

Tobacco and Alcohol Abuse: Clinical Opportunities for Effective Intervention

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No behaviors are more costly to the United States from a health or economic perspective than tobacco and alcohol use. One of the primary strategies available to mitigate this exacting toll is to identify and clinically treat the 25% of adults in America who smoke and the 20% of adults who drink alcohol above recommended limits. During the last two decades, researchers have identified a series of brief clinical interventions that can markedly reduce alcohol and tobacco use and significantly decrease the health burdens resulting from such use. This review outlines office-based clinical interventions and the organizational policies that support these interventions that have been shown to decrease tobacco and alcohol use.

During this century, modifiable health-risk behaviors have assumed an increasingly important role as causes of morbidity and mortality in the United States. Chief among these modifiable behaviors are tobacco and alcohol use. Currently, 25% of all adults in America smoke (1) and 20% of adults drink alcohol above recommended limits (2). Together, these two substances account for almost 550,000 deaths per year in the United States, $\approx 25\%$ of all deaths in this nation.

One of the primary strategies available to mitigate the toll on society exacted by tobacco and excessive alcohol use is to identify and treat this population in clinical settings. A number of screening methods have been developed to identify persons who use tobacco products as well as individuals who use alcohol above recommended limits. These methods are sensitive and specific, and similar in accuracy to screening tests for other common health problems.

During the last two decades, researchers have also identified a series of brief clinical interventions that can impact alcohol and tobacco use and signifi-

cantly decrease the health burdens resulting from such use. From a public health perspective, these brief clinical interventions hold great promise because of the high proportion of tobacco and alcohol users who visit a primary care physician each year. Specifically, 70% of smokers (3) report seeing a physician each year. This review will outline office-based clinical interventions, which often combine brief counseling with pharmacotherapy, that have been shown to decrease tobacco and alcohol use. It will also address organizational policies that support and enhance physician efforts to implement these clinical interventions. The goal is to better equip clinicians to get the most out of their unique access to these populations.

EFFECTIVE CLINICAL INTERVENTIONS WITH TOBACCO AND ALCOHOL

Tobacco

Tobacco use has been identified as the leading preventable cause of illness and death in the United States, resulting in more than 400,000 deaths, more than \$50 billion in direct health care costs, and a staggering amount of morbidity annually (4). Diseases attributable to smoking include cancer (lip, oral cavity, larynx, esophagus, pharynx, lung, bladder, pancreas, and kidney), chronic obstructive lung disease, and cardiovascular disease. Smoking has been implicated in adverse outcomes of pregnancy including low birth weight and intrauterine growth retardation. Moreover,

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exposure to secondhand smoke is associated with asthma, an increased number of upper respiratory infections, lung cancer, decreased pulmonary function, and cardiovascular disease in nonsmokers (5).

While $\approx 70\%$ of both adolescent and adult smokers report that they would like to quit (6), 25% of adult Americans continue to smoke (1) and more than 3000 adolescents become regular tobacco users each day (7). The powerfully addictive nature of nicotine has been identified as the chief reason for the continued use of this dangerous drug (8).

Seven out of 10 tobacco users see a primary care clinician each year (3), yet less than half of these smokers report that their clinician provided them with specific advice on how to quit successfully (3,9). To help clinicians better utilize their extraordinary opportunity, the United States Agency for Health Care Policy and Research (AHCPR) sponsored the *Smoking Cessation: Clinical Practice Guideline No. 18* (10). The guideline, an evidence-based document, was developed by a panel of 18 independent experts. The panel identified two chief goals at the start of their deliberations: 1) to determine which clinician interventions promote smoking cessation and which do not; and 2) to identify strategies that will institutionalize effective interventions such that they become an expected part of every clinical encounter. The panel systematically reviewed the tobacco cessation literature published between 1976 and 1994 (more than 3000 articles) and conducted more than 50 formal meta-analyses. Approximately 70 additional individuals peer reviewed the guideline prior to its publication in April 1996.

The heart of the AHCPR's smoking cessation guideline is a series of recommendations for primary care clinicians (Table 1). These five recommendations form the basis of a brief screening and intervention approach designed to be completed within ≈ 3 min. This brief intervention was estimated to approximately double sustained cessation rates among smokers presenting to a primary care setting. Specifically, the AHCPR meta-analyses determined that primary care clinicians can expect to achieve a clinicwide long-term (1 year or more) cessation rate of about 15% of tobacco users each year. This contrasts with the population-based data indicating that only about 7% of smokers who try to quit on their own each year achieve long-term cessation (11). If adopted nationally, the impact of brief clinical intervention would be ≈ 1 million new quitters each year.

The guideline panel urged that brief clinical intervention be provided as the new standard of care for all patients who smoke. This standard dictates that, as part of every encounter with a tobacco user, the clinician provides a brief smoking cessation intervention,

irrespective of the condition that brought the patient to the health care facility.

