

# Feasibility of Using an Alcohol-Screening and Health Education System With Older Primary Care Patients

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**Background:** This study evaluated the feasibility of a combined alcohol-screening and health education system for elderly patients

**Methods:** The Computerized Alcohol-Related Problems Survey (CARPS) was evaluated in primary care practices among 106 current drinkers, 60 years and older. The CARPS contains (1) a self-administered screening survey; (2) software to scan or hand-enter survey responses; (3) software to process data and electronically generate reports of patients' drinking risks; (4) health education; and (5) a database useful for clinical and quality improvement purposes.

**Results:** Nearly all study participants were able to complete the CARPS while waiting for a prescheduled appointment with their physician. There were 44% of patients who were hazardous and 9% who were harmful drinkers. About 20% of men and 26% of women were binge drinkers. Most (85%) patients agreed that alcohol is an important topic, 67% reported learning new information, 78% had never discussed drinking with a physician, and 31% intended to do so. After reviewing CARPS data, physicians concluded that alcohol use in the elderly is an important quality improvement topic.

**Conclusions:** Combined screening and health education systems appear feasible for use in practice if they deal with pertinent health problems such as alcohol use. Their data can encourage discussions between physicians and patients and might be used for quality improvement activities. (J Am Board Fam Pract 2001;14:7-15.)

Alcohol-related problems in the elderly are an important public health concern.<sup>1,2</sup> Population-based studies, using various methods and diverse settings, estimate the prevalence of current alcohol-related problems in older Americans to range from 2% to 22%, with between 4% and 10% of older Americans actively alcoholic.<sup>3-5</sup> A 1989 study of Medicare claims data found the rate of alcohol-related hospitalizations among persons 65 years of age and older to be similar to that for myocardial infarction.<sup>6</sup> As the elderly population grows, the absolute number of older adults with alcohol-related problems will also rise, contributing to the magnitude of this public health issue.

Older adults can experience adverse health effects even at relatively low levels of consumption

because of age-related physiologic changes and the interaction between alcohol, declining health, medication use, and diminishing functional status.<sup>7</sup> Aging is associated with decreases in body water volume and lean body mass; thus, older people reach higher peak alcohol levels at lower levels of use.<sup>8,9</sup> Relatively low consumption levels can adversely affect chronic medical problems common in older persons, such as hypertension<sup>10</sup> and diabetes,<sup>11</sup> and can increase the difficulty of managing them. More than 75% of older adults regularly use medications<sup>12</sup> (such as nonsteroidal anti-inflammatory, antihypertensive, and antidepressant agents), many of which have the potential to interact adversely with alcohol.<sup>13,14</sup>

Despite the prevalence of problematic alcohol use in the elderly, primary care physicians do not often screen their patients for alcohol-related risks or problems.<sup>15</sup> Among the major reasons for not doing so is that most of the available screening measures have been designed to detect abusive and dependent drinking or alcoholism. They are probably less applicable to the general needs of the community-dwelling elderly, whose risks occur primarily at relatively low consumption levels, al-

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though some older adults are known for episodic heavy drinking<sup>16,17</sup> For instance, the CAGE questionnaire, one commonly used screening measure, can successfully determine which older adults are suffering from alcohol abuse or dependence,<sup>5,18</sup> but it does not provide data on the relation between alcohol and health, medication use, and functional status. The CAGE also performs poorly in detecting heavy or binge drinkers.<sup>19,20</sup> The Alcohol Use Disorders Identification Test (AUDIT) is another commonly used screening measure, which has been shown to detect hazardous and harmful drinking in younger people,<sup>16</sup> but it is not designed to provide information on alcohol use and health or on non-hazardous drinking. Information on nonhazardous drinking can be clinically important in light of recent studies showing that in some persons, light consumption (ie, one or two drinks daily) has beneficial effects on cardiovascular functioning, stroke prevention, and all-cause mortality.<sup>21–23</sup>

In this article we report the feasibility of using the Computerized Alcohol-Related Problems Survey (CARPS) system, a screening and health education system for older adults. A feasible screening and health education system pertaining to alcohol use in the elderly has the potential for alleviating this growing public health problem. To be feasible, patients must agree that the topic of alcohol use is important and that they learned new information about it. Also, patients should find the system is easy to use and that educational messages are pertinent and helpful in initiating behavior change. Finally, a feasible system must fit well into a busy community-based practice.

