PREVENTIVE MEDICINE **25,** 346–354 (1996)
ARTICLE NO. 0065

Reaching Midlife and Older Smokers: Tailored Interventions for Routine Medical Care[1]

GLEN D. MORGAN, PH.D.,*,[2] ELIZABETH L. NOLL, B.A.,† C. TRACY ORLEANS, PH.D.,† BARBARA K. RIMER, DR.P.H.,‡ KWEKU AMFOH, M.PHIL,† AND GEORGE BONNEY, PH.D.†

**Wyoming Valley Family Practice Residency, Kingston, Pennsylvania 18704; †Fox Chase Cancer Center, Philadelphia, Pennsylvania 19111; and ‡Duke University, Durham, North Carolina 27708*

Background. **Although older adults can achieve significant health benefits from smoking cessation, few programs have specifically targeted this population. This study tested the effectiveness of an office-based smoking cessation program tailored to midlife and older smokers.**

Methods. **This paper describes a randomized controlled trial comparing usual care with physician-delivered brief quit-smoking advice and counseling for midlife and older smokers (ages 50–74). Outpatient medical practices assigned to the Immediate Intervention (experimental) condition were trained to deliver brief quit-smoking advice and counseling. Delayed Intervention (control) practices followed usual care procedures. Thirty-nine practices accruing five or more patients per practice were included in the analyses.**

Results. **Using a conservative measure of quitting, self-reported quit rates at 6-month follow-up were 15.41% for the Immediate Intervention group versus 8.16% of subjects in the Delayed Intervention group ($P < 0.005$). Baseline subject ($N = 659$) characteristics related to 6-month abstinence included number of previous quit attempts, quitting for 24 hr in the past year, desire to quit, confidence in quitting, perceived health benefits, and lower nicotine dependence.**

Conclusions. **Smoking abstinence was significantly increased by training physicians and key office and clinical staff to intervene with older smokers. Brief interventions tailored to this age cohort can be successfully and efficaciously integrated into routine care.**

Key Words: **older adults; smoking cessation; office-based intervention.**

INTRODUCTION

Today's older smoker came of age in an era when smoking was considered glamorous, safe, and good for mood and weight control. Even physicians once endorsed the medical and psychological benefits of smoking. The legacy is generations of long-term, heavy smokers. Individuals 50 years and older constitute the fastest growing age cohort in the United States, representing 1 in 4 Americans.[1] Over 12 million American smokers have now passed their 50th birthday.[2] Smoking remains a significant health hazard for the U.S. aging population. Smoking doubles mortality rates for people 65 and older[3] and is a major risk factor in 6 of the top 14 causes of death.[4] Smoking complicates a number of illnesses common among older people, including heart disease, high blood pressure, circulatory and vascular conditions, duodenal ulcers, osteoporosis, and diabetes,[5–8] and impairs the effectiveness of many medications prescribed to treat those chronic conditions.[9]

Substantial benefits accrue from smoking cessation even after 20, 30, or 40 years of tobacco addiction. Cessation of smoking extends years of life and years of active life by preventing or reducing the impact of acute and chronic illnesses that limit independence.[10] As reviewed by Rimer et al.,[10] the benefits of cessation are almost immediate for many conditions, such as heart disease and stroke (e.g., Heramnson et al.,[11] Howard et al.[12]). Although the benefits of cessation on respiratory function occur over a longer period of time, even symptomatic patients show improvements in lung function when they stop smoking.[13,14] The 1990 Surgeon General's Report[15] concluded that smoking cessation is beneficial at any age. For these reasons, older Americans have been declared an important target for national tobacco control initiatives.[16,17]

Although it is now clear that smokers of all ages benefit from quitting, older adults have been virtually ignored. Most smoking cessation programs have not addressed the special needs of older smokers.[10] One of the exceptions is Hill et al.,[18] who randomized 82 smokers, age 50 and over to four conditions, three behavioral and placebo control (exercise). Though the 12-

Portions of this paper were presented at the Society of Behavioral Medicine Annual Meeting, Boston, 1994.

[1] Research supported by NCI Grant CA34856 and NIH Grant 1R01HL50489.

[2] To whom correspondence and reprint requests should be addressed at Wyoming Valley Family Practice Residency, 540 Pierce St., Kingston, PA 18704

0091-7435/96 $18.00

month follow-up abstinence rates for the behavioral conditions were nearly three times that of the exercise condition, group differences failed to achieve statistical significance. There was a significant difference, however, between the exercise group and aggregated data from the three other conditions, favoring the latter.

Though the study of Hill et al.[18] suggests the utility of behaviorally oriented group approaches for older smokers, most smokers do not attend formal cessation programs.[19,20] Smoking interventions by physicians provide the opportunity to personalize smoking cessation messages while reaching significant numbers of smokers.[21] Seventy-seven percent of smokers 50 and older see a physician at least once a year.[22] The average smoker visits a physician 4.3 times each year.[23] Each visit offers an opportunity to provide smoking cessation advice and counseling. Among smokers planning to quit, those over age 50 are more likely than those younger to plan to quit within the next 3 months.[24]

There are many studies demonstrating increased cessation rates as a consequence of physicians' brief advice or counseling,[25–28] but only one was specifically directed toward older smokers. Vetter and Ford[29] evaluated the impact of direct advice from a physician combined with nurse assistance on smoking cessation in 471 smokers age 60 years and over. Subjects randomized to the intervention condition were invited, by letter, to visit their general practitioner on a nonurgent matter. The physician then informed the patient of the importance of stopping smoking. This was followed by the nurse offering advice on lifestyle modification, with special attention given to smoking. A standard behavioral intervention was not introduced. Six-month abstinence status, verified by expired air carbon monoxide, was statistically higher for the intervention group (14% versus 9%). Though demonstrating the impact of medical advice, this intervention was not delivered in the context of a regular health care visit.

