, (3) alcohol consumption has persisted for at least 1 month or has occurred repeatedly over the previous 12-month period, and (4) the individual does not meet the criteria for alcohol dependence.

EPIDEMIOLOGY OF HAZARDOUS AND HARMFUL DRINKING

Prevalence estimates for hazardous and harmful drinking are shown in Table 2 and Table 3, along with information regarding the various study settings, populations, and definitions used to classify these disorders. Most of these studies also determined prevalence rates for alcohol

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Table 1. Alcohol Use Disorder Definitions*  

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dependence</td>
<td>At least 3 of the following: tolerance; withdrawal symptoms; impaired control; preoccupation with acquisition and/or use; persistent desire or unsuccessful efforts to quit; sustains social, occupational, or recreational disability; use continues despite adverse consequences</td>
</tr>
<tr>
<td>Abuse</td>
<td>At least 1 of the following: fails to fulfill occupational or social obligations due to drinking; use occurs in physically hazardous situations or leads to recurrent legal problems; use continues despite persistent social or interpersonal problems</td>
</tr>
<tr>
<td>Harmful drinking</td>
<td>Clear evidence that alcohol is causing physical or psychological harm; nature of the harm is clearly identifiable; alcohol use has persisted at least 1 month or has occurred repeatedly over the past 12-month period; subject does not meet criteria for alcohol dependence</td>
</tr>
<tr>
<td>Hazardous drinking</td>
<td>Quantity or pattern of use that places patients at risk for adverse consequences</td>
</tr>
<tr>
<td>Heavy drinking</td>
<td>Quantity or pattern of use that exceeds a defined threshold</td>
</tr>
</tbody>
</table>

*From the Diagnostic and Statistical Manual of Mental Disorders, Revised Third Edition (DSM-III-R); the International Classification of Diseases, 10th Revision (ICD-10); and the World Health Organization.

Table 2. Prevalence Estimates for Alcohol Use Disorders From Population-Based Studies

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Setting or Survey</th>
<th>Study Population</th>
<th>No.</th>
<th>Type of Drinking Disorder</th>
<th>Prevalence Estimate, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hilton,12 1987</td>
<td>National sample</td>
<td>Men and women aged ≥18 y</td>
<td>5221</td>
<td>Hazardous drinking*</td>
<td>18 (men), 5 (women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Harmful drinking†</td>
<td>10 (men), 4 (women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Problematic drinking‡</td>
<td>7 (men), 3 (women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Abuse or dependence§</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Harmful drinking¶</td>
<td>0.3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol dependence#</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hazardous drinking§</td>
<td>14 (men), 4 (women)</td>
</tr>
<tr>
<td>Archer and Grant,13 1995</td>
<td>National Health Interview Survey</td>
<td>Men and women aged ≥18 y reporting current use of alcohol</td>
<td>22102</td>
<td>Hazardous drinking§</td>
<td>16</td>
</tr>
<tr>
<td>Grant,14 1993</td>
<td>National Health Interview Survey</td>
<td>Men and women aged ≥18 y</td>
<td>43809</td>
<td>Abuse or dependence§</td>
<td>16</td>
</tr>
<tr>
<td>Dawson et al,15 1995</td>
<td>National Longitudinal Alcohol Epidemiologic Study</td>
<td>Men and women aged ≥18 y</td>
<td>42862</td>
<td>Harmful drinking¶</td>
<td>0.3</td>
</tr>
</tbody>
</table>

*Reported consumption of 5 or more drinks per occasion at least once a week.
†Reported physical, social, occupational, or legal problems from drinking in the previous year.
‡Drinking behaviors indicative of alcohol dependence.
§Men who consume more than 14 drinks per week or women who consume more than 7 drinks per week.
¶Met the DSM-III-R criteria for alcohol abuse or dependence (see Table 1).
‖Met the ICD-III-R criteria for alcohol abuse or dependence (see Table 1).
¶†Met the ICD-10 criteria for hazardous drinking (see Table 1).
§Met the ICD-10 criteria for alcohol dependence.
Table 3. Prevalence Estimates for Alcohol Use Disorders Among Medical Outpatients

