Training Physicians about Smoking Cessation:

A Controlled Trial in Private Practices

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Study objective: *To test the hypotheses that physicians in private practice who receive a continuing education program (entitled "Quit for Life") about how to counsel smokers to quit would counsel smokers more effectively and have higher rates of long-term smoking cessation among their patients.*

Design: *Randomized trial with blinded assessment of principal outcomes.*

Setting: *Private practices of internal medicine and family practice.*

Subjects: *Forty-four physicians randomly assigned to receive training (24) or serve as controls (20) and consecutive samples of smokers visiting each physician (19.6 patients per experimental and 22.3 per control physician).*

Interventions: *Physicians received three hours of training about how to help smokers quit. Physicians and their office staffs were also given self-help booklets to distribute to smokers and were urged to use a system of stickers on charts as reminders to counsel smokers about quitting.*

Measurements and main results: *Based on telephone interviews with patients, physicians in the experimental group were more likely to discuss smoking with patients who smoked (64% vs. 44%), spent more time counseling smokers about quitting (7.5 vs. 5.2 minutes), helped more smokers set dates to quit smoking (29% vs. 5% of smokers), gave out more self-help booklets (37% vs. 9%), and were more likely to make a follow-up appointment about quitting smoking (19% vs. 11% of those counseled) than physicians in the control group. One year later, the rates of biochemically confirmed, long-term (≥ 9 months) abstinence from smoking were similar among patients in the experimental (3.2%) and control (2.5%) groups (95% confidence interval for the 0.7% difference: −1.7 to +3.1%).*

Conclusions: *The authors conclude that this continuing education program substantially changed the way physicians counseled smokers, but had little or no impact on rates of long-term smoking cessation among their patients. There is a need for more effective strategies to help physicians help their patients to quit smoking.*

Key words: cigarette smoking; continuing medical education; patient–physician relationships. J GEN INTERN MED 1989;4:482–489.

CIGARETTE SMOKING is the most important avoidable cause of premature death and disability in the United States.[1] Because approximately 70% of smokers see a physician at least once a year, physicians could influence a large number of smokers to quit.[2] Many physicians believe that smoking cessation is important; however, most feel poorly prepared to counsel smokers about quitting and only a few believe that their efforts are very successful.[3–5] With brief advice, physicians can influence as many as 4 to 5% of their patients to quit smoking.[6, 7] Their advice might have a greater impact if physicians were trained in more effective ways to counsel smokers.

Reviews and guides[8–11] suggest that physicians can effectively help smokers quit by: 1) routinely asking all patients if they smoke; 2) helping to motivate smokers to quit; 3) helping smokers plan specific quit dates; 4) following up with patients about smoking; and 5) offering self-help pamphlets. However, most physicians never use these strategies.[5]

We hypothesized that if physicians were trained to use these strategies, they would be more effective in helping patients to quit smoking. To test this hypothesis, we developed the "Quit for Life" (QFL) program, a program designed to teach physicians to use a systematic approach to counseling smokers based on these commonly recommended strategies. To test the effectiveness of this training program, we conducted two randomized trials; one was carried out in private practices of medicine and the other in a large health maintenance organization (HMO). In this article, we present the results of the training program among physicians who practice in a private office setting.

METHODS

We trained physicians to use a systematic approach to counseling smokers to quit. To determine whether this training changed physicians' behaviors, we interviewed patients after they visited their physicians to determine whether the physicians had counseled them about smoking cessation. To determine whether the training resulted in higher rates of smoking cessation among patients, we surveyed the same patients one year later about their smoking status.

Received from the Division of General Internal Medicine, Department of Medicine, (SRC, RJR, CLD, BH, RVM, TJC), the Department of Epidemiology and International Health, (SRC, TJC), and the School of Dentistry (BG), University of California, San Francisco, California, and the Department of Clinical Psychology, Kaiser-Permanente Medical Group, Oakland, California (BH).

Supported by Grant # CA38337 from the National Cancer Institute and by the Henry J. Kaiser Foundation Faculty Fellowship in General Internal Medicine (SRC).

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Subjects

Physicians. Invitations to participate were mailed to all internists and family practitioners in San Francisco who were on lists of the medical staff of local hospitals and the local medical society. The mailings included endorsements from the San Francisco Medical Society and an offer of continuing education credit for participation. All physicians who responded to the initial mailing were then contacted in person. Physicians reporting fewer than 20 outpatient visits per week were excluded. Those who then completed the baseline questionnaire were randomly assigned to either the experimental or the usual-care control group. To minimize crossover of patients or information between the two groups, we assigned members of the same group practice to the same condition.

To assess the representativeness of the physicians enrolled in the study, we also sent a questionnaire to a random sample of 100 physicians who did not respond to the invitation to participate in the study.

