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# Alcohol and Health: Current Evidence

#### JULY-AUGUST 2004

### Efficacy of Brief Interventions in Primary Care to Reduce Risky and Harmful Alcohol Use

To inform the clinical guidelines of the U.S. Preventive Services Task Force (USPSTF), researchers systematically reviewed studies on the efficacy of brief behavioral counseling interventions in primary care to reduce risky and harmful alcohol consumption. Twelve controlled trials met strict criteria for inclusion.

Patients who received brief multi-contact behavioral counseling interventions (initial session up to 15 minutes and at least 1 follow-up) reduced their average weekly alcohol intake by 13%–34% more than controls in 4 trials (all of good quality) of 7. Further, 10%–19% more intervention participants than controls drank safe amounts in the 5 trials (all of good quality) that reported safe use. All effective interventions included at least 2 of 3 key elements: feedback, advice, and goal setting.

Very brief (up to 5 minutes) or brief singlecontact interventions, which were tested in 8 trials of fair to good quality, were ineffective or less effective than multi-contact interventions in reducing risky or harmful alcohol use. No significant differences were found among men and women receiving brief interventions.

*Comments*: Based on these findings, the USPSTF gave a grade B recommendation (at least fair evidence of improved health outcomes and benefits outweighing potential harms) to screening and brief counseling in primary care settings to reduce risky or harmful alcohol use among adults. Unfortunately, busy primary care physicians are more likely to perform very brief interventions that are not as effective. Better strategies to implement screening and more effective brief interventions in actual clinical practice must be developed.

Kevin Kraemer, MD, MSc

References: Whitlock EP, et al. Behavioral counseling interventions in primary care to reduce risky/harmful alcohol use by adults: a summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2004;140(7):557– 568; U.S. Preventive Services Task Force. Screening and behavioral counseling interventions in primary care to reduce alcohol misuse: recommendation statement. Ann Intern Med. 2004;140 (7):554–556.

# Alcohol, Hypertension, and Cardiovascular Disease Mortality

Heavy drinking is associated with dose-dependent increases in blood pressure. However, the relationship between drinking and mortality among patients with hypertension is unclear. To assess this relationship, researchers used self-reported data from 14,125 male participants in the Physicians' Health Study with a history of current or past treatment for hypertension and without myocardial infarction, stroke, cancer, or liver disease at baseline.

In analyses adjusted for potential confounders (e.g., age, smoking, diabetes), risk of cardiovascular disease (CVD) mortality and total mortality was significantly lower for those who drank 1–6 drinks per week (relative risk, RR, 0.6 and 0.7, respectively) and those who drank  $\geq$ 1 drinks per day (RR 0.6 and 0.7, respectively) than for those who rarely or never drank. common to observational studies of alcohol consumption and health outcomes, and also stated the limits of applying results seen in physicians to broader primary care populations. Nonetheless, in this cohort of physicians with hypertension who consumed low amounts (only 3% drank ≥2 drinks per day), moderate alcohol consumption appeared to reduce risk of CVD mortality and total mortality. Clinicians should individualize recommendations about alcohol use and help patients determine whether the cardiovascular benefits from moderate drinking outweigh any potential risks.

Joseph Conigliaro, MD, MPH

Reference: Malinski MK, et al. Alcohol consumption and cardiovascular disease mortality in hypertensive men. *Arch Intern Med.* 2004;164 (6):623–628.

Comments: The authors noted several limitations

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#### Binge Drinking's Effect on Health-Related Quality of Life

Despite its relationship with adverse social and health outcomes, heavy alcohol use is often glamorized by the media—linked to improved social interactions and enhanced quality of life. This study examined the association between binge drinking (consuming ≥5 drinks on I occasion in the past month) and health-related quality of life (HRQOL) using data from the Behavioral Risk Factor Surveillance System, a cross-sectional, random-digitdial telephone survey of adults 18 years and older nationwide.