<table>
<thead>
<tr>
<th>Source, y</th>
<th>Setting</th>
<th>Study Population</th>
<th>No.</th>
<th>Type of Drinking Disorder</th>
<th>Prevalence Estimate, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>McMenamin,16 1994</td>
<td>Primary care practice in New Zealand</td>
<td>Men and women aged 30-69 y</td>
<td>611</td>
<td>Hazardous drinking*</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Abuse or dependence†</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Hazardous drinking‡</td>
<td>15 (Men), 12 (Women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol dependence§</td>
<td>9 (Men), 3 (Women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Harmful drinking¶</td>
<td>55 (Men), 25 (Women)</td>
</tr>
<tr>
<td>Adams et al,6 1996</td>
<td>22 Primary care practices in Wisconsin</td>
<td>Men and women aged ≥60 y</td>
<td>5065</td>
<td>Hazardous drinking‖</td>
<td>10 (Men), 4 (Women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol dependence‖</td>
<td>2 (Men), 1 (Women)</td>
</tr>
<tr>
<td>Piccinelli et al,10 1997</td>
<td>10 Primary care practices in Italy</td>
<td>Men and women aged 18-65 y</td>
<td>482</td>
<td>Hazardous drinking‖</td>
<td>29 (Men), 4 (Women)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol dependence‖</td>
<td>7 (Men), &lt;1 (Women)</td>
</tr>
<tr>
<td>Volk et al,17 1997</td>
<td>Primary care practice in Texas</td>
<td>Men and women with a mean age range of 39-47 y by subgroup</td>
<td>1333</td>
<td>Alcohol dependence#</td>
<td>2-9 (Range)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Alcohol dependence#</td>
<td>2-9 (Range)</td>
</tr>
</tbody>
</table>

*Men who consume more than 20 drinks per week or women who consume more than 15 drinks per week, or heavy drinking on 1 or more days per month; or positive response to “Have you felt the need to cut down on your drinking?” or “Do close relatives ever worry or complain about your drinking?”; or unexplained elevations in liver enzyme levels (a-glutamyltransferase > 50 U/L, aspartate aminotransferase or alanine aminotransferase > 40 U/L).
†Met the DSM-III-R criteria for alcohol abuse or dependence (see Table 1).
‡Men who consume more than 14 drinks per week or women who consume more than 7 drinks per week.
§CAGE questionnaire score of 2 or higher.
¶Men who consume 3 to 7 drinks almost every day or 7 or more drinks at least 3 days a week or women who consume 2 to 5 drinks almost every day or 5 or more drinks at least 3 days a week.
‖Met the ICD-10 criteria for harmful use (see Table 1).
#Met the ICD-10 criteria for alcohol dependence.
**Men who consume more than 21 drinks per week or women who consume more than 12 drinks per week or men or women who consume 5 or more drinks on a single occasion at least 4 times a month.

population-based study of more than 40,000 US adults, and found that 54% of the participants reported current consumption of alcohol. Among current drinkers, 16% met the criteria for alcohol abuse or dependence (9% of the population studied), and 24% reported drinking at hazardous levels (13% of the population studied). In the NHIS, approximately 50% of all current drinkers who were classified as having alcohol abuse or dependence also fulfilled the criteria for hazardous drinking. In a separate study of all NHIS participants (N = 41,128), Grant determined the prevalence of alcohol dependence and harmful drinking using different diagnostic criteria. In this study, prevalence rates for alcohol dependence and harmful drinking were 7% and 0.3%, respectively. Finally, Dawson et al determined that among adults surveyed in the 1992 National Longitudinal Alcohol Epileptologic Study (N = 42,862), 14% of men and 4% of women reported drinking at hazardous levels.

