

# Electronic Alcohol Screening and Brief Interventions Expectations and Reality

Timothy S. Naimi, MD, MPH; Thomas B. Cole, MD, MPH

**Alcohol use is common** in adolescence and young adulthood and is associated with adverse health outcomes such as physical and sexual assault, motor vehicle crashes, unin-



Related article page 1218

tended pregnancy, and sexually transmitted diseases.<sup>1</sup> The US Preventive Services Task Force recommends alcohol screening and brief counseling interventions as a component of routine adult preventive services, although it has not found sufficient evidence to recommend for or against it for adolescents.<sup>2</sup> However, the implementation of traditional interpersonal screening and brief counseling interventions in primary care clinical settings has been limited due to a variety of factors including the time and effort related to staff training, difficulty with integration into practice flow, and time constraints placed on clinicians and practices relative to reimbursement rates.<sup>3</sup>

Electronic alcohol screening and brief counseling interventions could alleviate many of these barriers, and for this reason it has generated considerable enthusiasm. In theory, it could reduce the need for training, provide uniform and presumably high-quality protocols, reach large numbers of persons, and do so in a cost-efficient manner. Furthermore, since it can be offered outside of clinical settings, it can reach young adults who may drink excessively but are unlikely to have routine preventive health visits, including those in universities and the military.

However, electronic alcohol screening and brief counseling intervention lacks interpersonal contact and often takes place outside of structured clinical environments, so rates of participation tend to be low. Furthermore, excessive drinkers may be less likely than individuals with other risky behaviors (eg, smoking) to perceive a problem, and are not typically interested in reducing their drinking, at least initially. This may affect their engagement with electronic alcohol screening and brief counseling interventions and may limit its effectiveness even once they are engaged.

Studies of electronic alcohol screening and brief counseling interventions are heterogeneous and of varying quality, which may explain why most but not all reviews have suggested possible benefits of its use.<sup>4-7</sup> A limitation of behavioral counseling interventions (electronic or otherwise) that could nullify small-to-moderate effect sizes of self-reported outcomes is that once a participant has developed a desire to change drinking behavior, that individual may overestimate or overreport reductions in drinking compared with control participants.<sup>8,9</sup> Because of this desire, participants may also be more likely to drop out of these programs or trials if they are disappointed in themselves or em-

barrassed because of not having reduced their drinking or because their drinking has increased. Finding similar overall rates of attrition between intervention and control groups does not obviate this concern. Unfortunately, there are few corroborating data about alcohol-related outcomes among participants in electronic alcohol screening and brief counseling interventions that are not based on self-report.

In this issue of *JAMA*, Kypri et al<sup>10</sup> report the results of a trial of electronic alcohol screening and brief counseling interventions implemented in 7 of New Zealand's 8 universities. Of 14 991 non-Maori students aged 17 to 24 years who were contacted by e-mail as many as 3 times and offered the opportunity to win supermarket vouchers or an iPad, 5135 (34%) students completed the Alcohol Use Disorders Identification Test-Consumption (AUDIT-C) screening.<sup>11</sup> The 3422 respondents who screened positive (scored  $\geq 4$ ) were randomly assigned to the control group (screening only) or to the intervention group (electronic alcohol screening and brief counseling interventions), which provided a brief (10-minute) self-assessment with personalized feedback on how to reduce their alcohol-related health risks, an estimated blood alcohol concentration for their heaviest recent drinking episode with information on the sequelae of intoxication and the risk of having a single vehicle traffic crash, bar graphs comparing respondents' consumption with that of others, and hyperlinks for accessing help with drinking problems.

At 5-month follow-up, 84% of the intervention group and 83% of the control group responded to a set of validated questions about their drinking frequency, consumption per typical drinking occasion, volume of alcohol consumed, and academic problems. Of the 6 primary outcomes, there was a benefit in only 1, and that benefit was small—relative to control participants, those receiving the electronic alcohol screening and brief counseling interventions consumed 1 less drink (4 vs 5) per typical drinking occasion, a relative risk reduction of 7%. However, the results of a preplanned sensitivity analysis found that some or all of the observed difference could be explained by differential attrition on the basis of possible increased consumption among those in the intervention group who did not complete follow-up.

A major strength of the study is the participation of students from 7 of New Zealand's 8 universities, which is as near to a real-world evaluation in a population of university students as is likely to be achieved. This study demonstrates that high-quality electronic alcohol screening and brief counseling intervention programs can be implemented within national populations with relatively high rates of follow-up among those who

engage in the program. However, the high quality of the electronic alcohol screening and brief counseling interventions protocol, its implementation and subsequent rigorous per-protocol analyses, coupled with its primarily negative findings, leads to questions about the effectiveness of these programs generally and among university students in particular. Although electronic alcohol screening and brief counseling interventions may have effects on participants among subgroups of university students or among other groups, the results of this and other well-conducted studies suggest that the effect of this type of intervention among university students is modest at best.<sup>7,12-14</sup>

Because electronic alcohol screening and brief counseling interventions can be implemented on a wide scale at modest cost, it could be viewed as a potential public health intervention. However, extrapolating participant effects of these programs to estimate population-level effects is problematic because screening rates are likely to be higher in research trials, and those who participate in such trials and screen positive may not be representative of larger populations, either in terms of their alcohol consumption characteristics (eg, the prevalence of severe alcohol use disorder in which brief counseling has not proven effective) or in terms of their response to an intervention that is predicated on openness to behavioral change.<sup>15</sup>

At present, there is little direct evidence that electronic alcohol screening and brief counseling intervention has a population-level effect on excessive alcohol consumption or re-

lated harms in any group, and therefore its utility as a stand-alone public health approach is in doubt.<sup>15</sup> As a scientific standard, future studies evaluating possible population-level health effects of this intervention (which, to be clear, was not the purpose of the study by Kypri et al<sup>10</sup>), should assess outcomes at the population level, ideally using instruments external to the study. In addition, corroborating evidence from outcomes other than those based on self-report would be essential to establish effectiveness.