## Methods

The CARPS system feasibility study took place at Santa Monica Bay Physicians, a large community group practice, and the Center for Healthy Aging, a community health center. Patients were eligible if they were 60 years of age or older, English-speaking, and a current drinker. Current drinking was defined as at least one alcoholic drink within the past 12 months.<sup>24</sup> One alcoholic drink was defined as a 12-ounce can of beer, a 12-ounce bottle of wine cooler, a 5-ounce glass of wine, 1.5-ounce shot of hard liquor, or 1 cocktail with a 1.5-ounce shot.

## The Intervention

The CARPS has five components: (1) the Alcohol-Related Problems Survey (ARPS),<sup>25</sup> (2) computer-

ized algorithms that automatically classify each patient's drinking as nonhazardous, hazardous, or harmful, (3) a printed report of each person's drinking behavior, (4) education for each patient designed to reduce his or her risks, and (5) the capacity to store and analyze data on each patient or on groups of patients (eg, men 75 years of age or older who have made at least one visit to the practice within the past 6 months). The CARPS system is designed to be completed by the patient within 15 minutes, without requiring assistance from a health professional.

The ARPS is an 18-item self-administered screening measure that focuses on the relation between alcohol use and medical problems, medication use, and functional status.\* It includes questions on the quantity and frequency of alcohol use (including episodic heavy drinking), symptoms of alcohol abuse and dependence, driving after drinking, the presence of medical and psychiatric conditions, symptoms of disease, smoking behavior, medication use, physical function, and demographics. Using World Health Organization (WHO) terms,<sup>26</sup> the ARPS classifies patients as nonhazardous, hazardous, and harmful drinkers according to algorithms developed from combining patients' responses to the ARPS.

The specific definitions of nonhazardous, hazardous, and harmful drinking in the elderly were derived by an expert panel that used standardized panel agreement methods<sup>7</sup> to reach consensus on the classification scheme. According to the panel, nonhazardous drinking in older adults does not result in a clear risk of medical or psychosocial damage. Hazardous drinking indicates risks for future problems. Harmful drinking is defined by the presence of health problems that can be worsened by alcohol use and includes alcohol abuse or dependence. Before this feasibility study, the ARPS was pretested with a sample of 574 older adults to determine its reliability and validity. The printed report and education that now accompanies the CARPS had yet to be developed for the pretest. The ARPS, as a screening tool was, however, found to be a reliable and valid measure of alcohol abuse and dependence.<sup>25</sup> Moreover, the ARPS detected a population missed by traditional screening tools:

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\*A copy of the Alcohol-Related Problems Survey (ARPS) is available from the authors upon request.

Frequency of Drinking	Number of Drinks					
	<1	1	2	3	4	5
Less than or equal to one time per month						
Two to four times per month						
Two to three times per week						
Four or more times per week						
Daily						

Key:

Non hazardous	
Hazardous	
Harmful	

**Figure 1.** Sample indications of harmful, hazardous, and nonhazardous drinking in the elderly. Persons report that, in the past 12 months, a physician or other health care worker has told them that they had any of the following problems: hepatitis; or gastritis with stomach pains, or nausea or vomiting or heartburn most or all of the time; or ulcer of the stomach or small intestine; or pancreatitis; and they report drinking the following amounts during the past 12 months.

persons who are at risk for alcohol-related problems because of their alcohol use alone or in combination with declining health, medication use, and functional impairments. Examples of indications of nonhazardous, hazardous and harmful drinking are given in Figure 1.

The CARPS system uses an optical character recognition (OCR) system to read and store patient responses to the ARPS, although manual data entry is also possible. Once the completed ARPS has been placed into the OCR scanner, a few computer commands are required to scan and score the patient's responses and to print a patient summary report. This individualized report contains each respondent's drinking classification, the rationale behind the classification, and educational information (Figure 2). Patient data are automatically incorporated into a relational database (residing in Microsoft Access) and can be readily exported to standard statistical programs. Individual patient data can thus be aggregated and used for administrative or quality improvement activities. For this study, the database was exported into STATA6 (Stata Press, College Station, Tex) for analysis.