MEDICAL OUTPATIENT STUDIES

McMenamin screened 611 primary care patients aged 30 to 69 years for alcohol disorders using a self-administered questionnaire that measured quantity and frequency of consumption as well as alcohol-related problems (Table 3). Six percent of the subjects met the criteria for alcohol abuse or dependence and 15% were classified as hazardous drinkers. Adams et al screened more than 5000 older adults aged 60 years and above in 22 primary care practices with standard quantity-frequency questions and the CAGE questionnaire. Fifteen percent of men and 12% of women were classified as hazardous drinkers, and 9% and 3% of men and women, respectively, screened positive for dependent drinking. In this study, 14% of all hazardous drinkers also met the study criteria for alcohol dependence. Piccinelli et al determined the prevalence of hazardous, harmful, and dependent drinking among 482 primary care patients using the AUDIT and ICD-10 criteria as the criterion standard. Hazardous drinking was reported by 29% of men and 4% of women. The prevalence of harmful alcohol consumption was 7% among men and less than 1% in women, whereas fewer than 2% of subjects (all men) were alcohol dependent. Volk et al employed the AUDIT and the Alcohol Use Disorder and

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associated with hazardous and harmful drinking in primary care settings. To promote effective comparisons, future investigations should use similar diagnostic criteria and ensure that mutually exclusive prevalence estimates are reported for the entire spectrum of drinking disorders.

HEALTH-RELATED EFFECTS

Alcohol intake of more than 6 drinks per day increases the risk for numerous adverse health events. In contrast, the adverse effects of alcohol consumption in quantities above 2 (but <6) drinks per day have received less attention. Most patients drinking at hazardous or harmful levels would likely sustain this intermediate level of alcohol exposure. Accordingly, we reviewed large (N > 1000) observational cohort studies published between 1988 and 1998 that provided risk estimates for the independent effect of alcohol intake across this range of exposure on 3 outcomes: all-cause mortality, stroke, and breast cancer. Although the number and type of potential confounders examined in these studies varied considerably, age and smoking status were included in all analyses.

ALL-CAUSE MORTALITY

At least 13 large prospective studies have evaluated the relationship between alcohol consumption and all-cause mortality. In general, these studies found either a U- or J-shaped association between alcohol consumption and all-cause mortality for both sexes, where categories of exposure ranged from none to 6 drinks or more per day. Statistically significant risk estimates were reported in 6 studies, whereas 2 investigations found that alcohol exposure of 2 drinks or more a day significantly lowered overall mortality. These estimates fail to provide important information about cause-specific mortality; for example, deaths from cardiovascular disease were on average lower across these exposure categories, while mortality rates from various cancers and fatal injuries were substantially increased.

STROKE

Five recent large prospective studies examined the association between alcohol consumption and stroke. Two studies found increased risk for ischemic stroke among subjects who drank 2 drinks or more per day; however, in only 1 was statistical significance demonstrated (RR, 2.0). Of the remaining 3 studies, 1 found no effect, while found nonsignificant protective effects. Alcohol consumption of 2 drinks or more per day, however, may increase the risk for hemorrhagic stroke. Statistically significant increases in risk (RR range, 1.3-3.9) were reported by 2 studies that examined the relationship between alcohol intake and hemorrhagic stroke.

BREAST CANCER

Drinking 3 drinks or more per day may increase the risk for breast cancer, as demonstrated in 5 large prospective studies. Statistical significance was demonstrated in 2 of these investigations (RR range, 1.6-3.3), whereas in 3 studies, nonsignificant increases in risk were found. Given the public health importance of this cancer, women drinking 3 drinks or more per day should be counseled to reduce their alcohol intake, even though a causal connection has not been definitively established between alcohol consumption and breast cancer.