The following study tested the effectiveness of a smoking cessation intervention designed to address the quitting concerns and the smoking patterns of older smokers. This study expands past research by utilizing an approach both specifically tailored to older smokers and integrated into routine care. We hypothesized that a cessation guide that addressed the known barriers, concerns, and motivations for quitting among older smokers would be superior to a generic guide.[30] Most existing print materials have not focused on the special needs of older smokers or included them prominently in photos or graphics. Thus, tailoring included attention to the graphic and style preferences of older adults as well as inclusion of content specific to older smokers, especially the benefits of quitting at any age. An earlier phase of the study was conducted in the community and demonstrated the superiority of the tailored guide over a generic smoking cessation guide. See Rimer et al.[30] for a description of the developmental process for the *Clear Horizons* guide.

METHODS

Study Population

Medical practices. Primary care practices were recruited to participate in a 2-year randomized controlled trial comparing usual care with brief quit-smoking advice and counseling for midlife and older smokers (ages 50–74). Recruitment occurred from February 1991 through February 1992 in suburban Philadelphia and eastern Pennsylvania. Criteria for participation were willingness to participate in a brief office-based training program, absence of a formalized smoking intervention program, and provider projections of ability to accrue 25 age-eligible patients within 3 months. The 81 practices that initially expressed interest in the project were interviewed by phone regarding project guidelines and eligibility criteria. Of these, 49 practices met criteria and agreed to participate in the study. They were recruited by mailings to physicians participating in an HMO ($N = 23$), advertising in regional and state medical society journals ($N = 1$), and contacting practices identified by the investigators ($N = 25$).

Entire practices (physicians and key nonphysician office staff) were randomized to Immediate Intervention ($N = 23$) or Delayed Intervention ($N = 26$) conditions. The authors used several strategies to facilitate provider adherence to research and intervention protocols (e.g., patient enrollment aids, cues and reminders for office staff, practical intervention aids, regular staff contacts, and small gifts). Patient accrual proved more difficult than expected due to the selective nature of enrollment (not every smoker, but every smoker age 50–74) and provider overestimates of the number of older smokers in their practices. Practices ranged from 5 to 50 weeks (36 week average) for patient accrual. Based on original estimates of effect size and expected variance among practices, a minimum number of five patients required per practice was calculated using power contour plots.[31] Thus, practices that accrued fewer than five patients were excluded in order to allow for sufficient power to detect hypothesized differences in quit rates. This left 18 Immediate Intervention (experimental) and 21 Delayed Intervention (control) practices. Specialties included family medicine ($N = 20$), internal medicine ($N = 17$), cardiology ($N = 1$), and ob/gyn ($N = 1$). There were no differences in specialty across conditions.

Patient eligibility. Participants were eligible if they were between the ages of 50 and 74, were seeing the physician for a noncrisis visit, and were smokers. Status as a smoker was defined as having had a cigarette in the previous 7 days.[32] Subjects were assured that they did not have to quit smoking, or even try, to par-

ticipate in the project. The purpose of this aspect of eligibility was to help ensure that the trial included all eligible smokers and not just motivated smokers. All patients meeting the above criteria completed a questionnaire about smoking habits and provided informed consent prior to seeing a health care provider. These requirements and procedures were implemented equivalently across the two conditions.

Provider Training

The training program was designed for brief office-based presentation using the principles of pharmaceutical and academic detailing.[33] Physicians and key office and clinical staff in both Immediate and Delayed Intervention conditions were provided 45- to 60-min on-site training by masters- or doctoral-level psychologists and health educators. Training included a presentation of background and rationale for the project including the special needs of older smokers, training objectives, goals for the practice, and data collection guidelines. Continuing education credit for physicians and nurses was provided. Each practice was required to identify a coordinator to interface with the project staff. Delayed Intervention practices were instructed to provide usual care to their older smokers over the accrual and follow-up period.

Practices in the Immediate Intervention condition received on-site training to implement a modified National Cancer Institute (NCI) smoking cessation intervention. The NCI program was derived from the experience of five physician-based smoking cessation intervention trials involving over 4,000 smokers.[34] The intervention protocol comprises four steps: *Ask* about smoking at every opportunity, *Advise* all smokers to stop, *Assist* the patient to stop smoking, and *Arrange* for follow-up support.[35]

Immediate Intervention physicians were trained to praise patients for previous quit efforts, provide personalized feedback linking smoking to symptoms, discuss the health benefits of quitting for older smokers, and give a clear message to stop smoking. Patients were given a copy of a smoking cessation guide tailored to older smokers (*Clear Horizons*) and asked, "If we give you some help, are you willing to try to quit?" Smokers in the precontemplation stage, who declined help, received brief guide-based counseling to overcome quitting barriers. Smokers in the contemplation stage received brief guide-based counseling to set up a quit plan and quit date and, when indicated, a prescription for nicotine gum (nicotine patches were not available at this time). Free 1-week samples of nicotine gum were given in these circumstances. All smokers were to be sent a follow-up letter drafted by the Clear Horizons office from their physician within 1 week of their visit. Smokers received a brief follow-up Clear Horizons Quitline counseling call from project staff within 2–4 weeks of the intervention visit to reinforce their efforts, explore barriers, and discuss their quit plans.