Among current drinkers (99,783 participants who consumed  $\geq 1$  drinks in the past 30 days), 11% were frequent binge drinkers ( $\geq 3$  episodes in the past month), and 14% were infrequent binge drinkers (1–2 episodes in the past month). In analyses adjusted for possible confounding factors, frequent binge drinkers, compared with non-binge drinkers, were significantly more likely to experience  $\geq 14$  unhealthy days (physical or mental) in the past month (the variable used to determine increased physical and mental health problems). This increased risk was mainly due to having more mentally unhealthy (versus physically unhealthy) days. Infrequent binge drinking was also significantly associated with experiencing  $\geq 14$  unhealthy days among some groups (i.e., women, people 55 years and older).

*Comments:* This study determined that frequent, and sometimes infrequent, binge drinking is associated with worse HRQOL and, in particular, mental distress. Given the cross-sectional design of the study, it is not clear whether binge drinking led to worse HRQOL or vice versa. Nonetheless, the significant findings underscore the adverse consequences of binge drinking and support the need for effective prevention efforts, including educating people that heavy drinking does not improve health-related quality of life.

Joseph Conigliaro, MD, MPH

Reference: Okoro CA, et al. Binge drinking and health-related quality of life: do popular perceptions match reality? *Am J Prev Med.* 2004;26(3):230–233.

# Changes in Alcohol Consumption and Their Effects on Mortality, Cancer, and Coronary Heart Disease

Moderate drinking appears to lower risk of mortality. To examine how *changes* in intake affect risk of mortality, coronary heart disease (CHD), and cancer, investigators used data from a longitudinal study of 6644 men and 8010 women, aged 25–98 years, who had completed 2 health exams at 5-year intervals. Analyses adjusted for possible confounders (e.g., age, sex, smoking).

The risk of all-cause mortality among stable drinkers (same intake at both exams) was Ushaped, with non-drinkers (>1 drink per week) and heavy drinkers (>13 drinks per week) having the highest, and similar, mortality compared with light drinkers (1–6 drinks per week). Risk significantly increased when drinkers decreased their intake to <1 drink per week.

The risk of CHD mortality was not significantly associated with amount consumed among stable drinkers (though non-drinkers tended to have higher risk) or with increases in intake. Risk increased (borderline significance) among light drinkers who decreased their intake to <1 drink per week.

The risk of cancer was significantly higher in stable drinkers who consumed heavier amounts (>13 drinks per week). No significant changes in cancer mortality were seen among drinkers who increased or decreased their intake.

*Comments*: There are many reasons not to drink heavily—this study confirms that the increased risk of cancer is one of them. This study also found that moderate drinkers who decreased their consumption to little or no alcohol increased their risk of death from all causes. Therefore, according to these findings, adult moderate drinkers—to lower their risk of death—should not be advised to reduce their intake or to abstain.

R. Curtis Ellison, MD

Reference: Grønbaek M, et al. Changes in alcohol intake and mortality: a longitudinal population-based study. *Epidemiology*. 2004;15(2):222–228.

### Drinking Patterns— Not Just Total Amount— Affect Risk of Coronary Heart Disease and Total Mortality

Moderate alcohol consumption reduces the risk of coronary heart disease and all-cause mortality. Increasing evidence suggests that drinking patterns, regardless of average consumption, may also impact risk. Two recent studies examined this possibility.

To determine the effect of drinking patterns on the risk of myocardial infarction (MI), researchers performed a case-control study of 427 white males with incident MI and 905 healthy white male controls selected randomly from 2 Western New York counties. In analyses adjusted for multiple risk factors (e.g., age, smoking, diet, physical activity) and alcohol consumption (ounces per year), current drinkers (past 1–2 years) with the following consumption patterns had a significantly lower risk of MI than did lifetime abstainers:

- drank <1 time during the week (odds ratio, OR, 0.5) or drank daily (OR 0.4);
- drank on weekdays and weekends (compared to only on weekends) (OR 0.5); and
- drank mainly with food (OR 0.5).