To reduce drinking among university students, proven interventions are generally similar to those shown to reduce excessive drinking among adults and youth in the general population and include “environmental” alcohol policy interventions such as those to increase the price of alcohol and decrease its physical availability either generally or within specific times, locations, or social contexts.<sup>16,17</sup> However, more than a decade after the National Institute of Alcohol Abuse and Alcoholism released recommendations for environmental strategies to reduce binge drinking among university students in the United States,<sup>18</sup> there has been little progress in adoption of those strategies.<sup>19</sup> For improving population health, including within university communities, electronic alcohol screening and brief counseling intervention may be acceptable to industry<sup>20</sup> and easy to implement, but does not appear to be the easy way out of alcohol-related problems that many, rightfully and reasonably, have wished for.

#### ARTICLE INFORMATION

**Author Affiliations:** Clinical Addiction Research and Education Unit, Section of General Internal Medicine, Boston Medical Center, Boston, Massachusetts (Naimi); *JAMA*, Chicago, Illinois (Cole).

**Corresponding Author:** Timothy S. Naimi, MD, MPH, Clinical Addiction Research and Education Unit, Section of General Internal Medicine, Boston Medical Center, One Boston Medical Center Pl, Boston, MA 02118 (tim.naimi@bmc.org).

**Conflict of Interest Disclosures:** Both authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

**Additional Contributions:** We would like to acknowledge Jason Blanchette, MPH, and Richard Saitz, MD, MPH, Boston Medical Center, for their contributions to the preparation of this article. Neither individual was compensated in association with their contribution.

#### REFERENCES

1. Rehm J, Mathers C, Popova S, et al. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*. 2009;373(9682):2223-2233.
2. US Preventive Services Task Force. Screening and behavioral counseling interventions in primary care to reduce alcohol misuse. <http://www.uspreventiveservicestaskforce.org/uspstf/uspstfdrin.htm>. Accessed March 7, 2014.
3. McKnight-Eily LR, Liu Y, Brewer RD, et al. Vital signs: communication between health professionals and their patients about alcohol use—44 states and the District of Columbia, 2011. *MMWR Morb Mortal Wkly Rep*. 2014;63(1):16-22.
4. Centers for Disease Control and Prevention. Preventing excessive alcohol consumption: electronic screening and brief intervention (e-SBI). <http://www.thecommunityguide.org/alcohol/esbi.html>. Accessed February 27, 2014.
5. Rooke S, Thorsteinsson E, Karpin A, et al. Computer-delivered interventions for alcohol and tobacco use: a meta-analysis. *Addiction*. 2010;105(8):1381-1390.
6. Bewick BM, Trusler K, Barkham M, et al. The effectiveness of web-based interventions designed to decrease alcohol consumption. *Prev Med*. 2008;47(1):17-26.
7. Elliott JC, Carey KB, Bolles JR. Computer-based interventions for college drinking: a qualitative review. *Addict Behav*. 2008;33(8):994-1005.
8. McCambridge J, Kypri K, Elbourne D. In randomization we trust? there are overlooked problems in experimenting with people in behavioral intervention trials. *J Clin Epidemiol*. 2014;67(3):247-253.
9. Murray E, White IR, Varagunam M, et al. Attrition revisited: adherence and retention in a web-based alcohol trial. *J Med Internet Res*. 2013;15(8):e162.
10. Kypri K, Vater T, Bowe SJ, et al. Web-based alcohol screening and brief intervention for university students: a randomized trial. *JAMA*. doi:10.1001/jama.2014.2138
11. Bradley KA, DeBenedetti AF, Volk RJ, et al. AUDIT-C as a brief screen for alcohol misuse in primary care. *Alcohol Clin Exp Res*. 2007;31(7):1208-1217.
12. McCambridge J, Bendtsen M, Karlsson N, et al. Alcohol assessment and feedback by email for university students. *Br J Psychiatry*. 2013;203(5):334-340.
13. Kypri K, McCambridge J, Vater T, et al. Web-based alcohol intervention for Māori university students. *Addiction*. 2013;108(2):331-338.
14. Kypri K, Hallett J, Howat P, et al. Randomized controlled trial of proactive web-based alcohol screening and brief intervention for university students. *Arch Intern Med*. 2009;169(16):1508-1514.
15. Heather N. Can screening and brief intervention lead to population-level reductions in alcohol-related harm? *Addict Sci Clin Pract*. 2012;7(1):15.
16. Babor T, Caetano R, Casswell S, et al, eds. *Alcohol: No Ordinary Commodity: Research and Public Policy*. 2nd ed. New York, NY: Oxford University Press; 2010.
17. Bonnie RJ, O'Connell ME, eds; National Research Council, Institute of Medicine. *Reducing Underage Drinking: A Collective Responsibility*. Washington, DC: National Academies Press; 2004.
18. National Institute on Alcohol Abuse and Alcoholism. *A Call to Action: Changing the Culture of Drinking at US Colleges*. Bethesda, MD: National Institute on Alcohol Abuse and Alcoholism; 2002.
19. Nelson TF, Toomey TL, Lenk KM, et al. Implementation of NIAAA College Drinking Task Force recommendations. *Alcohol Clin Exp Res*. 2010;34(10):1687-1693.
20. Diageo. Sustainability and responsibility report 2012: screening and brief intervention programmes scale up in the United States. <http://srreport2012.diageoreports.com/top-stories/screening-and-brief-intervention-programmes-scale-up-in-the-united-states.aspx>. Accessed March 7, 2014.