Materials

Treatment guide. The *Clear Horizons* guide[36] is the first self-help smoking program designed especially for long-term, heavy smokers, age 50 and older.[30] Modeled after the AARP magazine *Modern Maturity,* it is written at the 8th-grade reading level and introduces effective quit-smoking strategies using examples of smokers in their 50s, 60s, and 70s. The guide was designed to address individuals at all stages of smoking and is divided into several sections: deciding to quit, preparation, initial cessation, and maintenance. It provides explicit information about the health consequences of continued smoking and the health benefits of quitting for older long-term smokers. The guide was pretested extensively with older adults and was found to be useful, interesting, and understandable. In the community trial, *Clear Horizons* proved more appealing and effective than a generic guide and was significantly more helpful in motivating smoking cessation.[30]

Medical record flowchart. The authors developed a flowchart medical record form, "Helping Your Patient Stop Smoking," that provided intervention guidelines, served as a prompt data record for the practice and investigators, facilitated a team approach, and enabled intervention practices to follow the NCI protocol step by step (Fig. 1). The form referenced key smoking history questions, presented guidelines for reviewing the *Clear Horizons* guide, and suggested phrasing for counseling patients about their smoking. The form was designed to streamline intervention and research protocols so they could be easily integrated into routine primary care.

Data Collection

Physicians completed a questionnaire following the close of enrollment regarding perceptions of their effectiveness giving quitting advice, and the program's effectiveness and feasibility. Patients in the Immediate Intervention were telephoned by program staff between 2 and 4 weeks after their office visit for brief follow-up counseling and to check on provider adherence to the treatment protocol. Follow-up telephone interviews were conducted by professional interviewers 6 months after enrollment.

Statistical Analysis

Descriptive statistics were computed for all baseline and follow-up measures. To identify covariates of selected process and outcome measures, bivariate comparisons were conducted using χ^2 tests for categorical variables, Mantel–Haenszel χ^2 analysis for ordinal variables, and t tests for continuous variables. For this