In practice, this standard would require each clinic to adopt institutional changes that ensure that tobacco-use screening is systematically completed. Fortunately, tobacco dependence is probably the easiest form of drug use to screen for, since most individuals who use tobacco also meet diagnostic criteria for dependence (12). In practice, this means that accurate screening can usually be accomplished by asking a single question: "Do you use tobacco?" Expanding the vital signs to include smoking status, as recommended in the guideline (Fig. 1), is an effective way to ensure that this vital information is collected from every patient. This simple, low-cost modification of clinic procedure has been shown by itself to about double the rate that clinicians address tobacco use among patients who smoke (13). An additional useful assessment tool for tobacco use is the Fagerstrom Tolerance Questionnaire (14). This instrument collects quantity-frequency data such as number of cigarettes smoked and time of first daily smoke.

Once a tobacco user is identified through a systematic screening procedure such as the expanded vital signs, the guideline recommends that the clinician urge the patient, in a clear, strong, and personalized way, to quit, and then asks if s/he is willing to quit at this time. If unwilling to quit, a brief motivation message is given to heighten interest in quitting on a subsequent clinic visit. For tobacco users willing to quit at this time, clinicians are urged to: 1) provide social support; 2) provide some simple advice on quitting successfully; and 3) urge the patient to use pharmacotherapy. Each of these interventions was shown to independently increase long-term quit rates. Moreover, alcohol use should be minimized as this is a major risk factor for relapse to smoking.

Current health care utilization patterns highlight the critical role of the primary care clinician in the identification and treatment of nicotine addiction (1). These same utilization patterns, however, mask the potential contribution of the specialty physician. In particular, the specialist is often well placed to intervene with high-risk populations including pregnant women, adolescent smokers, and patients with comorbid medical problems. For example, some of the highest rates of smoking cessation have been achieved among patients during the immediate post-acute myocardial infarction period (15). Yet, specialty physicians have underutilized their opportunity to intervene with patients who smoke. A recent survey of physicians documented that a smoker is currently twice as likely to receive smoking cessation counseling during a primary care visit than during a visit to a specialist (16).

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Table 1. AHCPR clinical practice guideline for smoking cessation (no. 18): Recommendations for physicians in promoting smoking cessation among clinic patients

Step 1. ASK: Systematically identify all tobacco users at every visit.

Action: Implement an officewide system that ensures that, for *every* patient at *every* clinic visit, tobacco-use status is queried and documented.

Strategies for implementation:

Expand the vital signs to include tobacco use:

- Data collected by health care team.
- Can be implemented using preprinted progress note paper that includes the expanded vital signs, a vital signs stamp, or, for computerized records, an item assessing tobacco-use status.
- Alternatives to the vital sign stamp are to place tobacco-use status stickers on all patient charts or to indicate smoking status using computer reminder systems.

Step 2. ADVISE: Strongly urge all smokers to quit.

Action: In a *clear, strong, and personalized* manner, urge every smoker to quit.

Strategies for implementation:

Advice should be:

- Clear: "I think it is important for you to quit smoking now and I will help you. Cutting down while you are ill is not enough."
- Strong: "As your clinician, I need you to know that quitting smoking is the most important thing you can do to protect your current and future health."
- Personalized: tie smoking to current health or illness and the social and economic costs of tobacco use, motivation level and readiness to quit, and the impact of smoking on children and others in the household. Encourage clinic staff to reinforce the cessation message and support the patient's quit attempt.

Step 3. IDENTIFY: Smokers willing to make a quit attempt.

Action: Ask every smoker if he or she is willing to make a quit attempt at this time.

Strategies for implementation:

- If the patient is willing to make a quit attempt at this time, provide assistance (see Step 4).
- If the patient prefers a more intensive treatment, refer to interventions administered by a smoking cessation specialist and follow up with the patient regarding quitting.
- If the patient clearly states he or she is not willing to make a quit attempt at this time, provide a motivational intervention.

Step 4. ASSIST: Aid the patient in quitting.

Action: Help the patient with a quit plan.

Strategies for implementation:

Set a quit date: Ideally, the quit date should be within 2 weeks, taking patient preference into account.

A patient's preparations for quitting:

- Inform family, friends, and coworkers of quitting and request understanding and support.
- Remove cigarettes from your environment. Prior to quitting, avoid smoking in places where you spend a lot of time (e.g., home, car).
- Review previous quit attempts. What helped you? What led to relapse?
- Anticipate challenges to planned quit attempt, particularly during the critical first few weeks.

Action: Offer nicotine replacement therapy (NRT) or bupropion except in special circumstances.

- Offer nicotine patch therapy as the primary pharmacotherapy if the patient smokes 15 or more cigarettes/day. Clinical judgment should be used in prescribing the patch for patients who smoke fewer than 15 cigarettes/day.
- Offer nicotine gum therapy as a pharmacotherapy, particularly if the patient prefers nicotine gum to the nicotine patch or smokes fewer than 15 cigarettes/day.
- Offer nasal spray as a pharmacotherapy, especially for heavy smokers.
- Offer inhaler as a pharmacotherapy, either alone or in combination with NRT.
- Bupropion SR: A non-nicotine medication effective for smoking cessation when used either alone or in combination with NRT.

Action: Give key advice on successful quitting.

