The Relationship Between Alcohol Symptoms and Consumption Among Older Drinkers

Stephen T. Chermack, Frederic C. Blow, Elizabeth M. Hill, and Sharon A. Mudd

The present study assessed the relationship between current alcohol symptoms and consumption levels in a heterogeneous sample of older adults. The sample consisted of 443 participants over age 55 who reported drinking within the past year, including social drinkers, alcoholics in treatment, and alcoholics not in treatment. Symptoms for the past year were assessed using the Diagnostic Interview Schedule (DIS-III-R) alcohol section, and subjects were subsequently assigned to two groups (symptom-free and symptomatic), depending on whether they experienced any DSM-III-R alcohol symptoms in the last year. For both men and women, average daily consumption and the frequency of heavy drinking contributed to whether participants had experienced any alcohol symptoms. The results indicate that the consumption levels of men and women differed only for symptomatic drinkers. The findings support recommendations that consumption limits for older adults should be lower than those recommended in the literature for younger adults. Furthermore, the results suggest that, in addition to limiting average daily consumption to no more than one drink per day, eliminating episodes of heavy drinking (consuming five or more drinks) could further reduce the risk of alcohol-related symptoms for older adults.
Key Words: Elderly, Problem Drinking.

THE CONSUMPTION of alcohol has been associated with increased risk of physical injury caused by automobile crashes[1] and falls.[2] Heavy alcohol use among the elderly has been associated with malnutrition, a variety of medical conditions (such as liver disease, stroke, cardiac problems, hypertension, insomnia, depression), as well as cognitive problems and dementias.[3-5] A number of studies have examined the complex relationship between aging and alcohol consumption patterns.[6-8] However, no studies have attempted to link consumption patterns of elderly drinkers to alcohol-related consequences or diagnostic criteria. Thus, despite the evidence that elderly drinkers are at risk for a variety of negative consequences associated with drinking, there has been little research on the relationship between alcohol consumption patterns and associated consequences for elderly drinkers. Such information could be

of use in formulating guidelines for safer alcohol consumption for older adults.

A few studies have linked alcohol consumption patterns to alcohol-related medical problems for younger samples of chronic heavy drinkers. According to these studies, long-term average daily consumption of 80 g (6 standard drinks) is associated with a number of medical problems,[9,10] and daily consumption of ~52 g (4 standard drinks) for men and 39 g (3 standard drinks) for women is associated with an increased risk of cirrhosis.[11] Based on such studies, guidelines for safer levels of alcohol consumption have been recommended. The Australian National Health and Medical Research Council[12] defined average daily consumption of 40 to 60 g/day (3 to 5 standard drinks) for men and 20 to 40 g/day (1.5 to 3 standard drinks) for women as hazardous, and higher levels of consumption as harmful. In support of the validity of such definitions of heavy drinking, Kranzler et al.[13] found that average daily alcohol consumption >40 g (~3 standard drinks) for men and 25 g (~2 standard drinks) for women was related to increased risk of medical and psychosocial problems in a sample of 252 drinkers between 18 and 55 years of age.

The recommended drinking limits put forth by U.S. government officials for adults below age 65 are more conservative, <26 g/day (2 standard drinks) for men and 13 g/day (1 standard drink) for women.[14,15] These limits are consistent with research that has identified patterns of alcohol consumption associated with problematic drinking in younger samples. For example, Sanchez-Craig and Israel[16] found that consumption levels exceeding 54 g (4 standard drinks) on an average of 3 days/week was related to problematic drinking in a sample of drinkers with a mean age of 34.8 years. This pattern of alcohol use would result in an average daily consumption of ~23 g/day.

Recently, modified drinking limits have been proposed for adults over the age of 65 by Dufour et al.[17] and the U.S. Department of Health and Human Services.[15] These recommendations define moderate consumption levels for healthy older adults as no more than 1 standard drink/day. This recent modification seems to be appropriate for a number of reasons. There is evidence that older adults attain higher blood alcohol concentrations than younger adults from a given dose of alcohol,[18] likely caused by changes in the percentage of body water associated with aging. Furthermore, it has been demonstrated that older adults exhibit greater alcohol-induced impairment than

younger adults at a given blood alcohol concentration.[18,19] Lastly, many older adults take medications that can have negative interactions with alcohol, such as sedatives and analgesics, or they may have medical problems that could be exacerbated by alcohol consumption. The formulation of recommended consumption limits that have been based on medical and social problems related to drinking traditionally have not addressed such age-related issues. Furthermore, there has been a lack of systemic data collection regarding the relationship between alcohol consumption and related consequences among the elderly. The current recommended drinking limits for older adults seem to be reasonable and appropriate, although they have not been based on empirical attempts to link consumption levels to alcohol symptomatology or drinking consequences.