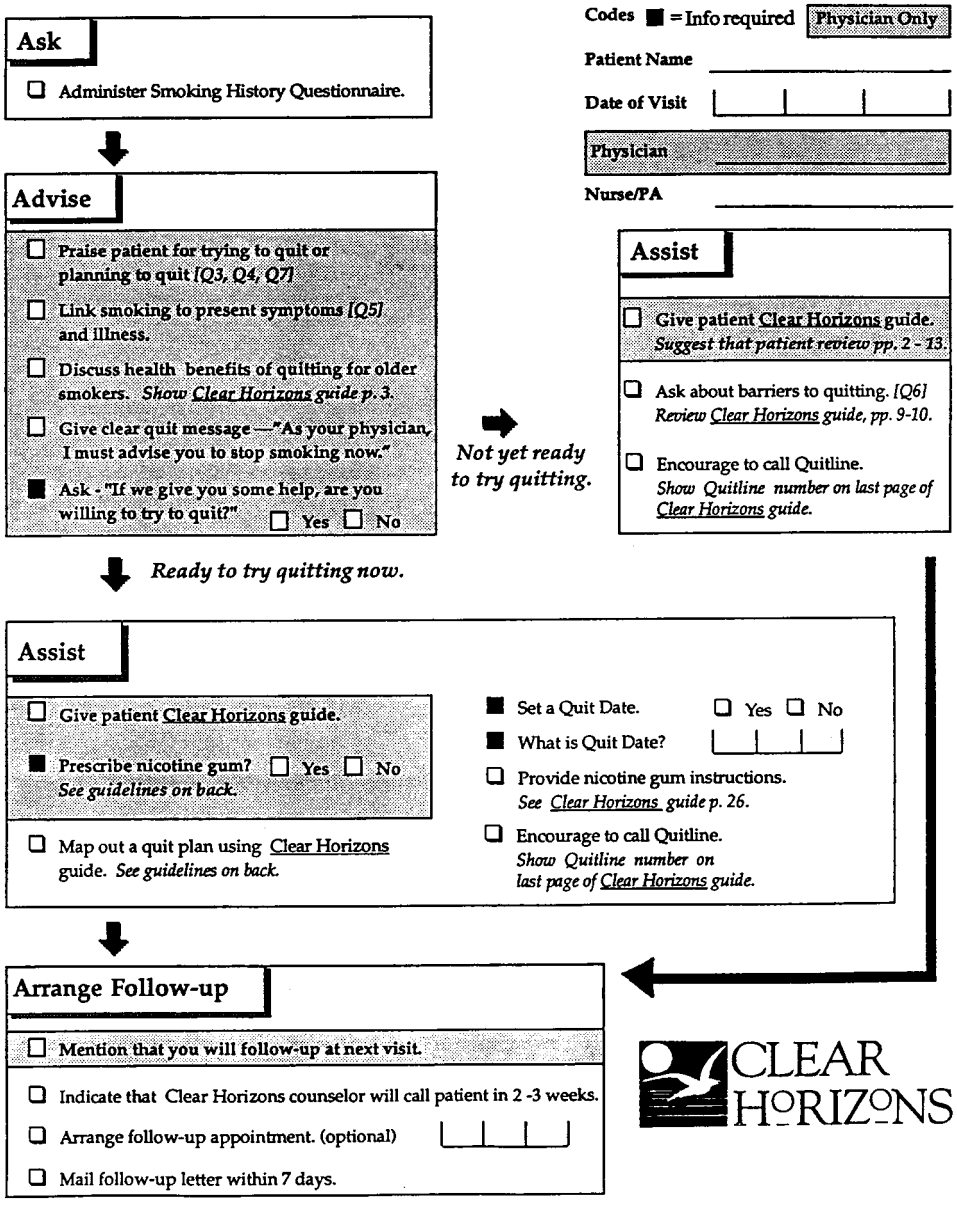

FIG. 1. "Helping Your Patients Stop Smoking."

group-randomized intervention trial, standard logistic regression models were computed for each condition as well as a combined model. Since the physician practice group was the unit of randomization, respondents within a given practice may have correlated outcomes that may be influenced by group (physician practice) variables and individual respondent (patient) variables. Therefore, a correlated logistic regression model that accounts for dependencies among respondents within a given practice was also utilized. This correlated model was originally developed to account for dependencies among household or family members.[37,38] The dependencies are measured on the log–odds scale as in standard logistic regression. Thus, the model includes the parameters of the standard logistic regression and two other parameters describing dependencies within control groups and within intervention groups. Results from this analysis are summarized separately for the standard logistic and correlated models in Table 3.

RESULTS

Baseline Patient Profile

Baseline demographic and smoking characteristics for all participants ($N = 659$) are presented in Table 1. The sample population was 56% female, had an average age of 60.1 years, and smoked about 20 cigarettes per day ($M = 20.1$, SD = 12.1). Over three-quarters of

TABLE 1
Baseline Characteristics by Study Group

	P value	Immediate (n = 279)	Delayed (n = 380)	Overall (n = 659)
Demographics				
Mean age	**	60.9	59.5	60.1
Sex (% female)	NS	54.5	57.6	56.3
Smoking-related behaviors				
Mean no. cigarettes smoked per day	*	19.0	20.9	20.1
Mean number of years smoked	*	43.0	41.6	42.1
% smoke within 30 min of waking	**	72.3	81.1	77.4
% quit ≥24 hr. in last 12 months	NS	50.4	49.2	49.7
% seriously thinking about quitting within the next year	*	88.0	82.3	84.7

Note. Tests: χ^2 test (categorical variables), Mantel–Haenszel χ^2 (ordinal variables), and t tests (interval variables). NS, not significant.
* $0.01 < P < 0.05$.
** $0.001 < P < 0.01$.
*** $P < 0.001$.

the participants reported smoking their first cigarette within 30 min of awakening, an indicator of high nicotine dependence.

Immediate and Delayed Intervention practices did not differ significantly in the mean number of patients enrolled, gender of patients enrolled, or reporting of quit attempts lasting 24 hr or more in the previous year. However, as shown in Table 1, patients in the two conditions did differ in age, average number of cigarettes smoked daily, time elapsed until first cigarette of the morning, and contemplation status. Smokers in the Delayed Intervention practices were slightly younger (59.5 years versus 60.9 years), reported slightly higher average daily cigarettes (20.9 cigarettes versus 19.0 cigarettes), more often reported smoking within 30 min of awakening (81% versus 72%), and were less likely to be contemplating or planning to quit within 6 months (82% versus 88%).

Practices

Provider adherence. As a check on provider adherence to the recommended treatment protocol, Immediate Intervention patients contacted for the follow-up counseling call were asked about eight specific physician activities. As Fig. 1 outlines, three of these activities were recommended for *all* patients, regardless of their stage of change (physician quitting message, delivery of *Clear Horizons* guide, mailing of a follow-up letter). The remaining activities were optional—based on the patient's stage of change and the appropriateness of nicotine gum. As Table 2 shows, relatively high levels of compliance were achieved for the first two required intervention steps: 88% of patients reported getting clear physician quitting advice since enrollment and 95% reported receiving the *Clear Horizons* guide. Only 35%, however, reported having received a smoking follow-up letter. Preprinted follow-up letters (provided by the research team) were to be mailed to all intervention patients 7 days after the index visit. It is possible that some patients, interviewed 2 to 4 weeks after enrollment, had not yet received their letters. It is also conceivable that the mailing occurred but was delayed beyond our follow-up interview window. On the other hand, it may be that the office-based system of reminders and prompts required to accomplish this mailing proved overly burdensome for these practices. The additional optional counseling steps noted in Table 2 were reported by 37–45% of patients. Nicotine gum prescription and sampling were reported by about 31% of patients.