- Total abstinence is essential. "Not even a single puff after the quit date."
- Drinking alcohol is highly associated with relapse. Those who stop smoking should review their alcohol use and consider limiting their alcohol or abstaining from alcohol during the quit process.
- The presence of other smokers in the household, particularly a spouse, is associated with lower success rates. Patients should consider quitting with their significant others or developing specific plans to stay quit in a household where others still smoke.

Action: Provide supplementary materials.

- Sources: Federal agencies, including AHCPR; nonprofit agencies; or local and state health departments.
- Salient characteristics: Culturally/racially/educationally appropriate for the patient.
- Location: Readily available in every clinic office.

Step 5. ARRANGE: Schedule follow-up contact.

Action: Schedule follow-up contact, either in person or via telephone.

Strategies for implementation:

- First follow-up contact should be within 2 weeks of the quit date, preferably during the first week. A second follow-up contact is recommended within the first month. Schedule further follow-up contacts as indicated.
- Congratulate success. If a lapse occurred, review circumstances and elicit recommitment to total abstinence. Remind patient that a lapse can be used as a learning experience and is *not* a sign of failure. Identify problems already encountered and anticipate challenges in the immediate future.

application of the standard of care described previously. In so doing, panel members recognized the importance of enlisting a wide range of physicians (primary care *and* specialty) and other health care providers in an effort to reduce tobacco use among all patients who smoke.

In addition to *Smoking Cessation: Clinical Practice Guideline No. 18*, the AHCPR has published a series of reference materials that summarize the guideline recommendations for four specific audiences: 1) clinicians (physicians, dentists, nurses, allied health professionals); 2) cessation specialists; 3) health care administrators, insurers, managed care organizations, and purchasers; and 4) patients. Both the guideline and these quick reference guides can be obtained through the AHCPR's Web site: www.ahcpr.gov/clinic/, or from the AHCPR Publications Clearinghouse at 800-358-9295.

Alcohol

SCREENING WITH ALCOHOL USERS. A number of alcohol-screening instruments have been tested and validated in clinical settings. Screening questions administered by direct interview as part of routine clinical care include alcohol use quantity/frequency, binge drinking, and the four CAGE questions (see Table 2). Screening questionnaires developed for pencil and paper or computer administration include the Alcohol Use Disorder Inventory Test (AUDIT; 17), the Health Screening Survey (HSS; 18), and PRIME-MD (19). While a number of laboratory tests have been developed to detect alcohol use disorders such as gamma glutamyl transferase (GGT), mean corpuscular volume, carbohydrate deficient transferrin (CDT), and blood alcohol levels, these tests have limited value as screening tests. Research suggests that each of these lab tests will identify just one in five persons who drink above recommended limits (20-23).

Quantity/frequency questions, as recommended in the National Institute on Alcohol Abuse and Alcoholism's *Physicians' Guide* (24), are the current standard of practice used by the majority of physicians (Table 2). They have a number of strengths and compose the only alcohol screening test that provides a di-

rect estimate of alcohol-related risk. For example, men who drink 4 or more standard U.S. drinks per day have a two-fold risk of developing stroke and liver failure compared to men who drink 1-2 standard drinks per day (25). Quantity/frequency questions are sensitive and have a low rate of false positive responses. They are more sensitive than the CAGE for the detection of persons drinking above recommended limits (26). The primary weakness of quantity/frequency questions is underreporting, especially by persons who are alcohol dependent or intoxicated. This problem can be minimized with appropriate interview techniques (a direct, nonjudgmental approach), collaborative reports (family member reports and medical record review), and laboratory tests (breathalyzer, blood alcohol levels, GGT, and CDT).

The CAGE is a set of four questions developed by Ewing (27) to detect dependent drinkers (Table 2). It is sensitive and specific for the identification of persons who meet criteria for alcohol abuse and dependence (28,29). These inquiries can be incorporated into general health questions such as the PRIME-MD (19) or the Health Screening Survey (18). The PRIME-MD is an instrument used to screen patients for mental health and alcohol use disorders (19). It includes the CAGE questions and two consumption questions. As with screening for tobacco use, alcohol-screening tests can be administered by pencil and paper, direct interview, or computer. Weaknesses include: 1) the observation that physicians do not like to use the CAGE questions (30); 2) the CAGE questions miss as many as 50% of at-risk drinkers (29); and 3) false positive tests are common, especially with women.

The 10-question AUDIT (17) has been widely tested as a screening/assessment questionnaire (31). Scores of 8-15 suggest at-risk and problem drinking, while scores of greater than 15 suggest alcohol dependence. The test has been validated using the DSM-IIIIR (32) and the MAST (33) as criteria standards, and has a sensitivity of 50%-80% depending on the study population and cutoff score.

CLINICAL INTERVENTIONS WITH ALCOHOL USERS. Alcohol brief interventions are time-limited counseling strategies that focus on reducing alcohol use in nondependent drinkers (34-38). A model intervention is shown in Figure 2. These techniques may also be useful in motivating dependent drinkers to seek specialized treatment in alcohol treatment programs. Brief intervention procedures include: 1) assessment and direct feedback ("As your physician, I am concerned about how much you drink and how it is affecting your health."); 2) contracting and goal setting ("You need to cut down on your drinking. What do you think

VITAL SIGNS

Blood Pressure: _____
 Pulse: _____ Weight: _____
 Temperature: _____
 Respiratory Rate: _____
 Tobacco Use: Current Former Never
 (circle one)

Figure 1. Expanded vital signs stamp including smoking status.