We used Keller's learning paradigm to guide the development of the health education component of the patient's report. Keller describes four conditions that enable people of all ages to become and remain motivated: attention, relevance, confidence, and satisfaction (ARCS).<sup>27</sup> The CARPS report form incorporates the ARCS model: attention (us-

ing examples that seem to contradict past experience); relevance (relating older person's health needs to experience); confidence (encouraging perceptions of self-efficacy by providing resources); and satisfaction (offering suggestions for reducing drinking).

### **The Evaluation**

To evaluate the usefulness and feasibility of the CARPS system, each study patient completed a 13-item evaluation questionnaire. The questionnaire asked respondents to rate each component of the CARPS in terms of ease of use and importance. Respondents were also asked whether they had ever discussed alcohol use with their physicians and whether they now planned to do so. A database for the evaluation was also established in Microsoft Access and exported to STATA 6.

### **Subjects**

Patients were approached in the waiting room. Of the 321 persons approached for participation, 73 (21%) were ineligible. Of the 73 who were ineligible, 59 (81%) did not meet the criteria for current drinking, and 14 (19%) were less than 60 years of age. About 137 were of uncertain eligibility (eg, would not provide data on age or drinking) and were not included. The main reasons given by these 137 patients for declining to provide data included not having enough time (61%) and inconvenience (12%). Of the 111 patients who were

### Attention

#### **Did You Know?**

One to two drinks a day may be safe. At this drinking level, some people may prevent heart disease or stroke. BUT, for other people, 1–2 drinks may actually be dangerous. Why? Because tolerance for alcohol decreases with age. The amount of alcohol you can drink before your senses and judgment become impaired is lower now than it was earlier in your life. Alcohol can interact with certain medications and can make some health conditions harder to treat. On the other hand, recent scientific evidence shows that small amounts may benefit those who have no risk factors like diabetes, depression or sleeping problems.

### Relevance

#### **About Your Alcohol Use**

✓ You said you drink 3 drinks a day every day

#### **About Your Health**

You said that you

- ✓ have been diagnosed with hypertension
- ✓ are on Coumadin at least once a week
- ✓ are on 6 medications regularly
- ✓ felt depressed most of the time in the past 4 weeks

#### **What Does this Mean?**

*Your alcohol use may be risky.* Here is why:

**How much should I drink?** Experts recommend that men 65 years of age and older drink 2 drinks or less per day.

**Medicine and alcohol.** Many medicines and alcohol combine together. . . You reported that you are on Coumadin. You are also taking 6 medications regularly.

**Depression and alcohol.** Alcohol can sometimes make you feel even more depressed because. . .

### Confidence and Satisfaction

#### **What Should You Do?**

✓ Here are 25 ways to drink less: Drink nonalcoholic wine or beer; put orange juice in champagne; don't drink at lunch; and don't drink alone. [Not all are listed here.]

✓ Speak to your physician about ways to reduce the amount of alcohol you drink, the medicines you are on, and your hypertension and depression.

For more information on health and alcohol use in people over 60, contact

☎ The American Association of Retired Persons at

☎ The American Geriatrics Society at

🌐 The Internet: [www.](http://www.)

Etc.

**Figure 2. Health education using the ARCS learning model: attention, relevance, confidence and satisfaction.**

eligible and willing to participate, 106 were able to complete all data-collection activities. No statistical differences in sex and ethnicity were found between the study sample and those who did not participate (sex: 54% vs 52% female; ethnicity: 89% vs 88% white, respectively).

### **Analysis**

We computed descriptive statistics on the sample's demographics (sex, age, race, and education), medical conditions, medication use, functional status, quantity and frequency of drinking, and drinking classification. We also calculated the number of binge drinkers, using the expert panel's definition of binge drinking for women as 3 or more drinks at one sitting within the past 12 months, and for men as 4 or more drinks. Furthermore, for each question in the evaluation survey, the proportion of persons endorsing each response category was calculated.