It also should be noted that a number of studies examining the relationship between consumption patterns and alcohol problems in samples of younger adults have found that both average daily consumption and the frequency of drinking that results in acute intoxication contribute to the risk of adverse consequences.[13,20] Furthermore, a recent study by Archer et al.[21] provided evidence that drinking guidelines should address both average daily consumption and heavy drinking. Specifically, the authors estimated that if Americans followed drinking guidelines involving both average daily consumption (<2 standard drinks for men and <1 standard drink for women) and heavy drinking (never consuming 5 or more drinks), the prevalence of alcohol abuse or dependence could be reduced by 47%, compared with a reduction of 14% if only average daily consumption guidelines were followed. Thus, it is likely that guidelines for symptom-free drinking for older adult drinkers should also include specific recommendations against heavy drinking, although this has not been examined empirically.

The present study examined the relationship between two consumption measures: average daily consumption and the frequency of heavy drinking, and DSM-III-R alcohol symptoms in a heterogeneous sample of older adult drinkers. Specifically, this study assessed whether elder-specific consumption limits regarding average daily consumption (an average of 1 or less drink/day, adapted from current definitions of moderate drinking for older adults[15,17]) appropriately classified participants in this sample to symptom-free and symptomatic groups, and whether additional consumption limits regarding heavy drinking (never consuming 5 or more drinks on any drinking day) could further enhance such classification. Such information could help provide general guidelines regarding safer levels of drinking for this special population. Furthermore, given the evidence that the effects of alcohol consumption differ for males and females, this study also examined potential gender differences in the relationship between symptoms and consumption levels. It was expected that both gender and the presence of symptoms would be related to the alcohol consumption variables.

METHODS

Participants

Data for the present analysis were obtained from a large core database containing extensive interview information obtained from individuals recruited for studies at the University of Michigan Alcohol Research Center (UMARC). The UMARC primarily focuses on studying the relationship between alcohol and aging, and has devised methods to recruit participants from a wide range of sources. The core database approximates the demographic characteristics of adults aged 55 and over in southeast Michigan, with the exception of being slightly more educated than the general population. For this study, 641 individuals aged 55 and over were selected from the larger database. Age 55 was used as the lower limit for inclusion in the study to ensure that the sample consisted of older adults, and because other studies examining the relationship between alcohol consumption and drinking consequences have excluded participants 55 or over (e.g., Kranzler et al.[13]). Individuals who reported that they had not consumed any alcohol in the past year were excluded from the analyses. Thus, the final sample for the present study included 296 male and 147 female participants who reported drinking alcohol during the past year. The sample included alcohol-dependent older adults recruited from a variety of alcohol treatment facilities, alcohol-dependent older adults recruited from the community, and older adult social drinkers recruited from the community. The age of participants ranged from 55 to 91 (mean = 65.5); 91% were White, and the majority of the remaining 9% were African American. Twenty-eight percent had at least a college education, 33% had at least a high school diploma, and 39% had less than a high school diploma. Approximately 66% of participants had an annual income of less than $30,000 (median income range = $20,000 to $29,000). Fifty-seven percent of participants were living with their spouses or cohabiting, 32% reported living alone, and the remainder reported living with other relatives or friends.

Procedures

Participants completed extensive interviews as part of procedures designed to recruit volunteers for a number of different studies conducted at the UMARC. The interviews included demographics assessment, medical history, alcohol screening questionnaires (Michigan Alcohol Screening Test), a semistructured interview assessing participants' lifetime and current drinking patterns (adapted from Skinner and Sheu[22]), and the alcohol and mood disorders section of the Diagnostic Interview Schedule (DIS).[23] The analyses focused on DSM-III-R symptom status and alcohol consumption during the previous year. Symptoms for the past year were assessed using the DIS alcohol section, and measures of alcohol consumption during the past year were computed from the semistructured interview of lifetime and current drinking behavior.[22] The derived consumption measures included average daily consumption and number of days of heavy drinking (>5 drinks/day) during the past year. This definition of heavy drinking involves a lower quantity of alcohol per occasion than the definition used by Kranzler et al.[13] with a younger sample of drinkers and has been used in a number of other studies.[20,21]