Table 2. Screening and brief intervention procedures: Quantity/frequency questions and the CAGE questionnaire

Ask all patients:

Do you drink alcohol, including beer, wine, or distilled spirits?

Ask current drinkers about alcohol consumption:

On average, how many days per week do you drink alcohol?

On a typical day when you drink, how many drinks do you have?

What is the maximum number of drinks you had on any given occasion during the last month?

Ask current drinkers the CAGE questions:

Have you ever felt that you should Cut down on your drinking?

Have people Annoyed you by criticizing your drinking?

Have you ever felt bad or Guilty about your drinking?

Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover (Eye opener)?

about cutting down to 3 drinks 2–3 times per week?”); 3) behavioral modification techniques (“Here is a list of situations when people drink and sometimes lose control of their drinking. Let’s talk about ways you can avoid these situations.”); and 4) self-help–directed bibliotherapy (24). These methods are particularly applicable to primary care practices that fit alcohol treatment into the context of busy, high-volume practice settings with multiple competing prevention agendas.

Numerous randomized clinical trials have been conducted to test the efficacy of brief advice in reducing alcohol use, adverse effects, and health care utilization. The studies were conducted in hospital settings (38), primary care clinics (34,39), student health clinics (40), and clinical research settings (37). The majority of trials were positive with reductions in alcohol use of up to 30% (41). A meta-analysis conducted by Wilk et al. (42) pooled data from 12 trials and found a combined odds ratio of 1.9 with a confidence interval of 1.6–2.2 in favor of brief alcohol interventions over no intervention.

The brief-advice intervention procedures varied by trial, but most consisted of a brief 5–20-min counseling session with a variable number of follow-up counseling sessions. Physicians, nurses, community health care assistants, and researchers were the primary intervenors. Subjects were recruited utilizing a variety of methods including newspaper advertising (37), mailed health surveys (43), and screening during routine medical care (34,39,44).

The Medical Research Council trial (45) and Project TrEAT (Trial for Early Alcohol Treatment; 34) provide the best evidence that brief physician advice can result in sustained reductions in alcohol use. The Medical Research Council conducted a brief alcohol intervention trial in the offices of 45 general practitioners in Great Britain. Nine hundred nine patients drinking above recommended limits of alcohol were randomized into a control or brief counseling group. The counseling intervention was delivered by

the subject’s personal physician in the context of a regular office visit. At 12 months, there were significant reductions in total alcohol use, binge drinking, and GGT levels in the male experimental group compared to the control group.

Project TrEAT was designed to replicate the Medical Research Council trial in the U.S. health care system. Forty-six male physicians and 18 female physicians practicing in 17 different Wisconsin clinics participated in the trial. 774 patients were randomized to a treatment or control group. At the time of the 12-month follow-up (93.4% follow-up rate), there was a significant reduction in 7-day alcohol use ($t = 4.33$, $p < .001$), episodes of binge drinking ($t = 2.81$, $p < .001$), and frequency of excessive drinking ($t = 4.53$, $p < .001$). The greatest reductions occurred in the female experimental group, in which use decreased 47% at

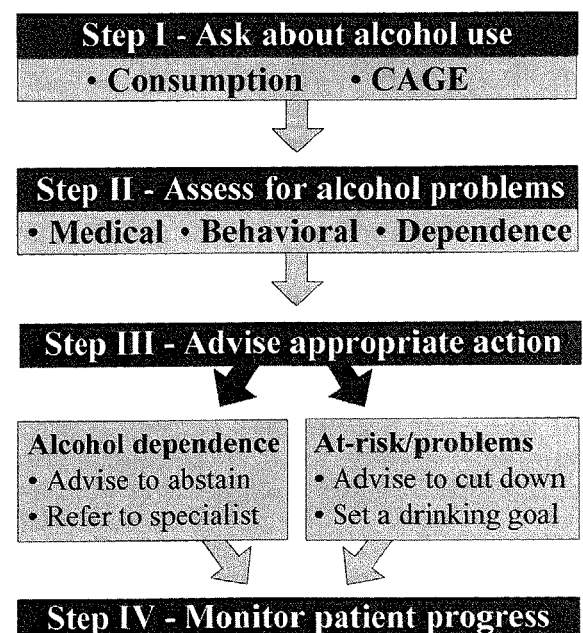


Figure 2. Steps for alcohol screening and brief intervention.

12 months (14.8 decreased to 8.08 drinks per week). Chi-square tests of independence revealed a significant relationship between group status and lengths of hospitalization during the study period for men ($p < .01$). There were too few emergency room visits and hospitalizations for the female sample to detect a statistical difference. This trial demonstrated that physicians can be trained to conduct brief interventions in community-based HMO practices, physicians can reduce alcohol use in problem drinkers, and women respond to brief-advice treatment.