Group comparisons were performed using a 2-tailed chi-square test for categorical data. For instance, the chi-square test was used to compare the proportions of men and women and older and younger persons in each drinking classification. We also used chi-square to compare nonhazardous, hazardous, and harmful drinkers on their ratings of the importance of learning about alcohol, whether their physicians had discussed alcohol use with them, the extent to which they learned new information from their report, and whether they planned to discuss the results of the ARPS with a physician.

### **Results**

#### **Subjects**

Most of the sample of 106 patients was female (52%) and white (91%). Approximately 91% had a high school education or higher (Table 1). The mean age was 72.2 years among men and 74.1 years

**Table 1. Sample of Older Adult Patients Participating in a Screening and Health Education System.**

Characteristics	Number	Percent
Sex (n = 103)		
Male	50	48.5
Female	53	51.5
Ethnicity (n = 104)		
White, non-Latino	95	91.4
Black, non-Latino	3	2.9
Latino	5	4.8
Asian	1	0.9
Highest education (n = 103)		
12th grade or less	23	22.0
Some college or vocational school	57	55.0
Some professional, graduate school	23	22.0
Age, years (n = 105, $\chi^2 = 73.2 \pm 8.3$ )		
60–74	63	60.0
75+	42	40.0

Note: 106 patients completed the Computerized Alcohol-Related Problems Survey (CARPS), but not all answered questions about sex, ethnicity, education, and age. Numbers of patients providing information about each factor is given in parentheses in the first column. Percentages are calculated using the number of respondents for each factor as the denominator.

among women. These differences are not statistically significant. Significantly more patients were 60 to 74 years (60%) than were 75 years and older (40%). No differences were found in the proportions of women (81%) and men (88%) reporting their health as good to excellent. Similarly, no differences were found between patients 60 to 74 years (86%) and those 75 and older (83%) who rated their health as good to excellent.

About 23% of the sample of current drinkers reported drinking daily or almost daily, and 48% stated they drank more than once a week. The quantity and frequency of alcohol use ranged from less than 1 drink to more than 5 drinks per occasion. About 20% of men and 26% of women met the definition of binge drinking. Using study definitions, 48% of the sample were nonhazardous drinkers, 43% were hazardous drinkers, and 9% were harmful drinkers (Table 2).

Of the 102 patients who provided information on both sex and age (Table 3), 52 (51%) were female and 64 (63%) were 60 to 74 years old. About 9% were harmful drinkers, but no differences in harmful drinking were found between sex or age

**Table 2. Summary of Alcohol Use in 106 Older Primary Care Patients Who Currently Drink Alcohol.**

Patient Responses	Number of Patients	Percent of Patients
Frequency of alcohol use		
<1 time a month	32	30
2–4 times a month	23	22
2–5 times a week	27	25
5–7 times a week	24	23
Drinks per occasion		
1 or less	59	56
2	35	33
3 to 4	10	9
5 or more	2	2
Binge drinking		
Mean (n = 50)*	10	20
Women (n = 53)†	14	26

Note: A current drinker has had at least one drink of alcohol in the past 12 months.

\*Defined as 4 or more drinks per occasion within the past 12 months.

†Defined as 3 or more drinks per occasion within the past 12 months.

groups. Chi-square testing showed harmful drinkers tended to be male in the 60 to 74 age-group ( $P = .018$ ,  $df = 1$ ). About 44% of the sample was classified as hazardous drinkers, but no differences in hazardous drinking were found in sex or age-groups. About 47% of the sample were nonhazardous drinkers, with no difference in sex or age-group.

Many patients in the sample had medical conditions that are affected by alcohol, such as hypertension (51%) and depression (15%) (Table 4). In

**Table 3. Nonhazardous, Hazardous, and Harmful Drinking, by Sex and Age.**

Drinking Classification	Men (n = 50) No. (%)	Women (n = 52) No. (%)
Nonhazardous (n = 48)		
60–74 years	15 (30)	14 (27)
75+ years	8 (16)	11 (21)
Hazardous (n = 48)		
60–74 years	15 (30)	14 (27)
75+ years	7 (14)	12 (23)
Harmful (n = 9)		
60–74 years	5 (10)	1 (2)
75+ years	0 (0)	3 (6)

Note: 4 respondents did not provide data on sex and age.