These data suggest that alcohol-related morbidity and mortality may occur at doses below those typically considered diagnostic of alcohol abuse and/or dependence. Alcohol consumption of 2 drinks or more per day may also increase the risk for the development of hypertension, traumatic injuries, and adverse drug-alcohol interactions, and may impair an individual’s social and occupational functioning. The absolute magnitude of this effect, however, can vary widely by outcome. Additional research is needed to define the health-related effects of hazardous and harmful drinking in primary care populations.
METHODS OF DETECTION

The Michigan Alcoholism Screening Test (MAST)50 and the CAGE questionnaire31 are 2 standardized instruments commonly used to detect drinking disorders in primary care settings. The MAST was originally developed as an instrument to detect alcohol dependence and contains 24 questions that inquire about patients’ drinking behavior and their perceptions of adverse consequences or personal concerns that stem from alcohol consumption. Studies evaluating the MAST have found it to have good performance in detecting alcohol dependence, with sensitivities that range from 90% to 98% and specificities between 57% and 82%.52,53 The MAST is not very sensitive, however, in identifying hazardous or harmful drinkers. For example, Cherpitel54 demonstrated that a brief (10-item) version of the MAST had a specificity of 98% but a sensitivity of only 31% for identifying harmful drinking as defined by the ICD-10 criteria.

The CAGE questionnaire is perhaps the best-known screening instrument for alcoholism.31 The 4 CAGE questions are: “Have you ever felt you should cut down on your drinking? Have people annoyed you by criticizing your drinking? Have you ever felt bad or guilty about your drinking? Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (eye-opener).” The National Institute of Alcohol Abuse and Alcoholism recommends using the CAGE questionnaire to screen every patient who drinks alcohol and considers 2 affirmative responses a positive indication for alcoholism.7 Using the DSM-III or DSM-III-R criteria as the criterion standard, a CAGE questionnaire score of 2 or higher has a reported sensitivity of 73% to 81% for detecting alcohol abuse or dependence, while specificity ranges from 89% to 96%.55-57

The ability of the CAGE questionnaire to detect hazardous drinking in the primary care setting has been examined. Adams et al8 administered both the CAGE and standard quantity-frequency questions to more than 5000 patients aged 60 years and above. Nine percent of men and 3% of women were determined to be positive for hazardous drinking when a cutoff score of 2 was used, whereas 20% of men and 9% of women were determined to be positive using a cutoff score of 1 or higher.8 Comparison of CAGE questionnaire responses with standard quantity-frequency responses revealed that the CAGE questionnaire had low sensitivity (14%-40%) but high specificity (96%-97%) for detecting hazardous drinkers. Changing the CAGE questionnaire cutoff score to 1 improved the sensitivity (31%-63%) at the cost of reduced specificity (89%-92%). The authors concluded that the CAGE questionnaire was not a clinically useful tool when used alone to exclude the possibility of a hazardous drinking disorder.

The MAST and CAGE questionnaire share important limitations as screening tools for the detection of hazardous and harmful drinking. First, the instruments do not provide information about the quantity, frequency, or pattern of patients’ alcohol consumption. Second, neither test discriminates between current and past drinking problems. Finally, both instruments were developed and standardized among patients with established alcohol dependence and were not intended to identify less severe disorders, such as hazardous or harmful drinking.

The recently developed AUDIT,58,59 in contrast, seeks to detect a broad spectrum of alcohol disorders that include hazardous and harmful drinking as well as alcohol dependence. The AUDIT was designed by the WHO as part of a worldwide collaborative effort to develop techniques for the identification and treatment of persons with current hazardous and harmful drinking disorders in primary care settings. The AUDIT (Table 4) consists of 10 questions and measures average quantity and frequency of consumption, the presence or absence of binge drinking, dependence symptoms, and alcohol-related problems. Each question is scored on a scale from 0 to 4, and a score of 8 or higher is typically considered a positive indication of an AUD.