ALCOHOL AND TOBACCO COMORBIDITY

The close association between alcohol and tobacco use has been well documented. Studies suggest that 60%–90% of persons who are alcohol dependent use tobacco products on a regular basis, with persons surveyed in alcohol treatment programs having the highest rates of tobacco use (46). It has also been noted that the greater the amount of alcohol consumed, the higher the rate of tobacco use. Manwell et al. noted that persons who drank more than 21 drinks per week were two and one half times more likely to smoke cigarettes than persons who drank less than 7 drinks per week (56% versus 22%; 47). Persons who use tobacco products on a regular basis have a two-fold risk of being alcohol dependent (10% versus 5%; 47).

Smokers who are alcohol dependent have much lower quit rates than nonalcoholics. DiFranza and Guerra interviewed 77 alcohol-dependent smokers participating in an inpatient alcohol treatment and found that only 7% had been able to quit smoking compared to a 49% matched control group of nonalcoholic smokers (48). Studies conducted by Hughes found 7% quit rates in recovering alcoholics compared to 19% in persons with no history of alcohol or drug dependence (49). Gulliver and Rohsenow found a strong association between craving for alcohol and craving for a cigarette in a sample of alcohol-dependent patients who were trying to quit drinking and smoking (50). A shared neurochemical mechanism through opioid and dopamine receptors may underlie both addictions.

The role of pharmacotherapy in alcoholic smokers has not been well delineated. Because many alcoholics are very heavy smokers, nicotine replacement therapy in combination with drugs such as bupropion hold great promise and may increase the tobacco quit rates in alcohol-dependent patients. While continued alcohol use is a major predictor of smoking cessation failure, there is little evidence to support the notion that alcohol and nicotine dependence should be treated separately, or that treatment should focus on

alcohol only. Ongoing studies are expected to increase our understanding of effective treatment methods for alcohol and tobacco dependence.

CHANGING PHYSICIAN BEHAVIOR

Davis et al. (51) surveyed the physician performance literature from 1975 to 1994 and found 160 intervention studies, 99 of which were randomized clinical trials. Seventy percent of these interventions reported changes in physician performance and 48% reported positive health outcomes. Formal continuing medical education courses using lectures and handouts had limited impact. Educational programs including peer discussion and skills practice sessions were more effective than programs limited to lectures. The most effective strategies included physician-reminder checklists, patient-mediated interventions, outreach visits, academic detailing, and opinion leaders.

Effective group education strategies include: 1) conducting the educational programs on site at the physician's clinic or hospital; 2) use of specific, step-by-step, evidence-based, clinical protocols; 3) peer group discussion; 4) skills-based role-playing; and 5) use of a credible expert trainer-educator. Educational programs are also more effective when used in combination with the other intervention strategies (51) such as peer feedback and changes in clinic-level systems. Schwartz and Cohen (52) describe education as "provision of new information," which is often necessary but is usually not sufficient to change behavior. Physicians often require strong evidence before they will consider behavior to have changed. Interventions that rely solely on education and don't address the complex behavioral and organizational factors that influence behavior usually are not successful in changing behavior. Soumerai and Avorn (53) note in studies with physicians that "brevity, repetition and reinforcement of recommended practices" were key components to educational programs.

Educational programs conducted for health care professionals on tobacco and alcohol screening should incorporate the findings of these reports. Clinicians need the opportunity to become more comfortable with screening questions and interview techniques. They need to say the "words" and to learn to focus as much on what patients don't say (i.e., nonverbal cues) as what patients do say. Role-playing with colleagues, standardized patients (persons trained to play a specific role), or recovering persons are effective strategies to teach physicians how to screen patients for problems with tobacco and alcohol use. Role-playing can be conducted in a large group using a paired role-play technique (workshop participants turn to the per-

son next to them) or in small-group sessions. There is no substitute for practice and repetition.

Peer-review feedback is increasingly used by managed care organizations to modify and change physician behavior, especially in the prevention area (e.g., immunizations and cancer prevention activities) and has been shown to increase rates of substance abuse intervention (10). Examples of effective feedback include confidential performance reviews based on medical record reviews, written feedback by quality assurance committees, and feedback derived from patient satisfaction questionnaires. According to Greco and Eisenberg (54), feedback includes various ways of giving health care providers information about their practice performance and patient outcomes compared with those of other providers.

Feedback can be used to introduce a new procedure or it can be part of an overall clinic quality assurance system. Eisenberg and Williams (55) suggest that feedback plays on the provider's sense of achievement and desire to excel. Through more than 30 years of research, Bowers and Franklin (56) have shown that organizational change can be greatly facilitated when data about systems functioning are collected, fed back to members, and used to provide opportunities for diagnosis and action.

CHANGING SYSTEM BEHAVIOR

Managed health care systems strive toward the dual goals of improving health and reducing health care costs. Thus, they are ideal venues for the delivery of cost-effective preventive interventions such as those for tobacco or alcohol abuse. Yet managed care organizations (MCOs) do not consistently provide such services to their patients, despite the existence of well-documented effectiveness. A 1996 survey of 320 health maintenance organizations documented that only 61% of enrollees who were smokers (or recent quitters) reported that they were advised to quit by their health care provider during the past year (57).