**Table 4. Medical Problems in Older Primary Care Patients (n = 104)**

Problem	Patients With Problem No. (%)
Hypertension	55 (51)
Osteoporosis	
Women	13 (25)
Men	3 (6)
Depression	16 (15)
Diabetes	12 (11)
Congestive heart failure	9 (8)

addition, nearly two fifths of patients were taking antihypertensive medication, and 20% were on nonsteroidal anti-inflammatory agents (Table 5). These medications can adversely interact with alcohol when taken daily or nearly every day. About 20% of patients reported some limitation in advanced activities of daily living because of their health (eg, walking one block or climbing one flight of stairs).

The median time for patients to complete the CARPS and related study materials (eg, informed consent, evaluation) was 15 minutes. About 93% of patients indicated the ARPS was easy to understand, and 96% had no difficulty completing it

**Table 5. Medication Use in Older Primary Care Patients (n = 106).**

Medication*	Patients Taking Medication No. (%)
Antihypertensives	41 (39)
Cardizem, Procardia, Vasotec, Lotensin, atenolol, Inderal, water pills	
Arthritis pain killers	22 (21)
Motrin or Advil, Voltaren, Clinoril, Naprosyn, Tylenol	
Sedatives, sleeping medications	17 (16)
Valium, Dalmane, Librium, Xanax, Activin, Halcion, chloral hydrate	
Nonprescription antihistamines	13 (12)
Tylenol PM, Benadryl, Chlor-Trimeton, others	
$\beta$ -Blockers	12 (1)
Stomach and ulcer medications, such as Zantac, Tagamet, Prilosec, Pepcid	

\*Patients were asked whether they took these medications every day or nearly every day. They were given examples of such medications by brand or commonly recognized name.

**Table 6. Evaluation of a Screening and Health Education System.**

Statement	Patients Agreeing No. (%)
CARPS is easy to understand (n = 100)	93 (93)
Patient had little or no trouble completing CARPS (n = 98)	94 (96)
Alcohol use is an important topic (n = 100)	85 (85)*
Patient has discussed alcohol use with physician (n = 98)	22 (22) <sup>†</sup>
Patient learned new information (n = 97)	65 (67)
Patient says others could learn new information (n = 98)	95 (97)
Patient agrees others could use information to change (n = 96)	65 (68)
Patient plans to discuss results with physician (n = 98)	30 (31)

CARPS—Computerized Alcohol-Related Problems Survey.

\*Chi-square test for hazardous and harmful drinkers statistically significant:  $P = .005$ ,  $df = 2$ .

<sup>†</sup>Chi-square test for hazardous and harmful drinkers statistically significant:  $P = .000$ ,  $df = 2$ .

(Table 6). Approximately 85% stated that alcohol use is an important topic among older persons, but 22% stated that they had ever discussed alcohol use with a physician. Almost 67% of patients reported that they learned new information from their summary and education report, while 97% stated that others could learn new information from a report such as theirs. Nearly one third reported that they planned to discuss their report with a physician.

We performed chi-square tests to determine whether there were relations between patients' drinking classification and evaluations of the CARPS (Table 6). Compared with nonhazardous and hazardous drinkers, harmful drinkers were less likely to believe that alcohol use in older adults is an important topic ( $P = .005$ ,  $df = 2$ .) When compared with other drinkers, however, harmful drinkers reported discussing alcohol use with a physician significantly more frequently ( $P = .000$ ,  $df = 2$ .) We found no significant differences in drinking classification among patients who stated that they learned something new from the report, that others could use the information to change, and that they intended to discuss their report with a physician.

## Discussion

The CARPS screening and health education system appears feasible for use in community-based practices. Nearly all study patients were able to

complete the ARPS while waiting for their physician's appointment without assistance by a health professional. Of the 111 eligible patients who filled out the ARPS, the software and equipment were able to process responses, classify patients, and generate an individualized report for 106. We encountered technical difficulties with 4 patients.