The validity of the AUDIT has been determined in a variety of clinical settings.9,10,17,54-64 In the original population9 from which the AUDIT was derived (N = 1888), 36% of subjects were classified as nondrinkers (total abstinence or reported ≤3 drinking occasions per year and had never been treated for an alcohol problem), 48% were classified as drinkers (reported ≥4 drinking occasions per year and had never received treatment for a drinking problem), and 16% were categorized as alcoholic (previously diagnosed as alcoholic or had prior treatment, or were currently seeking treatment for an alcohol-related disorder). A cutoff score of 8 on the AUDIT had a sensitivity and specificity of 87% and 81% for harmful drinking and 96% and 98% for hazardous drinking, respectively.59

Piccinelli et al10 determined the properties of the AUDIT in screening primary care patients for hazardous, harmful, and alcohol dependence disorders. The AUDIT performed well, with areas under the receiver operating characteristic curve of 0.92 for hazardous drinking (95% confidence interval [CI], 0.90-0.93), 0.90 for harmful alcohol consumption (95% CI, 0.88-0.92), and 0.91 for alcohol dependence (95% CI, 0.88-0.94). Using a score of 5 or higher as a positive indicator, the test had a sensitivity of 84% and a specificity of 97% for detecting these combined drinking disorders. The positive predictive value of the test (ie, the probability that an individual with a score of 5 or higher actually has a drinking disorder) was 60% and was estimated to be as high as 81% in a population in which the prevalence of AUDs was 50%.10 Further analysis found that just 5 items of the AUDIT performed with acceptable operating characteristics. The researchers recommended that the shortened 5-item AUDIT be used to screen patients for alcohol problems. Additional data regarding the performance of the shortened instrument, however, are lacking.

Steinbauer et al62 determined the ability of the AUDIT, CAGE questionnaire, and a self-administered version of the MAST to detect alcohol abuse or dependence among 1333 ethnically diverse primary care
Table 4. The Ten-Item AUDIT* Questionnaire

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How often do you have a drink containing alcohol?</td>
<td>(0) Never, (1) 1 or 2, (2) 3 or 4 times/month, (3) 2-3 times/week, (4) 4 or more times/week</td>
</tr>
<tr>
<td>2. How many drinks do you have on a typical day when you are drinking?</td>
<td>(0) Never, (1) 1 or 2, (2) 3 or 4, (3) 5 or 6, (4) 7-9</td>
</tr>
<tr>
<td>3. How often do you have 6 or more drinks on one occasion?</td>
<td>(0) Never, (1) 1 or 2, (2) 3 or 4, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>4. How often during the last year have you found that you were not able to stop drinking once you had started?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>5. How often during the last year have you failed to do what was normally expected from you because of drinking?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>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?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>7. How often during the last year have you had a feeling of guilt or remorse after drinking?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>8. How often during the last year have you been unable to remember what happened the night before because you had been drinking?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Daily or almost daily</td>
</tr>
<tr>
<td>9. Have you or someone else been injured as a result of your drinking?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Yes, during the last year</td>
</tr>
<tr>
<td>10. Has a relative or friend or a doctor or other health worker been concerned about your drinking or suggested you cut down?</td>
<td>(0) Never, (1) 1 or 2, (2) Monthly, (3) Weekly, (4) Yes, during the last year</td>
</tr>
</tbody>
</table>

*AUDIT indicates Alcohol Use Disorders Identification Test.

patients. The AUDIT demonstrated significantly better operating characteristics across a variety of clinically pertinent subgroups (eg, women, African Americans, and Mexican Americans) compared with the CAGE questionnaire and the self-administered MAST.

Several studies61-63 have determined the validity of the AUDIT using DSM-III and DSM-III-R criteria as the reference standard. These investigations provide useful information on the ability of the AUDIT to detect alcohol abuse or dependence. Because the DSM-III and DSM-III-R criteria do not recognize hazardous or harmful drinking as distinct disorders, these investigations cannot provide data on the ability of the AUDIT to detect these less severe drinking disorders. Additional studies are needed to determine the accuracy of the AUDIT in detecting hazardous and harmful drinking disorders. Appropriate reference standards would include the ICD-10 criteria for harmful drinking and operational criteria for hazardous drinking (eg, defining an explicit quantity, frequency, or pattern of alcohol consumption). An alternative approach, as described below, is to determine the predictive validity of the instrument.