Physicians apparently continued to address smoking with their older patients following the initial interven-

TABLE 2
Patient Reports of Interaction with Physician at 2- to 4-Week Follow-Up, Immediate Intervention Only (N = 259)

	% yes
Doctor recommended that you stop smoking	88.4
Doctor gave you *Clear Horizons* guide	95.8
Received a letter about quitting plans from doctor since visit	35.1
Someone talked to you about quitting methods in the guide (optional)	44.8
Set a quit date (optional)	37.1
Doctor prescribed nicotine gum (optional)	30.9
Doctor gave sample of nicotine gum (optional)	31.7
Doctor asked you to set another appointment to talk about quitting (optional)	38.6

tion. At the 6-month follow-up, 358 (64%) participants reported that they had talked with their doctor about smoking since the initial visit. There were significant differences between Immediate and Delayed practices with respect to receiving advice to quit and discussions regarding smoking, setting a quit date and nicotine gum use (see Fig. 2).

All primary care providers were surveyed by telephone shortly after the close of the enrollment period to assess the feasibility and perceived efficacy of the intervention. The results are based on completed interviews (14 of the 18 Immediate Intervention practices). Most (79%) of the physicians in the Immediate Intervention practices reported spending between 3 and 10 min per patient implementing the counseling intervention. While 43% thought that their older smoking patients were often or always receptive to their advice to quit, physicians in this group were sometimes influenced not to counsel these patients by the fact that their older patients often have other acute health problems requiring attention (50%) or by the perception that compliance with medical quitting advice was unlikely (50%).

Provider perceptions of protocol. In general, providers rated the protocol to be practical and helpful. The most highly rated features of the intervention reported by the 14 primary physicians from the Immediate Intervention practices surveyed were the counseling call and the *Clear Horizons* guide (78.5%). Half found having a supply of nicotine gum proved helpful, while 46% highly rated the reinforcing letter. The overwhelming majority of these physicians (93%) expressed increased confidence in counseling their older patients to stop smoking since participating in the intervention. Ninety-two percent said their patients reacted very favorably to the Clear Horizons counseling and materials, and 86% planned to continue using the basic Clear Horizons approach with their older smoking patients. The most often-reported barrier identified by the intervention physicians surveyed was the patient's perceived lack of interest in quitting (43%).

Smoking Cessation

Of the 659 patients who completed the baseline questionnaire, 573 (87%) were contacted for a telephone interview at the 6-month follow-up. Participants were classified as abstinent if they reported not having smoked a cigarette in the previous 7 days.[32] Self-reported quit rates for respondents on the 6-month survey ($N = 573$) were 17.8% for the treatment group compared with 9.3% for the control group ($P < 0.005$). Counting all nonrespondents as smokers ($N = 659$), the quit rates were 15.4% for the Immediate Intervention and 8.2% for the Delayed Intervention ($P < 0.005$) (Fig. 2). Either way, quit rates were doubled for participants in the Immediate Intervention group. Six-month abstinence rates did not differ among Immediate Intervention participants based on their receiving a prescription for nicotine gum (19% versus 18%).

The regression models summarized in Table 3 confirm the intervention effect reported above. There is virtually no correlation within practices assigned to

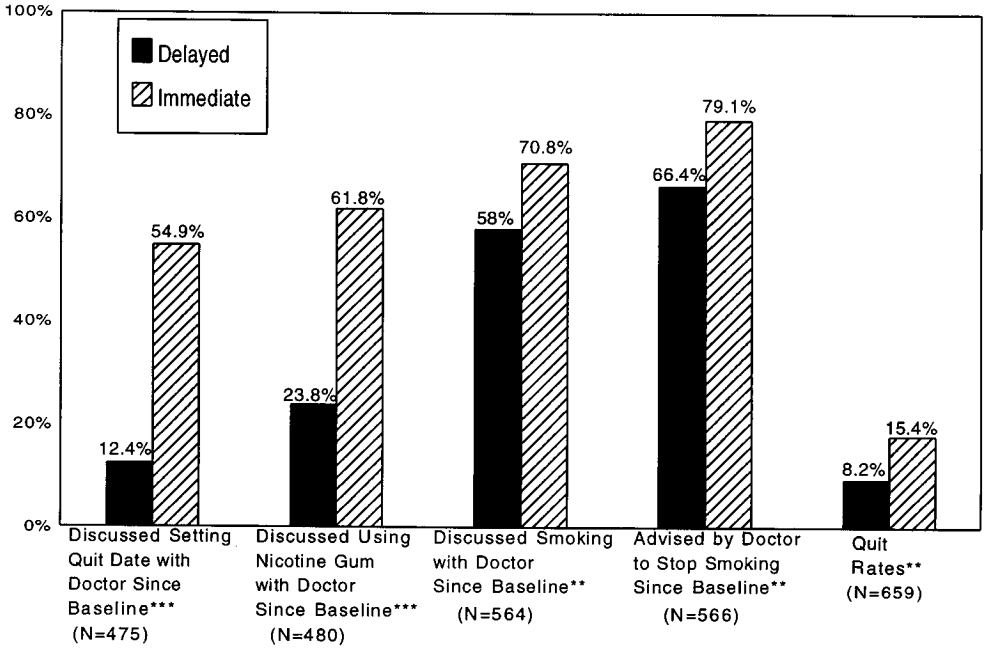

FIG. 2. Patient report of physician interaction and quit rates at 6-month follow-up by study group. *N*s differ due to missing data. **, $0.001 < P < 0.01$; ***, $P < 0.001$.