Gender Differences in the Relationship Between Symptoms and Consumption. The relationships among gender, symptom severity, and alcohol consumption measures (average daily consumption, frequency of heavy drinking in the past year) was assessed with multiple analysis of variance (MANOVA) analyses. Based on the number of alcohol symptoms reported for the past year, participants were assigned to three groups: symptom-free, low symptoms, and high symptoms. The symptom-free group reported no DSM-III-R alcohol symptoms in the past year. The low- and high-symptom groups reported having 1 to 3 and 4 or more symptoms in the past year, respectively. A preliminary 3 (Group) × 2 (Gender) multiple analysis of covariance analysis using demographic variables (age, education, income, and race) and recruitment source as covariates revealed that none of these variables were significant covariates. Thus, the results reported are from a 3 (Group) × 2 (Gender) MANOVA analysis. Simple effects analyses were conducted to facilitate the interpre-

Table 1. Characteristics of the Symptom-Free, Low-Symptom, and High-Symptom Groups (In %)*

	Symptom-Free	Low symptoms	High symptoms
High school education or less	17.9	54.2	56.0
White	94.4	91.6	83.6
Income < $30,000	51.6	63.2	71.4
Male	60.2	69.5	75.0
Recruited from community	85.7	39.7	15.5
Lifetime alcohol diagnosis	17.3	87.0	100.0

* All comparisons significant at the 0.05 level.

tation of the significant interaction effect. Specifically, simple effects analyses were conducted to assess whether the effect of gender on consumption differed for the symptom-free, low-symptom, and high-symptom groups.

Relationship Between Consumption Limits and Symptoms. A hierarchical logistic regression analysis was used to examine the contribution of the two consumption variables in predicting whether participants were symptom-free or symptomatic (one or more symptoms). For this analysis, both the average daily consumption and days of heavy drinking variables were dichotomized to reflect whether participants were above or below proposed consumption limits (average daily consumption of 1 or less drinks per day; never consuming 5 or more drinks on any drinking day). This method of analysis provides information about the contribution of both consumption limits to whether participants were symptom-free and allows for the assessment of the heavy drinking limit after controlling for average consumption. Thus, the analysis can provide information about the potential utility of adding recommendations against any heavy drinking to recommendations about average daily consumption. Demographic variables were entered at stage 1. Participants' average daily consumption category was entered at stage 2, and days of heavy drinking category was entered at stage 3. To examine for potential interaction effects with gender and the two consumption limits, gender by consumption interaction terms (i.e., gender × average consumption cut-off and gender × heavy drinking cut-off) were entered into the model at stage 4.

RESULTS

Characteristics of the No-Symptom, Low-Symptom, and High-Symptom Groups

The symptom-free and symptomatic groups differed in educational attainment [χ^2(4 df) = 88.67, p < 0.01], racial composition [χ^2(2 df) = 10.14, p < 0.01], income [χ^2(22 df) = 60.60, p < 0.01], and gender composition [χ^2(1 df) = 6.93, p < 0.03]. In addition, the groups differed in whether they were recruited from treatment settings or from the community [χ^2(2 df) = 159.16, p < 0.01] and in lifetime history of alcohol diagnoses [χ^2(8 df) = 431.43, p < 0.01]. Descriptive information regarding group characteristics are presented in Table 1. The groups also differed in age [F(1,441) = 14.29, p < 0.01]. The mean age for the symptom-free, low-symptom, and high-symptom groups were 67.19, 65.51, and 62.76, respectively. According to Tukey's Honestly Significant Difference tests, the high-symptom group was significantly younger than the symptom-free and low-symptom groups.