In a second study, investigators analyzed questionnaire data from a population-based Danish cohort of 26,909 men and 29,626 women aged 55–65 years to learn how drinking patterns affect the risk of all-cause mortality. In analyses adjusted for multiple risk factors (e.g., age, smoking, diet, physical activity) and average alcohol intake (drinks per week), frequent drinkers ( $\geq 2$  times per week) had a lower hazard of death than non-frequent drinkers. Compared with males drinking <1 drink per week, male frequent drinkers who consumed 1–20 drinks per week had significantly lower mortality. Compared with females drinking <1 drink per week, female frequent drinkers who consumed larger amounts did not have significantly lower mortality.

*Comments*: These studies add to the accumulating evidence that drinking patterns do matter. Typically, studies of this issue should be viewed with caution because small numbers of infrequent drinkers in the high consumption categories (i.e., binge drinkers) make it difficult to adjust adequately for total alcohol intake. An editorialist calls for larger datasets, better control for confounding, and improved assessment of drinking habits to provide for more precise estimates. In the meantime, clinicians should steer moderate drinkers towards more frequent drinking of small amounts rather than less frequent drinking of larger amounts.

Peter Friedmann, MD, MPH

References: Trevisan M, et al. Drinking pattern and risk of nonfatal myocardial infarction: a population-based case-control study. Addiction. 2004;99(3):313–322; Tolstrup JS, et al. Drinking pattern and mortality in middle-aged men and women. Addiction. 2004;99(3):323–330; Poikolainen K. Best patterns of drinking for the heart (editorial). Addiction. 2004;99(3):276– 277.

#### Drinking Patterns and Rates of Alcohol-Related Problems in Three Urban Populations

Average alcohol consumption is clearly related to alcohol consequences (both positive and negative). However, studies are beginning to suggest that drinking patterns also play an important role. Researchers examined whether drinking patterns, in addition to overall consumption, contributed to differences in alcohol-related problems. They analyzed interview data from 1118 men and 1125 women randomly selected from Russian, Czech Republic, and Polish population registries.

- Russian men, compared with Czech and Polish men, were significantly more likely to report ≥2 positive responses to the CAGE alcohol screening test (35%, 19%, and 14%, respectively) and ≥2 negative consequences related to consumption (18%, 10%, and 8%, respectively). However, Russian men did not have the highest mean annual intake (5 liters versus 9 liters for Czech men and 4 liters for Polish men).
- Russian men drank less frequently on average per year than did Czech and Polish men (67 drinking sessions, 179 sessions, and 79 sessions, respectively).

- Russian men consumed much more on average per drinking session than did Czech and Polish men (mean 71 g, 45 g, and 46 g, respectively) and were more likely to drink ≥80, ≥120, or ≥160 g of alcohol on an occasion.
- Women drank less and had fewer negative consequences than did men. Further, patterns across the national samples of women did not differ significantly.

*Comments*: In this study, consuming large amounts per drinking session explained a substantial part of the differences in negative consequences among the 3 populations. These findings suggest that average consumption alone does not determine alcohol-related problems at the population level.

R. Curtis Ellison, MD

*Reference:* Bobak M, et al. Contribution of drinking patterns to differences in rates of alcohol related problems between three urban populations. *J Epidemiol Community Health.* 2004;58 (3):238–242.

#### Risky Sex: It's the Alcohol

Limiting spread of HIV infection depends partially on identifying factors that contribute to risky sexual behaviors. Researchers studied a prospective cohort of adults with HIV and current or past alcohol problems to better understand alcohol's effects on inconsistent condom use during 3 years of follow-up.

Of 345 subjects, 29% reported sexual abstinence at study entry, 33% used condoms all of the time during sex, 16% most of the time, 12% some of the time, and 10% none of the time. Alcohol consumption was significantly associated with inconsistent condom use (<100% over the last 6 months). Fifty-one percent of heavier drinkers (>14 drinks per week for men, >7 for women) and 41% of moderate drinkers, compared with 32% of abstainers, reported inconsistent condom use.

In multivariable analyses adjusted for possible confounding factors (e.g., race, education, other drug use), the following were significantly associated with inconsistent condom use (odds ratios between 2 and 4): heavier drinking in users of injection drugs; being female; identifying as gay or lesbian; living with a partner; having 2 or more sexual partners; and agreeing that condoms are a hassle to use. Recently testing HIV-positive, selling sex for drugs or money, and having a higher CD4 cell count were associated with borderline significant increases in risk.