Conigrave et al64 investigated the capacity of the AUDIT to predict future alcohol-related harm. In this study, 330 participants were evaluated using the AUDIT at baseline and received follow-up at 3 years. Hazardous drinkers (AUDIT scores $\geq 8$ at baseline) were more likely to experience social problems from drinking (60% vs 10%, $P<.01$), mental disorders (73% vs 42%, $P<.01$), and acute hospitalization (RR, 1.5; $P<.05$) compared with nonhazardous drinkers over the 3-year period.64 These results suggest that hazardous drinking is predictive of subsequent alcohol-related morbidity.

Regular screening for AUDs, including hazardous and harmful drinking as well as alcohol abuse and dependence, is indicated in the primary care setting. A thorough alcohol history that includes current (and past) quantity, frequency, and pattern of alcohol consumption should be obtained for all patients. The CAGE questionnaire and MAST, despite their limitations for detecting hazardous or harmful drinking, can successfully identify many patients with alcohol abuse or dependence and can be readily administered. The AUDIT may represent the most comprehensive method for identifying patients with hazardous, harmful, abuse, or dependence disorders. Additional studies are needed, however, to demonstrate the validity and utility of this instrument in primary care settings.

The MAST, CAGE, and AUDIT questionnaires can be self-administered or administered by physicians or other health care providers. The amount of time required to administer the MAST, CAGE, and AUDIT instruments varies from 5 minutes to less than 1 minute.

Additional history is required from patients who have positive responses to quantity-frequency questions or positive results on standardized screening instruments, and from those suspected of having an alcohol disorder regardless of their test scores. Additional questions should be asked to confirm (or exclude) a diagnosis of alcohol abuse or dependence (Table 1). Establishing the presence of physical or psychological harm in the absence of alcohol abuse or dependence indicates the presence of harmful drinking. Finally, a diagnosis of hazardous
drinking is established when a patient reports a quantity or pattern of alcohol consumption that exceeds a defined threshold and when harmful consumption, abuse, and dependence disorders have been excluded.

**EFFECTIVENESS OF TREATMENT INTERVENTIONS**

Establishing a treatment plan is the next appropriate step in the management of patients with hazardous or harmful drinking disorders. Brief intervention represents the one form of treatment for hazardous or harmful drinking that has been demonstrated to be effective and thus appropriate for use in primary care settings. A brief intervention “is a short counseling session focused on helping a person change a specific behavior,” employs counseling techniques that are within the skill level of primary care physicians, and can be performed in the course of a brief office visit. These techniques have been elucidated in the FRAMES acronym: feedback about behaviors, indicating the patient’s responsibility for changing their behavior, giving patients specific advice on how behavior should be changed, giving patients a menu of options on how to change their behavior, approaching patients with empathy, and supporting patients’ self-efficacy.

Bien et al performed a meta-analysis of 32 controlled studies of brief interventions published between 1977 and 1993. These studies were conducted in a variety of settings, including generalist and specialist physicians’ offices, patient medical wards, alcohol treatment programs, and non–health care settings. Most studies (15/19) showed that brief interventions were more effective than no treatment, while the remainder demonstrated no difference.

In a more recent meta-analysis, Wilk et al examined 12 randomized controlled trials of brief interventions, 8 of which were conducted in outpatient settings. These authors selected studies that enrolled more than 30 subjects, included a control (nonintervention) group, and incorporated only brief intervention therapy. Enrolled subjects included heavy drinkers who reported drinking 21 to 35 drinks per week; however, patients with “alcohol dependence” and “alcoholism” were specifically excluded in only 6 studies. The interventions employed in these studies generally lasted from 10 to 15 minutes, and most were administered over multiple visits.