Smokers. All English-speaking smokers who made a visit to any doctor participating in the study were eligible for inclusion. We defined a smoker as anyone who had smoked a tobacco cigarette during the seven days prior to his or her visit. Patients were recruited by the physician's own office staffs or by members of our research staff. In either case, staff were instructed to ask all patients whether they smoked and to invite all smokers to participate in the study. After agreeing to participate in the study, some physicians, particularly those randomized to the control group, were reluctant to allow research staff to survey their waiting rooms and ask patients about smoking. As a result, more smokers in the control group (41%) than in the experimental group (24%) were enrolled by the physicians' own staffs.

Patients who agreed to participate filled out a baseline questionnaire before seeing the physician; those already enrolled during previous visits to a study physician did not. We recruited patients until we either had enrolled 30 smokers per physician within six weeks or a minimum of 15 smokers after more than six weeks, or had surveyed for four consecutive weeks without recruiting any additional patients. The recruitment, informed consent and data collection protocols were approved by the committee on human research at the University of California, San Francisco.

The "Quit for Life" Program

Physician Training. Physicians in the experimental group attended three one-hour seminars led by an internist or a psychologist. The purpose of the seminars was to demonstrate how to counsel smokers to quit and have physicians practice the counseling.

In the first seminar, the instructor showed a videotape of an encounter between a physician and a patient. It demonstrated an approach to counseling that included five steps: 1) Ask all patients whether they smoke and ask smokers if they are interested in quitting. For those who are interested in quitting, take the next steps. 2) Enhance the smoker's motivation to quit by asking about and reinforcing the smoker's own reasons for quitting. 3) Make a plan for quitting that includes a specific quit date and give a signed "Quit Date Prescription Form" with the smoker's quit date written on it. 4) Make at least one follow-up appointment with those who agree to a quit date. 5) Offer a self-help booklet about quitting to all smokers. After viewing the videotape, the physicians rehearsed these five steps in role-playing and were urged to use them with patients before the next seminar.

In the second seminar, conducted one or two weeks after the first, the participants discussed their experiences in counseling smokers. They reviewed ways to overcome obstacles to quitting, including fear of failing, weight gain, the influence of spouses, friends, and coworkers who smoke, stress, and withdrawal symptoms. The instructor recommended nicotine gum as an adjunct to counseling for smokers who had shown clinical evidence of addiction to nicotine manifested by withdrawal symptoms during previous attempts to quit, smoking within half an hour of waking in the morning, or smoking more than one pack of cigarettes per day. Participants also reviewed how nicotine gum should be used. During this second session, the instructor also discussed follow-up visits with smokers, along with problems encountered in such visits and ways to address each type of problem. The participants viewed a second videotape illustrating these techniques, and then, as in the first seminar, they used role-playing to rehearse a follow-up visit.

Participants attended a third session four to 12 weeks later. They discussed their experiences in counseling smokers since the initial training, and the instructor reinforced the importance and cost-effectiveness of counseling smokers and of follow-up visits about smoking cessation.

All seminars were conducted in local hospitals at times that fit with the schedules of the participating physicians. All 24 experimental physicians attended the first session, 20 attended the second session, and four who were unable to attend received the training privately in their office. Seventeen (71%) attended the third session.

Office Support. To supplement the training, we developed an illustrated self-help booklet that covered the benefits of quitting smoking, tips on how to quit, and suggestions for avoiding relapse; it was provided at no charge to all experimental physicians' offices. A member of the research staff visited nurses and office

staff in every experimental physician's office to discuss the program and the supporting office materials. We asked that, during their routine intake procedures, staff in each of these offices ask every patient whether he or she smoked. We also suggested that the staff attach a small colored sticker to every smoker's chart that read, "Did you counsel about smoking?" or, alternatively, to attach a quit-date prescription form. We gave each experimental physicians' office a large supply of free self-help booklets, reminder stickers, quit-date prescription pads, and posters for the waiting areas and examination rooms that encouraged smokers to ask their doctors for advice about quitting smoking.

Data Collection

Physicians. All physicians completed a baseline questionnaire about their training, type of practice, smoking history, and opinions and practices regarding smoking cessation counseling. Multi-item descriptors of attitudes about counseling smokers were adapted from the work of Wells and colleagues[12-14] and expressed in terms of a ten-point scale. Identical questions were included in a survey of physicians who did not participate in the trial.

Smokers. Before visiting their physicians, smokers completed a questionnaire about their demographic characteristics and smoking histories. They were asked to rate the question "How much do you want to quit smoking?" on a scale of 1 (not at all) to 10 (very much), and the question "How confident are you that you will *not* be smoking one year from now?" on a scale of 1 (not at all confident) to 10 (very confident). They were also asked whether their friends, family, or coworkers wanted them to quit smoking.

As soon as possible after the physician–patient visits, a member of the research staff, who was not aware of the patients' and physicians' assigned groups, interviewed all smokers by telephone. The interviewer asked whether smoking had been discussed during the visit, how many minutes had been spent discussing smoking, what steps the physician had recommended, what the smoker had agreed to do, and whether he or she had received a self-help booklet or a follow-up appointment about smoking.