Comments: Whether the findings in this cohort (30% employed, 67% non-white, 29% homeless) will hold true for others with HIV is unknown. However, drinking >1-2 drinks per day appears to increase risk of inconsistent condom use, particularly among users of injection drugs. When addressing this risk, clinicians, public health practitioners, and others must consider factors that contribute to inconsistent use—many of which are modifiable.

Richard Saitz, MD, MPH

Reference: Ehrenstein V, et al. Inconsistent condom use among HIV-infected patients with alcohol problems. *Drug Alcohol Depend.* 2004;73(2):159–166.

#### Lasting Effects of Alcohol on Cognitive Function in HIV Infection

The long-term effects of heavy alcohol use on cognitive function in people infected with HIV have not been well characterized. To better understand these effects, researchers studied 50 gay or bisexual men with HIV (21 who also had past alcohol abuse or dependence) and 30 without HIV (12 who had past alcohol abuse or dependence). None of the participants had current abuse or dependence.

Measures assessed various neuropsychological functions (e.g., verbal, visual, memory) and symptoms of anxiety and depression. Overall cognitive impairment did not differ significantly between those with and without HIV. However, men with past alcohol abuse or dependence, compared with those without, showed cognitive impairment on a significantly greater number of measures (impairment on a mean of 5 measures for those with past abuse/dependence and HIV; 3.8 measures for those

#### Another Complication of Drinking During Pregnancy

Fetal alcohol syndrome is a well-known consequence of drinking during pregnancy. Little is known, however, about the effects of alcohol exposure in utero on the peripheral nervous system. To examine these effects, researchers studied 30 neonates (up to 1 month old) born to women who were identified during prenatal care. Of the neonates, 17 had been exposed to >2 ounces of alcohol per day prenatally (at least until a first prenatal assessment), and 13 had not been exposed to any alcohol.

No neonates had classic signs of fetal alcohol syndrome; I had possible fetal alcohol effects. Alcohol-exposed neonates had significantly slower nerve conduction velocities and response amplitudes in some nerves. Differences were significant in the ulnar motor nerve and borderline significant in the tibial motor with past abuse/dependence without HIV; 3.5 for those without past abuse/dependence but with HIV; and 2.9 for those with neither past abuse/dependence nor HIV).

*Comments*: This study's strength is its detailed assessments of participants. However, given the small sample size, researchers could not adjust for factors that might explain the association between past alcohol use disorders and cognitive impairment. Nonetheless, the findings suggest that the association between alcohol abuse or dependence and cognitive dysfunction in HIV-infected men is particularly pronounced.

Richard Saitz, MD, MPH

Reference: Green JE, et al. The effect of previous alcohol abuse on cognitive function in HIV infection. *Am J Psychiatry*. 2004;161 (2)249–254.

nerve. No significant differences were found in peroneal, median, or sensory nerve conduction.

*Comments*: This small study could not determine the length and intensity at which alcohol exposure causes harm, nor could it inform us of the clinical implications of its findings. Nonetheless, despite its sample size, the study did demonstrate yet another complication—peripheral nerve conduction abnormalities—of alcohol consumption during pregnancy. The best advice to pregnant women or to those planning pregnancy is abstinence. Richard Saitz, MD, MPH

*Reference:* Avaria MD, et al. Peripheral nerve conduction abnormalities in children exposed to alcohol in utero. *J Pediatr.* 2004;144(3):338–343.