Self-reported alcohol consumption was the primary outcome measure in 9 of the 12 studies, whereas 2 studies each ascertained the number of sick days, change in liver enzyme levels, or mortality. Among the 8 studies reporting drinking outcomes that allowed calculation of a pooled odds ratio, the results demonstrated a beneficial effect (pooled odds ratio, 1.95; 95% CI, 1.66–2.30). Of the 8 outpatient-based studies, 5 showed a beneficial effect, while 2 studies each ascertained the number of binge drinking episodes during the previous 7 days (5.7–3.1 vs 5.3–4.2 binges; P < .005) and the percentage of subjects drinking excessively in the previous 7 days (47.5%–17.8% vs 48.1%–32.5%; P < .001). In addition, men in the intervention group experienced significantly fewer total hospital days than those in the control group (178 vs 314; P < .001).

Studies of treatment interventions for hazardous and harmful drinkers in primary care settings demonstrate that brief interventions may effectively decrease alcohol consumption, improve liver function (among patients with previously elevated liver enzyme levels), and decrease the use of certain health services. Brief interventions appear to be equally effective in men and women, and efficacy may be enhanced when more than 1 session is administered. Despite these encouraging results, many critical questions remain regarding the effectiveness of brief interventions. First, since most studies report outcomes for 6 to 12 months, longer-term demonstration of the impact of these interventions is needed. Second, al-

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though the interventions were generally similar across these studies, the specific content and frequency of application varied considerably. Thus, the ideal intervention that can be generally applied in a variety of settings is unknown. Third, the need for repeated booster sessions over time has not been explored. Finally, more detailed assessments of long-term outcomes, such as sustained decreases in alcohol consumption, reduction in the progression of patients to more severe alcohol disorders (eg, alcohol dependence), and the overall cost-effectiveness of these approaches, should be established. Despite these questions, the current literature supports brief intervention therapy as a useful approach for primary care providers in caring for hazardous and harmful drinkers.

**SUMMARY AND RECOMMENDATIONS**

Existing epidemiologic data indicate that less severe drinking disorders, particularly hazardous alcohol consumption, are common in primary care settings. Recent large prospective studies also suggest that alcohol consumption above 2 drinks per day may contribute to adverse health events, such as hemorrhagic stroke and breast cancer. These data support the recommendations of several national organizations that call for primary care physicians to take an active role in the identification and treatment of patients with hazardous and harmful drinking disorders. Future research is needed to further define the extent of these disorders and to identify potential subgroups at risk for hazardous and harmful drinking in primary care. Studies are also needed to more carefully define the spectrum of health-related effects associated with these disorders and to include outcomes, such as quality of life, effects on chronic medical conditions (eg, hypertension and diabetes mellitus), and the use of health services.

Routine screening for hazardous and harmful drinking is recommended for all primary care patients. Although the most effective screening method remains uncertain, physicians are advised to obtain a detailed alcohol history that includes questions on the quantity, frequency, and pattern of patients' alcohol consumption. Existing instruments such as the MAST or CAGE questionnaire, while excellent for detecting alcohol abuse or dependence, should not be used alone to screen for hazardous or harmful drinking. The AUDIT is currently the only instrument specifically designed to identify hazardous and harmful drinking. Additional studies are needed, however, to determine the ability of the AUDIT to correctly identify these disorders, particularly among diverse age, socioeconomic, and ethnic groups. Regardless of the specific method used to screen, physicians should familiarize themselves with various diagnostic criteria (Table 1) so that a diagnosis can be definitively established among patients suspected of having an alcohol disorder.

Finally, a number of well-conducted randomized trials have demonstrated the efficacy of brief interventions in the treatment of hazardous and harmful drinking in primary care settings. This treatment approach has been shown to significantly reduce alcohol consumption among treated patients. Additional research is needed, however, to demonstrate that brief interventions can decrease morbidity and mortality over longer periods (ie, >12 months) and have a favorable impact on other clinically relevant outcomes. Several excellent resources are available to assist physicians in implementing brief interventions in their practices. We recommend routine application of this treatment approach in the primary care setting, given its low cost and proven efficacy in reducing alcohol consumption and likely efficacy in improving health-related outcomes.

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