Regarding tobacco addiction, the AHCPR smoking cessation guideline recognized that health care system administrators, purchasers, and insurers can play a critical role in the implementation of practice-based recommendations. It targeted this audience with six system-level strategies to support and institutionalize clinician-level interventions (Table 3). Two related research initiatives consider the cost-effectiveness and feasibility of the AHCPR panel's recommendations.

A 1996 analysis of the cost-effectiveness of AHCPR guideline recommendations determined that smoking cessation relative to other medical interventions is cost-effective, with a cost of \$2875 per life-year saved (58). A second initiative, supported by the Robert Wood Johnson Foundation (RWJF), promises to yield additional information regarding the feasibility and impact of the implementation of AHCPR guideline recommendations. The RWJF's new program, Addressing Tobacco in Managed Care, will support projects that evaluate the effectiveness of organizational strategies that lead health care providers, practices, and plans to adopt and adhere to AHCPR guideline recommendations.

Like the AHCPR clinical practice smoking cessation guidelines, a recent national consensus panel convened by the Center for Substance Abuse Prevention acknowledged the critical role of purchasers, payers, and health care system insurers in the implementation of alcohol screening and intervention procedures (59). This panel recommended the system-wide implementation of alcohol screening and brief intervention in primary care settings. A recent study conducted on the cost benefit of brief physician intervention with problem drinkers supported this recommendation. The report found that the benefit-cost ratio was 6.6:1.0, or \$66,224 in benefits for every \$10,000 invested (60).

SUMMARY

The U.S. health care system offers a great opportunity to identify and treat the majority of people in the

Table 3. AHCPR clinical practice guideline for smoking cessation (no. 18): Recommendations for health care administrators, insurers, and purchasers

Strategy 1: Implement a tobacco-user identification system in every clinic.
Strategy 2: Provide education, resources, and feedback to promote provider intervention.
Strategy 3: Dedicate staff to provide smoking cessation treatment identified as effective in this guideline and assess the delivery of this treatment in staff performance evaluations.
Strategy 4: Promote hospital policies that support and provide smoking cessation services.
Strategy 5: Include smoking cessation treatment (both pharmacotherapy and counseling), identified as effective in this guideline, as paid services for all subscribers of health insurance packages.
Strategy 6: Reimburse fee-for-service clinicians for delivery of effective smoking cessation treatments and include these interventions among the defined duties of salaried clinicians.

United States who are adversely affected by tobacco and alcohol use disorders. A number of screening tests exist that are specific and sensitive for these disorders. Brief intervention trials suggest that brief advice counseling can reduce levels of drinking, tobacco use, and health care utilization. The challenge, however, is to incorporate screening and brief intervention procedures for tobacco and alcohol use into the context of other clinical activities and prevention programs in these systems of care. For example, screening for immunization status, breast cancer, prostate cancer, and cholesterol have become high priorities in many managed care systems. Tobacco and alcohol screening and intervention will need to compete and fit in with these other procedures and priorities. Research efforts are needed that evaluate the impact of institutional changes that systematically address alcohol and tobacco use.

Changing physician behavior to address tobacco and alcohol abuse effectively is a complex endeavor. To be most effective, such behavioral change will require a collaborative effort among physicians, clinical staff, and clinical administrators. The potential impact of the screening and brief intervention strategies that result from such collaboration is enormous—a decrease in the greatest public health threat in the United States today, alcohol and tobacco use.