TABLE 3
Estimates and Standard Errors from Regression Analyses: 6-Month Quit Status

Variable	Standard logistic regression model			Correlated logistic regression model
	Intervention	Controls	Combined	
Patient characteristics				
Age	−1.1596 ± 1.3195	−1.3825 ± 1.3195	−1.2655 ± 0.8613	−1.0739 ± 0.8621
Number of quitting techniques	0.1850 ± 0.1090	0.1417 ± 0.1606	0.1784 ± 0.0894*	0.3392 ± 0.1077*
Confidence in quitting for good	0.2148 ± 0.1396	0.4332 ± 0.1628*	0.3128 ± 0.1057*	0.2823 ± 0.0934*
Practice characteristics				
Constant	−2.3200 ± 0.3864*	−3.4659 ± 0.4772*	−3.1730 ± 0.3314*	−2.9787 ± 0.2727*
Intervention	—	—	0.6263 ± 0.2644*	0.8628 ± 0.1374*
Group Size	−0.2786 ± 0.1854	−0.1658 ± 0.2005	−0.2216 ± 0.1373	−0.1182 ± 0.0913
Dependence				
Within control	—	—	—	0.0875 ± 0.1182
Within intervention	—	—	—	−1.006 ± 0.2706*

Note. χ^2 for comparing the standard (combined) and the correlated model is 16.689 with 2 degrees of freedom ($P < 0.001$).
* Significant at the 5% level.

controls, but a significant negative correlation within intervention groups was found. The negative estimate reflects substantial heterogeneity among subjects assigned to the treatment groups. Despite this variation among subjects, the treatment effect remained significant. A χ^2 test comparing the correlated model with the standard logistic model was significant ($P < 0.001$). Thus, the correlated model provided a better portrayal of practice-related differences while controlling for within-practice correlation. Of the practice-related variables explored in both models (e.g., physician specialty, practice location, practice size), group size was nearly significant ($P = 0.054$) in the combined logistic regression. This, combined with the negative within-intervention dependence in the correlated model, suggests that practice effectiveness deteriorates as more patients are accrued.

With respect to the respondents' individual dispositional variables, confidence in the ability to quit for good ($P < 0.05$) and number of quitting techniques ($P < 0.05$) remained after a backward selection procedure using the combined models. Number of quitting techniques has a positive impact on quitting rates but it is significant only when the intervention and control groups were pooled together (combined and correlated models). Confidence in quitting for good also has a positive impact on quitting rates but is not significant in the intervention group model. Thus, in the absence of the intervention, confidence in one's ability to quit for good is the most important individual characteristic variable.

DISCUSSION

Six-month abstinence rates were nearly doubled by training physicians and staff to deliver a smoking cessation intervention tailored to midlife and older adults. This office-based intervention included a tested, well-designed tailored manual, a flow chart to facilitate and cue intervention, and follow-up by project staff. Practices utilized a team approach and integrated smoking cessation treatments into routine care. Physician training was effective, judging by high provider adherence levels reported by patients and based on favorable physician ratings. The majority of intervention group physicians continued to address smoking and cessation with patients during the 6 months following the initial visit, further suggesting the intervention was well integrated with routine care.

The cessation and abstinence rates achieved in this study compare favorably with those of other physician-initiated, minimal-contact interventions. While several studies demonstrated no differences at 12-month follow-up,[39,40] Ockene and colleagues[27] found that training medical residents in smoking interventions achieved a 17.4% abstinence rate with patients at 6-month follow-up, compared with 9.1% for usual care. Wilson et al.[41] found a combination of counseling plus nicotine polacrilex superior to usual care (8.8% versus 4.4%, 3-month sustained abstinence) at 12-month follow-up.

Moreover, our results were attained through a single brief training protocol based on pharmaceutical/academic detailing methods.[33] Past studies generally included scheduling at least one follow-up visit with patients. In the current study, physicians were "encouraged" to follow-up with patients: 70.8% of the patients discussed smoking and 54.9% discussed setting a quit date with their physician since the initial visit.

Some important baseline variables distinguished those who quit from those who did not. Providers should be aware that for older as well as younger smokers, thinking about quitting is a powerful predictor of cessation. Also, older smokers who were more addicted were less likely to quit. This suggests, perhaps, the

need for more aggressive pharmacologic therapy. Setting a date, feeling confident, and wanting to quit also were very significantly related to quitting. These relationships suggest some concrete provider interventions. If providers could do just one thing, it might be to encourage their patients to set quit dates, a concrete commitment, and first step to quitting.

Practices varied among and between conditions in numbers of patients accrued and rate of accrual. Immediate and Delayed treatment groups also differed on several baseline variables that the literature and present analyses showed to be associated with abstinence from smoking. These differences raise the concern that physicians in the experimental group may have been selecting patients who appeared to be better candidates for intervention based on symptoms or perceived motivation. Though the limited sample size within groups prevents post hoc analyses, regression modeling procedures were performed to adjust for the potentially confounding effects of these group differences.

