

Alcohol Is Not a Dichotomous Variable

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Smoking is a dichotomous variable. Controlled clinical trials of smoking cessation have included anyone who smoked one cigarette a day,^{1,2} or even one puff in the past week.³ Although there are some subtleties, especially assessing the degree of nicotine dependence, a simple question suffices in screening for tobacco use: "Do you use tobacco?"

Alcohol use is often tacitly considered a dichotomous variable: the patient is either an "alcoholic" or not. At a more refined level, clinicians can follow the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV)*,⁴ using in effect a three-level ordinal variable, ie, alcohol dependence, alcohol abuse, or neither.

Alcohol is not, however, a dichotomous variable, and some patients who have alcohol-related problems, or who are at risk for developing them, do not meet criteria for an alcohol-use disorder. Diagnostic criteria for alcohol-use disorders under DSM-IV and other classification schemes do not include measures of the quantity or frequency of alcohol use. All the criteria are consequences of drinking, either biological, eg, withdrawal, or psychological, eg, persistent desire to reduce drinking, or social, eg, employment difficulties. Most screening tests for alcohol-related problems, such as the CAGE questions⁵ or the Michigan Alcoholism Screening Test (MAST),⁶ focus on consequences. Because these tests are screening for diagnosable disorders, they ask nothing about the quantity and frequency of drinking.

The simplicity of a dichotomous variable, however, belies complexity. Alcohol consumption without any consequences (yet) can be hazardous. The threshold of risk is not well defined, but may be relatively low. A drink a day increases a woman's risk of breast cancer by about 11%,⁷ and although only 10% to 35% of severely alcohol-dependent patients devel-

op hepatic cirrhosis,⁸ one to two drinks a day increases risk of cirrhosis about eightfold.⁹ On the other side of the risk-benefit equation, a drink every other day reduces the risk of myocardial infarction by about 12%, with little further reduction in risk at heavier levels of drinking.¹⁰ Based on the health effects of what many would consider "light" drinking,¹¹ the National Institute on Alcohol Abuse and Alcoholism¹² advises that men limit consumption to not more than 4 drinks per occasion and 14 per week, and women, 3 drinks per occasion and 7 per week.

Given the complex relationships between drinking and health, what should we screen for? If one accepts the implications of the appropriately named "preventive paradox,"^{13,14} we should screen for at-risk drinkers, that is, those drinking more than safe limits but whose problems are less severe and who are not alcohol dependent. Although a "heavy" drinker is more likely to have alcohol-related problems than a "light" drinker is, the latter are much more numerous. Therefore, a part of society's burden of alcohol-related problems is caused by "light" drinkers. That part may be substantial. More alcohol-related injuries occur among "moderate" drinkers than among "heavy" drinkers, for example.¹⁵ An Institute of Medicine report put it quite directly¹⁶: "If the alcohol problems experienced by the population are to be reduced significantly . . . a principal focus of intervention should be on persons with mild or moderate alcohol problems."

Furthermore, it is important to remember that the effectiveness of brief physician-based interventions has been shown primarily in groups of at-risk drinkers, many of whom did not meet criteria for alcohol dependence.¹⁷ In the British Medical Research Council's randomized clinical trial,¹⁸ only 53% of all participants answered positively to two or more of the CAGE questions even though all were drinking above safe limits. And the World Health Organization's clinical trial of brief intervention sought to exclude alcohol-dependent persons from the study with exclusion criteria such as prior treatment for alcoholism, prior medical advice to stop drinking, or morning drinking.¹⁹ Screening for at-risk drinking has a reasonably solid scientific basis.

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The preventive paradox makes sense from a public health perspective, and part of our efforts as clinicians should be focused on primary and secondary prevention, including early intervention with at-risk drinkers. We are also concerned, however, about patients with alcohol and other drug dependence. Given the effectiveness of treatment for these disorders,²⁰ including effective pharmacotherapy,²¹⁻²³ we should screen for them as well.

A basic problem remains, however. Even though screening for alcohol-related problems is strongly recommended by the US Preventive Services Task Force²⁴ and others, most of us do not do it.²⁵ In the 1991 National Health Interview Survey, only 39% of respondents reported being asked by their physician about their alcohol use during their last "routine checkup." Even fewer, 23%, reported being asked about illicit drug use.²⁶ Moreover, resident physicians counseled only one half of their patients who had an alcohol problem even though the physicians were presented with the results not of a screening test but of a DSM-based diagnostic interview.²⁷ Screening instruments are available to detect both at-risk drinking and alcohol dependence, notably the Alcohol Use Disorders Identification Test (AUDIT), a 10-item self-administered questionnaire designed to detect either alcohol dependence or heavy drinking in primary care patients.^{28,29} Ten items, however, may seem to foist the physician's agenda onto the patient³⁰ and may appear to be too focused on one issue that, though important, is only one of about 25 issues the US Preventive Services Task Force recommends we deal with in every adult patient.

At this point, the work by Brown et al³¹ in this issue of the *Journal* provides a tentative answer. Asking just two questions, they were able to identify over 80% of patients with a current substance-use disorder, not only those with an alcohol problem but also those with problems with other drugs, licit or illicit. As Brown et al acknowledge, the two items were chosen from a group of nine questions that were presented together. Therefore, the sensitivity and specificity figures may be inflated by the effects of chance. Cyr and Wartman's two-item screening test for alcohol problems had a sensitivity of 91.5% in their study,³² but only 53% when tested in a second study.³³ Likewise, this new two-item screening tool needs further testing to assure us of its reliability as well as its generalizability across clinical settings. Furthermore, the order or the context in which the

questions were asked may have some effect on their utility in screening. In a group of medical and surgical inpatients who tested positive for alcoholism on the MAST, Steinweg and Worth³⁴ found that prefacing the CAGE questions with closed-ended questions about the quantity and frequency of drinking reduced the sensitivity of the test from 95% to 32%.

On the other hand, the new two-item screening test proposed by Brown et al may perform even better than they have stated. Some of the false-positive responses may have come from patients who did not meet criteria for a diagnosis of abuse or dependence but who may have been heavy, at-risk drinkers. These are the patients who might actually benefit most from our intervention efforts. And, one could argue, false-negative responses may have been from patients who had a diagnosable condition but who were not yet ready to address it. The two questions are simple enough to be incorporated into most visits, not just on health maintenance visits, and therefore could be used often enough to catch those persons at a later visit, perhaps when they were more open to considering the issue.

While it is too early to dogmatically prefer one screening method over the others, we have available to us many clinically useful tools. Brown and his colleagues have provided us with another that, if validated in further work, may not only save us time but also help us screen for problems with other drugs. Time, or the lack of it, is a barrier to screening for and intervening with patients who have alcohol and drug use disorders.^{25,30} On the other hand, most of us (90.6%) spend an inordinate amount of time in the "annual checkup" doing unproductive physical examination maneuvers,³⁵ time that could be spent screening for problems such as substance use disorders. Other barriers remain that need to be addressed so that we can continue to improve our care for patients with these sometime frustrating problems.

As we await the development and refinement of screening and intervention techniques, we should keep in mind that alcohol causes 100,000 deaths annually in the United States.³⁶ It is time for us to apply what we already know: screening is effective, and brief interventions and more extensive treatment work.

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