REFERENCES

- Centers for Disease Control. Cigarette smoking among adults—United States and changes in the definition of current smoking. *MMWR* 1994 **43**: 342–346, 1992.
- U.S. Department of Health and Human Services (DHHS). *National household survey on drug abuse: Population estimates 1995*. Washington, DC: DHHS, Public Health Service, Substance Abuse and Mental Health Services Administration, 1996.
- Centers for Disease Control. Physicians and other health care professional counseling of smokers to quit—United States. *MMWR* 1993 **42**: 854–857, 1991.
- U.S. Department of Health and Human Services (DHHS). *Reducing the health consequences of smoking: 25 years of progress. A report of the surgeon general*. DHHS publication no. (CDC) 89–8411. Washington, DC: DHHS, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1989.
- U.S. Department of Health and Human Services (DHHS). *The health consequences of involuntary smoking: A report of the surgeon general*. DHHS publication no. PHS 87–8398. Washington, DC: DHHS, Public Health Service, Office of the Assistant Secretary for Health, Office of Smoking and Health, 1986.
- U.S. Department of Health and Human Services (DHHS). *Preventing tobacco use among young people. A report of the surgeon general*. Washington, DC: DHHS, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1994.
- Pierce J.P., Fiore M.C., Novotny T.E., et al. Trends in cigarette smoking in the United States. *JAMA*. **261**: 56–60, 1989.
- U.S. Department of Health and Human Services (DHHS). *The health consequences of smoking: Nicotine addiction. A report of the surgeon general*. DHHS Publication no. (CDC) 88–8406. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1988.
- Anda R.F., Remington P.L., Sienko D.G., and Davis R.M. Are physicians advising smokers to quit? The patient's perspective. *JAMA* **257**: 1916–1919, 1987.
- Fiore M.C., Bailey W.C., Cohen S.J., et al. *Smoking cessation. Clinical practice guideline no. 18*. AHCPR Publication no. 96–0692. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research, 1996.
- Hatziendreu E.J., Pierce J.P., Lefkopoulou M., et al. Quitting smoking in the United States in 1986. *J. Natl. Cancer Inst.* **82**: 1402–1406, 1990.
- Hughes J.R., Gust S., and Pechacek T. Prevalence of tobacco dependence and withdrawal. *Am. J. Psychiatry* **144**: 205–208, 1988.
- Fiore M.C., Jorenby D.E., Schensky A.E., et al. Smoking status as the new vital sign: Effect on assessment and intervention in patients who smoke. *Mayo Clin. Proc.* **70**: 209–213, 1995.
- Fagerstrom K.-O. Measuring degree of physical dependence on tobacco smoking with reference to individualization of treatment. *Addict. Behav.* **3**: 235–241, 1978.
- Perkins K.A. Maintaining smoking abstinence after myocardial infarction. *J. Subst. Abuse* **1**: 91–107, 1988.
- Thorndike A.N., Rigotti N.A., Stafford R.S., and Singer D.E. National patterns in the treatment of smokers by physicians. *JAMA* **279**: 604–608, 1998.
- Saunders J.B., Aasland O.G., Babor T.F., et al. Development of the Alcohol Use Disorders Identification Test (AUDIT): WHO collaborative project on early detection of persons with harmful alcohol consumption-II. *Addiction* **88**: 791–804, 1993.
- Fleming M.F. and Barry K.L. A three-sample test of a masked alcohol screening questionnaire. *Alcohol Alcohol.* **26**: 81–91, 1991.
- Spitzer R.L., Williams J.B., Kroenke K., et al. Utility of a new procedure for diagnosing mental disorders in primary care: The PRIME-MD 1000 study. *JAMA* **272**: 1749–1756, 1994.
- Bernadt M.W., Mumford J., Taylor C., et al. Comparison of questionnaire and laboratory tests in the detection of excessive drinking and alcoholism. *Lancet* **1**: 325–328, 1982.
- Beresford T.P., Blow F.C., Hill E., et al. Comparison of CAGE questionnaire and computer-assisted labora-