### WHO Report Summarizes Biological Factors Related to Substance Use

The World Health Organization (WHO) recently published *Neuroscience of Psychoactive Substance Use and Dependence*, a comprehensive report summarizing 30 years of research on biological factors related to substance use. Some of its key conclusions and recommendations include the following:

- "...Substance dependence is a chronic, relapsing disorder with a biological and genetic basis, and is not simply due to lack of will or desire to quit" (p. 7).
- Tobacco, alcohol, and illicit drugs are responsible for 9%, 3%, and 0.4% of deaths worldwide, respectively. Tobacco and alcohol are among the top 10 leading risk factors of avoidable disease burden, with each responsible for approximately 4% of disability worldwide.
- Effective treatments for substance dependence, including pharmacological and behavioral interventions, are available and can be integrated into health systems, including primary care.
- The stigma associated with substance use is strong, pervasive, and prevents people from seeking treatment; a WHO study

### Alcohol Consumption and Diabetes Mellitus

A number of recent studies have addressed questions regarding alcohol consumption and the risk and control of diabetes. Researchers conducted a systematic review and summarized the findings of 32 such studies (27 involved type 2 diabetes only).

- Moderate drinking (defined variably in each study), compared with not drinking, reduced diabetes risk in 11 of 18 studies (2 with borderline significant findings, 1 with significant findings only in people with a normal body mass index).
- Drinking (defined variably: ≥1.4 drinks per day, >5.5 drinks per day, any current drinking in people with a low body mass index, ≥2-3 times per week of unspecified amounts) significantly increased risk of diabetes in 4 of 18 studies.
- Consumption (about 1–6 drinks on an occasion under experimental conditions) did not impair, and sometimes improved, glycemic control in the 6 small studies that examined it.
- In patients with diabetes, moderate drinking, compared with not drinking, significantly decreased risk of death from coronary heart disease (CHD) (by up to 79% in 3 of 4 studies) and CHD-related events (by up to 55% in 2 of 3 studies).

showed that substance addiction, out of 18 different disabilities, ranked highest or nearly highest in terms of social disapproval or stigma in 14 countries. Neuroscience-based knowledge of substance dependence can reduce this stigma.

• Substance dependence often co-occurs with other mental conditions. Proper treatment of either substance dependence or mental illness requires attention to this comorbidity.

*Comments:* This report summarizes what researchers have known for some time—there is a scientific basis for the etiology and management of alcohol, tobacco, and other drug use disorders. Its findings may help dispel long-standing myths about the addictions.

Richard Saitz, MD, MPH; Rosanne Guerriero, MPH

Reference: World Health Organization. Neuroscience of psychoactive substance use and dependence: summary. Geneva, Switzerland: World Health Organization; 2004.

- Consuming about 3 drinks on an occasion with troglitazone or a sulfonylurea, assessed in 2 small studies, did not affect glycemic control.
- Heavy use (defined variably) significantly increased diabetic retinopathy in 1 study and had no effect in another.

*Comments*: Moderate alcohol use may decrease risk of type 2 diabetes and diabetes-related cardiovascular events. However, results from this review are inconsistent, and some included studies suggest increased risk at drinking levels often considered to be moderate. Given current evidence, it is likely safe for people with type 2 diabetes to follow usual drinking recommendations ( $\leq I$  drink per day for women and people over 65 years;  $\leq 2$  drinks per day for men 65 years and younger). Further study is needed to determine the effect of alcohol use and alcohol problems on long-term glycemic control and self-care.

Kevin L. Kraemer, MD, MSc

Reference: Howard AA, et al. Effect of alcohol consumption on diabetes mellitus. Ann Intern Med. 2004;140(3):211–219.

#### Does Experience Influence Hospital's Resource Use in Treating Alcohol and Other Drug Diagnoses?

Previous studies suggest that hospitals with greater experience provide more efficient and effective cardiac, cancer, and surgical care. To investigate whether a hospital's experience with alcohol and other drug diagnoses or its teaching status impacts resource use, researchers analyzed national data from the 1996 Healthcare Costs and Utilization Project and other large administrative databases.

In analyses adjusted for multiple hospital (e.g., number of beds, ownership, case mix index) and patient (e.g., age, sex, race, secondary diagnoses) characteristics, relative experience (proportion of alcohol- and drug-related admissions to total admissions) was significantly associated with *lower charges* but also associated (borderline significance) with greater length of stay. Teaching hospital status was not significantly associated with either charges or length of stay. *Comments*: The authors speculated that the lower charges and longer lengths of stay in high volume hospitals might have resulted from managing patients with substance-related disorders in less expensive settings (e.g., wards rather than ICUs). They did not address quality of care, readmissions, or other outcomes. Thus, whether this less expensive care leads to better or worse clinical outcomes remains unknown.