Multivariate Analysis Examining Gender Differences

A 3 (Group) × 2 (Gender) MANOVA was conducted to examine the relationship between symptom status, gender,

and consumption measures. According to this analysis, the main effect of group was significant [F(4,870) = 61.68, p < 0.001], as was the main effect of gender [F(2,435) = 12.32, p < 0.001]. Furthermore, the interaction of group and gender was significant at the 0.001 level [F(2,870) = 5.39]. Because of the significant interaction between group and gender, the effect of gender on consumption levels was assessed separately for the symptom-free, low-symptom, and high-symptom groups. According to simple effects analyses, male and female symptom-free drinkers did not differ in consumption habits [F(2,439) = 2.16]. However, for both the low- and high-symptom groups, males had significantly higher levels of consumption than females [F(2,439) = 12.02, p < 0.001, and F(2,439) = 25.57, p < 0.001, respectively]. Descriptive statistics for each consumption measure, as well as the results of univariate simple effects analyses, are presented in Table 2.

Logistic Regression Analysis

The results of the hierarchical logistic regression analysis are displayed in Table 3. Age, education, and gender were significant predictors of whether participants were symptom-free at stage 1. At stage 2, the addition of the average daily consumption limit score significantly improved the model, and age and education remained as significant predictors. The addition of the heavy drinking limit score at stage 3 significantly improved the model. Furthermore, both consumption variables, as well as education, were significant predictors of whether participants were symptom-free at stage 3. This suggests that both consumption measures contributed significantly to predicting symptom-free status and that the days of heavy drinking variable contributed to the prediction of symptom status even after the influence of average consumption was entered into the model. Finally, the addition of the gender × consumption interaction terms at stage 4 did not significantly improve the model, and neither of the interaction terms were related to whether participants were symptomatic.

DISCUSSION

The identification of consumption levels associated with symptom-free and symptomatic drinking can help provide general guidelines for alcohol consumption for older adults. Previous studies have identified consumption levels associated with problematic drinking and problem-free drinking for younger adults with prior histories of alcohol problems.[16,24,25] However, there seems to be no previous attempts in the literature to identify alcohol consumption levels associated with symptom-free drinking with samples of older adult drinkers.

The results of the present study demonstrated that both male and female symptom-free drinkers averaged ~1 drink/day, and infrequently consumed 5 or more drinks in the previous year. The levels of average consumption are similar to recommended consumption levels for older

Table 2. Means, Standard Deviations, and Univariate Simple Effects Results

Consumption variable	Females			Males			
	n	Mean	SD	n	Mean	SD	$F(1,440)$
Symptom-free participants							
Average daily consumption	78	0.72	0.97	118	1.04	1.34	1.36
Days heavy drinking	78	1.50	6.52	118	8.00	47.51	2.67
Low-symptom participants							
Average daily consumption	40	2.09	1.91	91	4.06	3.16	16.08*
Days heavy drinking	40	51.76	93.25	91	151.09	141.86	21.94*
High-symptom participants							
Average daily consumption	29	4.73	3.07	87	6.01	2.96	50.77*
Days heavy drinking	29	186.21	124.86	87	230.70	113.69	48.71*

* $p < 0.0001$.

Table 3. Hierarchical Logistic Regression Predicting DSM-III-R Symptom Status

	Stage 1		Stage 2		Stage 3		Stage 4	
	R	Odds ratio	R	Odds ratio	R	Odds ratio	R	Odds ratio
Demographics								
Age	−0.13*	0.88*	−0.14*	0.87*	0.00	1.00	0.00	1.00
Education	−0.34*	0.72*	−0.32*	0.72*	−0.27*	0.76*	−0.32*	0.72*
Race	0.00	1.00	0.00	1.00	0.00	1.00	0.00	1.00
Gender	0.10*	1.11*	0.00	1.00	0.00	1.00	0.00	1.00
Average daily consumption cut-off score			0.37*	1.45*	0.16*	1.17*	0.03	1.03
Days of heavy drinking cut-off score					0.46*	1.58*	0.47*	1.60*
Gender × Daily Consumption							0.07	1.07
Gender × Heavy Drinking							0.02	1.02
Model improvement χ^2 df	114.74*		78.93*		115.12*		4.41	
	5		1		1		2	
Goodness-of-fit χ^2	441.39*		441.61*		433.00*		437.81*	

Note: The R statistic is used to examine the partial correlation between each independent variable and the dependent variable.
* $p < 0.01$.

adults[15] and are lower than recommended consumption levels for younger adults,[15] as well as the consumption levels of problem-free younger drinkers with prior histories of alcohol problems.[25] Furthermore, the consumption levels of the symptom-free drinkers in the present study were consistent with consumption patterns that have been shown to have potential health benefits, such as reducing the risk of coronary heart disease[26] and mortality.[27] It is important to note that the benefits of low-to-moderate consumption have been demonstrated even among elderly drinkers.[27,28]