About 20% of patients did not complete the ARPS in one sitting because they were called into the clinic or had to stop and restart the survey for other reasons (eg, to fill out other forms, go to the restroom, add money to parking meter). The 15-minute median time for completion overestimates the actual time needed, because within that time patients also completed informed consent and participant payment forms for study purposes. In actual practice, these forms would not be necessary.

The information provided by the CARPS was well-regarded by study participants, with 85% of the sample agreeing that alcohol use among older adults is an important topic. About 67% of patients reported learning new information about alcohol use, and 97% thought that others could benefit similarly. The gap between self and others might be an indication of the stigma surrounding the issue of alcohol use or of patients' lack of knowledge about the importance to all older persons who drink of alcohol-related risks and problems. Further research is needed regarding the extent to which the educational gains associated with this screening and education system result in behavioral change.

Despite the perceived importance of the topic, 78% of the sample reported that they had never discussed alcohol use with a physician. This result is consistent with other studies which have shown that physicians often overlook alcohol risks and problems in the elderly.<sup>15</sup> About 68% of the sample thought that other persons might want to discuss the results of their survey with their physicians, but only 31% of patients reported that they themselves planned to do so. Research is needed to determine whether these discussions take place and the extent to which they improve communication between physician and patient. Evidence already exists that brief interventions on the part of physicians are effective in reducing alcohol use in the elderly.<sup>28</sup>

Potentially risky alcohol use was frequent in this sample of current drinkers. About 20% of men and 26% of women were binge drinkers. About 9% were harmful drinkers, whereas 41% were at-risk for alcohol-related problems. These propor-

tions might be explained by the sizable number of patients who had medical conditions known to be affected by alcohol, who were on medications that could be adversely affected by alcohol use, or who were limited in functional status. This sample was not unusual in its alcohol use and risks. Alcohol use in excess of recommended limits is common in primary care practices,<sup>19</sup> and hazardous and harmful drinking is frequent.<sup>17</sup>

A relatively large body of research data indicate that interventions by primary care physicians alter patients' drinking patterns.<sup>19,28-30</sup> Recommendations on how to approach these problems in practice have been made by the Institute of Medicine,<sup>31</sup> the National Institute on Alcohol Abuse and Alcoholism,<sup>32</sup> the US Preventive Services Task Force,<sup>33</sup> the American Medical Association,<sup>2</sup> and the American Geriatrics Society.<sup>34</sup> The recommendations include universal screening, conducting detailed assessments of patients with known or suspected problems, and providing appropriate levels of advice and counseling, such as brief interventions for persons at-risk and referrals to appropriate specialty services for drinkers with problems. The American Geriatrics Society recommends that physicians screen the elderly once a year for alcohol misuse.

Screening and education systems like the CARPS can provide physicians and other health care workers with detailed clinical information regarding older patients' alcohol-related risks and problems and thus aid in pursuing the recommendations for assessment and management. In fact, after reviewing the results, physicians practicing at the study site decided to organize a continuing medical education seminar on alcohol use and the elderly to consider methods of decreasing the numbers of hazardous and harmful drinkers while encouraging nonhazardous alcohol use among their patients. They also agreed that alcohol use in the elderly might be an important topic for their routine quality improvement activities.

The results of this study should be interpreted with the understanding that in this sample the participating patients were primarily white and highly educated. Research is needed to study the feasibility of using combined screening and health education systems in other demographic groups. Moreover, this study used a consecutive sample and was limited to participants who were eligible and present at the test sites during the period of enrollment. Also,

these findings are based on self-reported usual use of alcohol, which although reliable, might give a lower estimate of alcohol consumption than diary methods among elderly people<sup>35</sup>; actual consumption may be greater than accounted for in this study. Finally, because the design of this study did not include assessment after CARPS participation, more information is needed on how screening and health education systems affect patient behavior and health outcomes. Nevertheless, the data suggest that older patients are willing to complete screening surveys while they wait for health appointments. Our findings also suggest that computerized screening and education systems might be useful in assisting primary care physicians to detect problematic alcohol use in an unobtrusive and efficient manner.

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