Intriguing findings on the relationship between number of patients accrued into the intervention arm and treatment outcomes suggest that in busy primary care practices, the quality and impact of a brief smoking intervention may be diminished when a greater number of patients are accrued. Although each patient intervention took only minutes to deliver, the more patients seen, the greater the cumulative demand on practices' resources. These results imply that practices will need office systems to simplify the identification and treatment of smokers if they are to approach the ideal of intervening with every patient seen, as recommended in NCI guidelines.[35]

Though a conservative estimate of smoking status was used (nonresponders were counted as smokers), the logistics of conducting a community-based intervention precluded biochemical verification of smoking status. This, of course, is a limitation of the study. However, Velicer et al.[42] project false report rates of only 5–10% in minimal contact studies such as this one.

Organizational factors had an important influence upon practices' participation in the study. Practices were recruited by targeting physicians, but ancillary staff (nurses, practice coordinators) played a central role in the intervention, data collection, and communication with project staff. When the commitment was not shared among staff, accrual faltered. An extreme, but not unusual, example were staff members who passively subverted the intervention. Anecdotal evidence reflected that this might occur when staff members smoked or when they felt already overburdened with other responsibilities. The most successful practices appeared to have top-down commitment and a strong practice/office coordinator. Initial exploration of some of these variables by recent research has provided interesting evidence that smoking cessation counseling differed according to provider type.[43]

An important area for future inquiry is the systematic identification and evaluation of organizational factors as well as physician and staff attributes that affect either participant recruitment or interventions. We also believe the study of tailored interventions for older smokers should be expanded to address other patient factors, including the extent of smoking-related disease, presence of negative affect, and the effect of hospitalization.[21]

The interventions used in this study should be disseminated through a variety of settings and channels. Thousands of physicians already have been trained to use the Ask, Advise, Assist, and Arrange Follow-up Model developed through NCI-funded research.[35] The model can be adapted readily to include messages specific to older smokers. The NCI's Cancer Information Service (1-800-4-CANCER) has trained its information specialists to provide special counseling for older smokers. Similarly, the AARP, with Fox Chase Cancer Center, developed a special training program about the benefits of quitting for older smokers. Although the proactive call may be more difficult to implement in many settings, distribution of the *Clear Horizons* guide would be well within the means of most providers. Computer-based systems that can prompt providers and generate patient-tailored educational materials also hold great promise.

This is the first study to evaluate smoking interventions tailored to midlife and older smokers integrated into routine primary medical care. This study supports many others in showing the benefit of brief physician counseling. Older smokers appear to benefit no less than their younger counterparts from brief office-based quit-smoking counseling. Providers are likely to comply when intervention requirements are minimal. We believe that it is useful not only to involve multiple providers, but to be cognizant of organizational factors and to utilize a true team approach when there is consistent commitment among providers and staff. As the population ages, it will become increasingly important to weave tailored approaches into practice as an integral part of preventive medical care.

REFERENCES

1. Orleans CT, Rimer BR, Cristinzio S. A national survey of older smokers: treatment needs of a growing population. Health Psychol 1991;10:343–51.
2. Office on Smoking and Health. Smoking and older Americans: communication strategies background paper. Washington: Public Health Service, 1989.
3. LaCroix AZ, Lang J, Scherr P, Wallace RB, Cornoni-Huntley J, Berkman L, et al. Smoking and mortality among older men and women in three communities. N Engl J Med 1991;324:1619–25.
4. Special Committee on Aging, United States Senate. Developments in aging, 1986. 3, Washington: USGPO, 1987;Vol. 3:10.
5. Achkar E. Peptic ulcer disease: current management in the elderly. Geriatics 1985;40:77–9, 82–3.
6. Somerville K, Faulkner G, Langman M. Non-steroidal anti-

inflammatory drugs and bleeding peptic ulcer. Lancet 1986; 1:462–4.