The appropriateness of recommended average daily consumption limits for older adults (≤1 drink/day), as well as conservative recommendations regarding heavy drinking (never consuming 5 or more drinks on any drinking day), were explored. The findings indicated that drinking limits based on both consumption variables were related to whether older adults have alcohol symptoms. Furthermore, the drinking limit based on the occurrence of any episodes of heavy drinking influenced whether participants had symptoms even after controlling for the effect of the average daily consumption limit. There were no interactions between gender and proposed drinking limits in predicting whether or not participants were symptomatic. Thus, the results demonstrate that excessive or immoderate drinking was most likely related to alcohol symptoms. This is consistent with findings based on younger samples.[13] These findings suggest that recommendations focusing solely on average daily consumption would not provide sufficient guidelines for older adults to drink in a symptom-free manner. In addition to average daily consumption, recommended drinking limits should also specifically address the frequency of heavy drinking for older adults.

There is a need for additional research to refine further definitions of heavy drinking for older adults. In this study, heavy drinking was defined as days in which 5 or more drinks were consumed. Although this definition of heavy drinking has been demonstrated to be related to alcohol-related consequences in other studies, it is likely that heavy drinking in late adulthood involves lower quantities of alcohol. According to the current elder-specific recommendations regarding alcohol consumption from the U.S. Department of Health and Human Services,[15] heavy drinking for older adults seemed to be defined as days in which more than one drink are consumed. It is possible that the optimal definition for heavy drinking (in terms of discriminating between symptom-free and symptomatic drinking patterns) by elderly individuals lies somewhere between the definition used in the present study and the definition implicit in the current recommendations.[15] Future research should examine other quantities of consumption (e.g., 2, 3, 4, or 6 or more drinks/day) to refine drinking guidelines for older adults. In the mean time, the current recommendations for older adults seem to be a reasonable and safe guideline for alcohol consumption.

The present study used DSM-III-R alcohol symptoms as the measure of alcohol-related consequences. In general,

these symptoms are among the most severe alcohol-related consequences generally associated with heavy consumption. It has been argued that such criteria have been developed from studies of nonelderly men and may not be sensitive to the manner in which alcohol-related consequences are manifested in older adulthood.[29,30] Nonetheless, examination of other measures of alcohol-related consequences may find that recommendations for alcohol consumption levels for older adults should be even lower than the present study suggests. Thus, there is a need to investigate further the relationship between consumption levels and problem drinking with different types of alcohol-related consequences, such as DSM-IV symptoms and other more elder-specific measures.[31]

The issue of gender specificity in establishing drinking guidelines for elderly drinkers also requires further investigation. The recommendations put forth by the U.S. Department of Health and Human Services[15] notes that guidelines for safe alcohol consumption should be the same for elderly men and women. The present study offers support for this contention. Symptom-free drinking levels of males and females did not differ, and neither gender nor gender × consumption limit interactions were related to whether participants were symptomatic. However, consistent with studies based on younger samples,[32,33] it was also found that symptomatic females had lower levels of alcohol consumption than symptomatic males. This suggests that older adult women may experience negative effects of drinking at lower levels of consumption. The findings of this study suggest that the cut-offs for safe consumption should be the same for elderly men and women, but that women should be warned that they will develop alcohol-related symptoms at lower levels of consumption once they have exceeded the cut-offs. The relevance for gender specificity in formulating drinking limits may depend on whether clinicians or researchers need to offer guidelines for symptom-free drinking, or to identify consumption levels that maximally discriminate between symptom-free and symptomatic drinkers. Gender specificity may not be necessary for symptom-free drinking guidelines, but is likely to be necessary for identifying consumption levels that maximally discriminate symptomatic and symptom-free drinkers.