- tory profiles in screening for covert alcoholism. *Lancet* **336**: 482–485, 1990.
22. Huseby N.E., Nilssen O., Erfurth A., et al. Carbohydrate-deficient transferrin and alcohol dependency: Variation in response to alcohol intake among different groups of patients. *Alcohol Exp. Clin. Res.* **21**: 201–205, 1997.
 23. Stauber R.E., Stepan V., Trauner M., et al. Evaluation of carbohydrate-deficient transferrin for detection of alcohol abuse in patients with liver dysfunction. *Alcohol Alcohol.* **30**: 171–176, 1995.
 24. National Institute on Alcohol Abuse and Alcoholism. *The physicians' guide to helping patients with alcohol problems*. NIH publication no. 95–3769. Washington, DC: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute on Alcohol Abuse and Alcoholism, 1995.
 25. Anderson P., Cremona A., Paton A., et al. The risk of alcohol. *Addiction* **88**: 1493–1508, 1993.
 26. Adams W.L., Barry K.L., and Fleming M.F. Screening for problem drinking in older primary care patients. *JAMA* **276**: 1964–1967, 1996.
 27. Ewing J. Detecting alcoholism: The CAGE questionnaire. *JAMA* **252**: 1905–1907, 1984.
 28. Buchsbaum D.G., Buchanan R.G., Centor R.M., et al. Screening for alcohol abuse using CAGE scores and likelihood ratios. *Ann. Intern. Med.* **115**: 774–777, 1991.
 29. Soderstrom C.A., Smith G.S., Kufera J.A., et al. The accuracy of the CAGE, the Brief Michigan Alcoholism Screening Test, and the Alcohol Use Disorders Identification Test in screening trauma center patients for alcoholism. *J. Trauma* **43**: 962–969, 1997.
 30. Townes P.N. and Harkley A.L. Alcohol screening practices of primary care physicians in eastern North Carolina. *Alcohol Alcohol.* **11**: 489–492, 1994.
 31. Allen J.P., Litten R.Z., Fertig J.B., and Babor T. A review of research on the Alcohol Use Disorders Identification Test (AUDIT). *Alcohol. Clin. Exp. Res.* **21**: 613–619, 1997.
 32. Barry K.L. and Fleming M.F. Alcohol Use Disorders Identification Test (AUDIT) and SMAST-13: Predictive validity in a rural clinical sample. *Alcohol Alcohol.* **28**: 33–42, 1993.
 33. Bohn M.J., Babor T.F., and Kranzler H.R. The Alcohol Use Disorders Identification Test (AUDIT): Validation of a screening instrument for use in medical settings. *J. Stud. Alcohol.* **56**: 423–432, 1996.
 34. Fleming M.F., Barry K.L., Baier Manwell L., et al. Brief physician advice for problem alcohol drinkers: A randomized controlled trial in community based primary care practices. *JAMA* **277**: 1039–1045, 1997.
 35. Edwards G., Orford J., Ehert S., et al. Alcoholism: A controlled trial of 'treatment' and 'advice.' *J. Stud. Alcohol.* **38**: 1004–1031, 1977.
 36. Chick J., Ritson B., Connaughton J., et al. Advice versus extended treatment for alcoholism: A controlled study. *Br. J. Addict.* **83**: 159–170, 1988.
 37. Miller W. and Sovereign R. The check-up: A model for early intervention in addictive behaviors. In: Loberg T., Miller W., Nathan P., and Marlatt G. (eds). *Addictive Behaviors: Prevention and Early Intervention*. Amsterdam: Swets & Zeitlinger, 1989. Pp. 219–231.
 38. Sanchez-Craig M. Brief didactic treatment for alcohol and drug-related problems: An approach based on client choice. *Br. J. Addict.* **85**: 169–177, 1990.
 39. Israel Y., Hollander O., Sanchez-Craig, et al. Screening for problem drinking and counseling by the primary care physician-nurse team. *Alcohol Clin. Exp. Res.* **20**: 1443–1450, 1996.
 40. Baer J.S., Kivlahan D.R., and Marlatt G.A. High risk drinking across the transition from high school to college. *Alcohol. Clin. Exp. Res.* **19**: 54–61, 1995.
 41. Bien T.H., Miller W.R., and Tonigan J.S. Brief interventions for alcohol problems: A review. *Addiction* **88**: 315–335, 1993.
 42. Wilk A.I., Jensen N.M., and Havighurst T.C. Meta-analysis of randomized control trials addressing brief interventions in heavy alcohol drinkers. *J. Gen. Int. Med.* **12**: 274–283, 1997.
 43. Cutler S.F., Wallace P.G., and Haines A.P. Assessing alcohol consumption in general practice patients—a comparison between questionnaire and interview (findings of the Medical Research Council's general practice research framework study on lifestyle and health). *Alcohol Alcohol.* **23**: 441–450, 1988.
 44. Burge S.K., Amodei N., Elkin B., et al. An evaluation of two primary care interventions for alcohol abuse among Mexican-American patients. *Addiction* **92**: 1705–1716, 1997.
 45. Wallace P., Cutler S., and Haines A. Randomised controlled trial of general practitioner intervention in patients with excessive alcohol consumptions. *BMJ* **297**: 663–668, 1988.
 46. Miller N. and Gold. Co-morbid cigarette and alcohol addiction: Epidemiology and treatment. *J. Addict. Dis.* **17**: 55–65, 1998.
 47. Manwell L.B., Fleming M.F., Johnson K., and Barry K.L. Tobacco, alcohol, and drug use in a primary care sample: 90-day prevalence and associated factors. *J. Addict. Dis.* **17**: 67–81, 1998.
 48. DiFranza J.R. and Guerra M.P. Alcoholism and smoking. *J. Stud. Alcohol* **51**: 130–136, 1990.
 49. Hughes J.R. Treatment of smoking cessation in persons with a past history of alcohol and drug problems. *J. Subst. Abuse Treat.* **10**: 181–187, 1993.
 50. Gulliver S.B. and Rohsenow D.J. Interrelationship of smoking and alcohol dependence and urges to use. *J. Stud. Alcohol* **202**: 206, 1995.
 51. Davis D.A., Thomson M.A., Oxman A.D., and Haynes R.B. Changing physician performance: A systematic review of the effect of continuing medical education strategies. *JAMA* **274**: 700–705, 1995.
 52. Schwartz J.S. and Cohen S.J. Changing physician behavior. In: *Agency for Health Care Policy Research Conference Proceedings*. 1990. Pp. 45–53.
 53. Soumerai S.B. and Avorn J. Principles of educational outreach (academic detailing) to improve clinical decision making. *JAMA* **263**: 549–556, 1990.
 54. Greco P.J. and Eisenberg J.M. Changing physicians' practices. Sounding board. *JAMA* **329**: 1271–1274, 1993.

55. Eisenberg J.M. and Williams S.V. Cost containment and changing physicians' practice behavior: Can the fox learn to guard the chicken coop? *JAMA* **246**: 2195–2201, 1981.
56. Bowers D.G. and Franklin J.L. *Survey-guided development I: Data-based organizational change*, rev. ed. La Jolla, CA: University Associates, 1977.
57. National Committee for Quality Assurance (1997). *Quality compass, 1997*. Washington, DC: National Committee for Quality Assurance, 1997.
58. Cromwell J., Bartosch W.J., Fiore M.C., et al. Cost-effectiveness of the clinical practice recommendations of the AHCPR Guideline for Smoking Cessation. *JAMA* **278**: 1759–1766, 1997.
59. Center for Substance Abuse Prevention (CSAP). *A guide to substance abuse services for primary care clinicians: Treatment improvement protocol*. Fleming M. and Sullivan E. (eds). TIP series no. 24. U.S. Department of Health and Human Services publication no. SMA 97–3137. Rockville, MD: U.S. Department of Health and Human Services, 1997.
60. Fleming M.F., Mundt M., French M., and Barry K. A benefit-cost analysis of brief physician advice with problem drinkers in primary care settings. *JAMA*. In review.