Peter Friedmann, MD, MPH

Reference: Bramble JD, et al. Resource use in treating alcoholand drug-related diagnoses. Does teaching status and experience matter? J Gen Intern Med. 2004;19(1):36–42.

## Alcohol and Other Drug Use Initiation in American Indian Adolescents

Generally, risk of alcohol and tobacco use begins during adolescence, and users of these substances are more likely to progress (up until young adulthood) to marijuana and then other illicit drugs. To examine these risks among American Indian adolescents, investigators studied semiannual survey data collected over 3 years from 14–20 year olds at 7 predominantly American Indian high schools.

Of 568 adolescents who were abstinent at the start of the study, 42% initiated use with alcohol, marijuana, and/or inhalants, while 7% initiated use with other illicit drugs (e.g., cocaine). Initiation of substance use peaked at approximately age 18, and alcohol was the most common first substance used.

Of 1244 adolescents who used alcohol, marijuana, and/or inhalants at the start of the study, 24% progressed to other illicit drug use. Adolescents who had initiated substance use with marijuana or inhalants (versus alcohol) were significantly more likely to progress to other illicit drug use. Risk of initiation and progression significantly

# Alcohol Screening and Referral on College Campuses

Binge drinking is common on college campuses. Since few population-based strategies have successfully curbed binge drinking, approaches that target problem drinkers specifically, such as standardized routine screening in healthcare settings and referral of those in need, are gaining wider appeal. To assess alcohol screening and referrals on college campuses, researchers surveyed a state-stratified, random sample of 4-year colleges/universities with health centers (76% response rate; 234 schools included in the analysis).

- Thirty-three percent of the schools conducted routine alcohol screening of most or all (96%) students visiting their health centers. Schools that did not routinely screen reported screening only 10% of visitors.
- Urban, large, and especially public schools were significantly more likely to routinely screen than others.
- Screening was typically part of a standard medical history and physical. Twelve percent of schools used a standardized instrument (most often the CAGE) to screen.

differed by tribal group and season.

Comments: All American Indian adolescents, like other adolescents, will not necessarily follow the specified patterns of substance use initiation and progression. The findings of this study, however, do suggest that almost half of American Indian adolescents initiate substance use with alcohol, marijuana, and/or inhalants, and a guarter of users progress to other illicit drugs. This study did not address the role of tobacco in substance use progression (i.e., because it could not distinguish between ceremonial and non-ceremonial use). But, its results do imply that efforts to prevent initiation and progression may need to be tailored to the specific issues facing individual communities.

Richard Saitz, MD, MPH

Reference: Novins DK, et al. American Indian substance use: the hazards for substance use initiation and progression for adolescents aged 14 to 20 years. J Am Acad Child Adolesc Psychiatry. 2004;43(3):316– 324.

• On average, health centers offered 3 referral options, the most common being the campus counseling center, followed by substance abuse treatment in the community, 12-step programs, and individual therapy.

*Comments*: The findings of this nationally representative study highlight both the lack of alcohol screening in college health centers as well as potential inadequacies in practices used by those who do screen (e.g., lack of standardized instruments, referral options that may be inappropriate for college-aged students). Given the harm caused by—and few successful strategies to curb—heavy drinking, college health centers should receive the necessary support (e.g., funding, training) to implement effective screening and referral, including appropriate follow-up to ensure students use and benefit from referral services.

Rosanne Guerriero, MPH

Reference: Foote J, et al. A national survey of alcohol screening and referral in college health centers. *J Am Coll Health*. 2004;52 (4):149–157.

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# **Contact Information:**

Alcohol and Health: Current Evidence Boston University School of Medicine/ Boston Medical Center 91 East Concord Street, Suite 200 Boston, MA 02118 ahce@bu.edu

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