The results of this study are consistent with findings based on younger samples regarding the influence of average consumption and heavy drinking on alcohol problems[20] and gender differences in the effects of alcohol consumption (see Gomberg[33] for a review). The findings also offer some support to current elder-specific drinking guidelines.[15,17] Nevertheless, the methodology used in this study has some limitations. For example, the sample was not recruited with the intent of being representative of the general population of older adults. The percentage of individuals in the sample with a high school education or greater was relatively high for this age cohort, and it is possible that the sample had fewer medical health problems than is common in this age group. Thus, some caution should be exercised in generalizing the results to the general population of older adult drinkers. This study also relied on retrospective self-report data concerning alcohol consumption and DSM-III-R symptoms. Although the measures of alcohol consumption[22] and alcohol symptoms[23] used in this study are considered to be reliable and valid, prospective studies have the potential to specifically address issues of causality. Thus, future research should use epidemiological methods to recruit participants, and should assess the relationship between drinking and negative effects (alcohol symptoms and health problems) in a prospective manner.

The results of this study provide important information about the consumption habits of older adults who are currently drinking in a symptom-free manner. The findings provide empirical evidence regarding broad guidelines for older adult drinking. It should be noted that some older adults regularly exceed these drinking limits without experiencing alcohol symptoms. However, because of the unique characteristics of this population, some older individuals should never drink alcohol. Alcohol use can directly exacerbate a variety of chronic and acute medical and psychiatric conditions, interact with medications, or reduce medication compliance. Thus, for some individuals, abstinence would be necessary to ensure an absence of alcohol-related consequences. In appreciation of such issues, a number of authors have suggested that guidelines for alcohol consumption need to be based on an evaluation of medical and psychological health, the risk for alcoholism based on personal or family history, and should address both levels of alcohol consumption and setting of consumption.[34,35] Dufour et al.[17] also emphasized the importance of considering such factors when providing drinking guidelines specifically for older adults. Thus, it is recognized that "safe" consumption levels for particular individuals may deviate from group level data caused by a variety of individual differences factors. Nevertheless, the present study provides general information about the relationship between alcohol symptoms, gender, and consumption levels among older adults, and demonstrates the importance of addressing both average consumption and heavy drinking.

REFERENCES

1. Waller PF, Stewart JR, Hansen AR, Stutts JC, Popkin CL, Rodgman EA: The potentiating effects of alcohol on driver injury. JAMA 256:1461–1466, 1989

2. Hingson R, Howland J: Alcohol as a risk factor for injury or death resulting from accidental falls: A review of the literature. J Stud Alcohol 48:212–219, 1987

3. Atkinson RM: Alcoholism in the elderly population. Mayo Clin Proc 63:825–829, 1988

4. Finlayson RE, Hurt RD, Davis LJ, Morse RM: Alcoholism in elderly persons: A study of the psychiatric and psychosocial features of 216 patients. Mayo Clin Proc 63:761–768, 1988

5. Hurt RD, Finlayson RE, Morse RM, Davis LJ: Alcoholism ineld-erly persons: Medical aspects and prognosis of 216 inpatients. Mayo Clin Proc 63:753–760, 1988

6. Adams WL, Garry PJ, Rhyne R, Hunt WC, Goodwin JS: Alcohol intake in the healthy elderly: Changes with age in a cross-sectional and longitudinal study. J Am Geriatr Soc 38:211–216, 1990

7. Fillmore KM, Hartka E, Johnstone BM, Leino EV, Motoyoshi M, Temple MT: A meta-analysis of life course variation in drinking. Br J Addict 86:1221–1268, 1991

8. Stall R: Change and stability in quantity and frequency of alcohol use among aging males: A 19-year follow-up study. Br J Addict 81:537–544, 1986

9. Ashley MJ, Olin JS, Le Riche WH, Kornaczewski A, Schmidt W, Corey PN, Rankin JG: The physical disease characteristics of inpatient alcoholics. J Stud Alcohol 42:1–14, 1981

10. Lelbach WK: Organic pathology related to volume and pattern of alcohol use, in Gibbins RJ, Israel Y, Kalant H, Popham RE, Schmidt W, Smart RG (eds): Research Advances in Alcohol and Drug Problems: A Review of the Epidemiological Evidence, vol 1. New York, John Wiley, 1974

11. Pequignot G, Tuyns AJ, Berta JL: Ascitic cirrhosis in relation to alcohol consumption. Int J Epidemiol 7:113–120, 1978

12. National Health and Medical Research Council: Recommenda-tions Regarding Responsible Drinking Behaviour. Canberra, Australian Government Publishing Service, 1987

13. Kranzler HR, Babor TF, Lauerman RJ: Problems associated with average alcohol consumption and frequency of intoxication in a medical population. Alcohol Clin Exp Res 14:119–126, 1990