7. Moore SR. Smoking and drug effects in geriatic patients. Pharm Int 1986;7:1–3.
8. Mellstrom D, Rundgren A, Jagenburg R, Steen B, Svanborg A. Tobacco smoking, aging and health among the elderly: a longitudinal population study of 70 year old men and an age cohort comparison. Age Aging 1982;11:45–58.
9. Rimer BK, Orleans CT, Cristinzio S, Keintz MK, Fleisher L. A national survey of older smokers: treatment needs of a growing population. Health Psychol 1991;10(5):343–51.
10. Rimer BK, Orleans CT, Keintz MK, Cristinzio S, Fleisher L. The older smoker: status, challenges and opportunities for intervention. Chest 1990;97:547–53.
11. Heramnson B, Omenn GS, Kronmal RA, Gersh BJ, and participants in the Coronary Artery Surgery Study. Beneficial six-year outcome of smoking cessation in older men and women with coronary artery disease. N Engl J Med 1988;319:1365–9.
12. Howard G, Toole JF, Frye-Pierson J. Factors influencing the survival of 451 transient ischemic attack patients. Stroke 1987;18:552–7.
13. Lubin YH, Blot WJ, Berrino F, Flamant R, Gillis CR, Dunze M, et al. Modifying risk of developing lung cancer by changing habits of cigarette smoking. Br Med J 1984;288:1953–6.
14. Pathak DR, Samet JM, Humble CG, Skipper BJ. Determinents of lung cancer risk in cigarette smokers in New Mexico. J Natl Cancer Inst 1986;76:597–604.
15. U.S. Department of Health and Human Services. The health benefits of smoking cessation: a report of the Surgeon General (DHHS). Washington: U.S. Gov. Printing Office, 1990; Publication No. (CDC) 90:8416.
16. U.S. Department of Health and Human Services. Proceedings of the Surgeon General's workshop on health promotion and aging (Smoking Cessation Working Group). Washington: U.S. Govt. Printing Office, 1988.
17. U.S. Department of Health and Human Services. Smoking and health: a national status report (DHHS). Washington: U.S. Govt. Printing Office, 1990; Publication No. (CDC) 87:8396.
18. Hill R, Rigdon M, Johnson S. Behavioral smoking cessation treatment for older chronic smokers. Behav Ther 1993;24:321–9.
19. Gallup G. Public puffs on after 10 years of warnings. In: Gallup Opinion Index. Princeton (NJ). Gallup Organization, 1974; Rep. No. 108:20–1.
20. Fiore MC, Novotny TE, Pierce JP, Giovino GA, Hatziandrea EJ, Newcomb PA, et al. Methods used to quit smoking in the United States. Am Med Assoc 1990;263:2760–5.
21. Lichtenstein E, Glasgow RE. Smoking cessation: what have we learned over the past decade? J Consul Clin Psychol 1992;60: 518–27.
22. Rimer BK, Orleans CT. The family physician's role in helping older smokers quit. Am Fam Physician 1990;42:959–66.
23. Prochaska JO, DiClemente CC. Stages and processes of self-change of smoking: toward an integrative model. J Consul Clin Psychol 1983;51:390–5.
24. Kviz FJ, Clark MA, Crittenden KS, Freels S, Warnecke RB. Age and readiness to quit smoking. Prev Med 1994;23:211–22.
25. Fisher EB Jr, Haire-Joshu D, Morgan GD, Rehberg H, Rost K. State-of-the-art review: smoking and smoking cessation. Am Rev Resp Dis 1990;142:702–20.
26. Orleans CT, Glynn TJ, Manley M, Slade J. Minimal-contact quit smoking strategies for medical settings. In: Orleans CT, Slade J, editors. Nicotine addiction: Principles and management. New York: Oxford Univ. Press, 1993.
27. Ockene JK, Kristeller J, Goldberg R, Amick TL, Pekow PS, Hosmer D, et al. Increasing the efficacy of physician-delivered smoking interventions: a randomized clinical trial. J Gen Intern Med 1991;6:1–8.
28. U.S. Department of Health and Human Services. Tobacco and the clinician: interventions for medical and dental practice (DHHS). Washington: U.S. Gov Printing Office, 1994; Publication No. 94:3693.
29. Vetter NJ, Ford D. Smoking prevention among people aged 60 and over: a randomized controlled trail. Age Aging 1990;19: 164–8.
30. Rimer BK, Orleans CT, Fleisher L, Cristinzio S, Resch N, Telepchak M, Keintz MK. Does tailoring matter? The impact of a tailored guide on ratings and short-term smoking-related outcomes for older smokers. Health Educ Res 1994;9:69–84.
31. Hsieh FY. Sample size formulae for intervention studies with the cluster as unit of randomization. Stat Med 1988;8:1195–201.
32. National Cancer Institute. Smoking tobacco and cancer program: 1985 report. Bethesda (MD), 1986; NIH Publication No. 86–2687.
33. Soumerai S, Avorn J. Principles of educational outreach ("academic detailing") to improve clinical decision making. J Am Med Assoc 1990;263:549–56.
34. Glynn TJ, Manley MW. Physicians, cancer control and the treatment of nicotine dependence: defining success. Health Educ Res 1989;4:479–87.
35. Glynn TJ, Manley MW. How to help your patients stop smoking: a national cancer institute manual for physicians. Washington: USDHHS, 1989; NIH Publication No. 89:3064.
36. Orleans CT, Rimer BK, Fleisher L. Clear horizons: a quit smoking guide especially for those 50 and over. Philadelphia: Fox Chase Cancer Center, 1989.
37. Bonney GE. Regressive logistic models for familial disease and other binary traits. Biometrics 1986;42:611–25.
38. Bonney G. Compound regressive models for family data. Hum Hered 1992;42:28–41.
39. Kottke T, Brekke M, Solberg L, Hughes J. A randomized trial to increase smoking intervention by physicians: doctors helping smokers, round 1. JAMA 1989;261:2101–6.
40. Cummings S, Coates T, Richard R, Hansen B, Zahnd E, VanderMartin R, et al. Training physicians in counseling about smoking cessation: a randomized trial of the "Quit for Life" program. Ann Intern Med 1989;110:640–7.
41. Wilson DM, Taylor DW, Gilbert JR, Best JA, Lindsay EA, Willms DG, Singer J. A randomized trial of a family physician intervention for smoking cessation. JAMA 1988;260:1570–4.
42. Velicer WF, Prochaska JO, Rossi JS, Snow MG. Assessing outcome in smoking cessation studies. Psychol Bull 1992;111:23–41.
43. Kviz FJ, Clark MA, Prohaska TR, Slezak JA, Crittenden KS, Freels S, Campbell RT. Attitudes and practices for smoking cessation counseling by provider type and patient age. Prev Med 24:201–12.