14. U.S. Department of Health and Human Services: The Physicians Guide to Helping Patients with Alcohol Problems. Washington, D.C., DHHS publication PHS 88-50215, 1988

15. U.S. Department of Health and Human Services: The Physicians Guide to Helping Patients with Alcohol Problems. Washington, D.C., DHHS publication No. 95-3769, 1995

16. Sanchez-Craig M, Israel Y: Patterns of alcohol use associated with self-identified problem drinking. Am J Public Health 75:178–180, 1985

17. Dufour MC, Archer L, Gordis E: Alcohol and the elderly. Clin Geriatr Med 8:127–141, 1992

18. Vogel-Sprott M, Barret P: Age, drinking habits and the effects of alcohol. J Stud Alcohol 45:517–521, 1984

19. Linnoila M, Erwin CW, Ramm D, Cleveland WP: Effects of age and alcohol on psychomotor performance in men. J Stud Alcohol 41:488–495, 1980

20. Anda RF, Williamson DF, Remington PL: Alcohol and fatal inju-ries among U.S. adults. JAMA 260:2529–2532, 1988

21. Archer L, Grant BF, Dawson DA: What if Americans drank less?

The potential effect on the prevalence of alcohol abuse and dependence Am J Public Health 85:61–66, 1995

22. Skinner HA, Sheu WJ: Reliability of alcohol use indices: The lifetime drinking history and the MAST. J Stud Alcohol 43:1157–1170, 1982

23. Robins LN, Helzer JE, Croughan J, Ratcliff KS: National Institute of Mental Health Diagnostic Interview Schedule: Its history, characteris-tics, and validity. Arch Gen Psychiatry 38:381–389, 1981

24. Sanchez-Craig M: How much is too much? Estimates of hazardous drinking based on clients' self-reports. Br J Addict 81:251–256, 1986

25. Sanchez-Craig M, Wilkinson DA, Phil D, Davila MA: Empirically based guidelines for moderate drinking: 1-year results from three studies with problem drinkers. Am J Public Health 85:823–828, 1995

26. Fuchs CS, Stampfer MJ, Colditz GA, Giovannucci EL, Manson JE, Kawachi MB, Hunter DJ, Hankinson SE, Hennekens CH, Rosner B, Speizer FE, Willett WC: Alcohol consumption and mortality among women. N Engl J Med 332:1245–1250, 1995

27. De Labry LO, Glynn RJ, Levenson MR, Hermos JA, LoCastro JS, Vokonas PS: Alcohol consumption and mortality in an American male population: Recovering the U-shaped curve—Findings from the norma-tive aging study. J Stud Alcohol 53:25–32, 1992

28. Scherr PA, LaCroix AZ, Wallace RB, Berkman L, Curb JD, Cor-noni-Huntley J, Evans DA, Hennekens CH: Light to moderate alcohol consumption and mortality in the elderly. J Am Geriatr Soc 40:651–657, 1992

29. Gomberg ESL: Drugs, alcohol and aging, in Kozlowski LT, Annis HM, Cappell HD, Glaser FB, Goodstadt MS, Israel Y, Kalant H, Sellers EM, Vingilis ER (eds): Recent Advances in Alcohol and Drug Problems, vol 10. New York, Plenum, pp 171–213, 1990

30. Graham K: Identifying and measuring alcohol abuse among the elderly: Serious problems with existing instrumentation. J Stud Alcohol 47:322–326, 1986

31. Blow FC, Brower KJ, Schulenbert JE, Demo-Dananberg LM, Young JP, Beresford TP: The Michigan Alcoholism Screening Test–Geriatric version: A new elderly-specific screening instrument. Alcohol Clin Exp Res 16:372, 1992

32. Jenkins R: Sex differences in alcohol consumption and its associ-ated morbidity in young civil servants. Br J Addict 81:525–535, 1986

33. Gomberg ESL: Gender issues, in Galanter M (ed): Recent Devel-opments in Alcoholism, Volume 11: Ten Years of Progress. New York, Plenum Press, 1993

34. Ashley MJ, Ferrence R, Room R, Rankin J, Schmidt W, Single E: Moderate drinking and health: Report of an international symposium. Can Med Assoc J 151:1–16, 1994

35. Pearson TA, Terry P: What to advise patients about drinking alcohol: The clinician's conundrum. JAMA 272:967–968, 1994