Smoking Cessation and Biochemical Validation. Smokers were interviewed by telephone again one year after the first telephone interview to determine their current smoking habits and how many times they had tried to quit smoking (defined as abstinence for at least 24 hours). Those who had not smoked a cigarette during the seven days prior to the interview were defined as self-reported non-smokers; they were asked to have a breath test and give a saliva sample, and were offered $25 for these samples.

Concentrations of carbon monoxide in expired air from each patient were measured using an Ecolyzer Model 211 Carbon Monoxide Monitor (National Draeger, Pittsburgh, PA). Concentrations of cotinine in saliva were assayed using published methods.[15] If the concentration of cotinine in saliva exceeded 30 ng/ml, the patient was classified as a smoker. Patients who used nicotine gum were classified as smokers if the mean expired carbon monoxide in two samples of expired air exceeded 16 ppm.[16]

We analyzed the results of the patients' self-reported and biochemically validated abstinence from smoking. In calculating cessation rates, we counted as smokers all those who had been lost to follow-up or who reported quitting but refused biochemical testing; this is the most conservative approach and provided the primary test of our hypothesis. We also calculated cessation rates leaving out all those who had been lost to follow-up.

We calculated two rates of cessation for each measure: "short term," abstinence for at least seven days at the date of the telephone interview, and "long-term," abstinence for at least nine months as of that date. In both cases, biochemical validation was done only once, as soon as possible after the telephone interview. The length of abstinence was based on the participant's self-report.

Data Analysis

To test the statistical significance of differences between the intervention and control groups in baseline characteristics, we used chi-square tests for proportions and t-tests for means. To analyze the differences between the groups in patients' reports about physicians' counseling and in rates of abstinence, we first used large-sample difference-of-proportions and difference-of-means tests; we report these as 95% confidence intervals. We then adjusted for differences between the experimental and control groups in characteristics of both physicians and patients; we used multiple logistic regression (for proportions) and ordinary least-squares (for means) and calculated adjusted rates from the partial slopes associated with a dummy variable representing assignment to either experimental or control group.

To determine whether the intervention was more effective among patients who were interested in quitting smoking, we divided patients into two groups based on self-ratings of how much they wanted to quit on a scale from 1 (do not want to quit) to 10 (want to quit very much). Patients whose ratings were above the median (≥ 8) and those whose ratings were below the median (≤ 7) were analyzed separately. Again, we calculated rates of smoking with and without adjustment for differences between the experimental and control groups in baseline characteristics of patients and physicians.

Individual patients were the units of analysis for the results we are presenting. A few physicians were

clustered by offices and patients were clustered by physician. We tested the effect of this clustering in other analyses in which the sampling variances were adjusted for cluster sampling. These adjustments had no discernible effect on significance levels and did not alter our conclusions. We also analyzed our results using the physician as the unit of analysis. We analyzed differences in physicians' counseling behaviors using the means of patient reports for each physician. These results were similar to the results of the analyses in which patients were the units of analysis. Thus, we omitted them to simplify the presentation.

RESULTS

Baseline Characteristics

Physicians. Of the 844 private physicians who were sent invitations to participate, 164 responded to the initial mailing. Of these, 59 met our inclusion criteria, agreed to participate, and were randomized, 31 to the experimental group and 28 to the control group. After randomization, seven physicians (five experimental, two control) refused to participate. After we began to collect data in physicians' offices, we found that it was not feasible to continue data collection from eight offices (two experimental, six control) because they had too few patient visits (< 20 per week). Thus, 44 physicians (24 experimental, 20 control) completed the study. They represented 38 solo practices or partnerships (20 experimental, 18 control), with, at most, two participating physicians per office.

Of physicians who participated in the study, those in the experimental group were somewhat less likely to be female and significantly more likely to be board-certified in a subspecialty than those in the control group (Table 1). They also expressed less positive attitudes toward smoking cessation counseling on several attitude scales (aggressiveness, perceived counseling skills, importance of counseling). There were similar differences between experimental and control groups when we included all physicians who had initially been randomized.

We mailed the questionnaire to 100 physicians whom we selected at random from among the 680 physicians who did not respond to our invitation to participate in the study. Physicians who did not participate were significantly older ($p < 0.05$), worked more hours per week but spent less time in outpatient care, and reported prescribing nicotine gum to a smaller proportion of their patients who smoked compared with physicians who participated in the trial. Otherwise, participants and nonparticipants had similar attitudes about smoking cessation, physician counseling, and nicotine gum.

Patients. We enrolled 916 patients who smoked: 19.6 per experimental group physicians (range: 2 to 33) and 22.3 per control group physicians (range: 5 to 32). Compared with those in the control group, more patients in the experimental group were male and more were making their first visit to the study physician (Table 2). They were also younger and significantly more likely to use alcohol, to feel pressure to quit from family members, and to be confident that they

TABLE 1

Baseline Characteristics of Physicians in Control and Experimental Groups

	Control Group	Experimental Group
Distribution of physicians	20 (100%)	24 (100%)
Female	4 (20%)	2 (8%)
Board certification		
Family practice	5 (25%)	3 (13%)
Internal medicine only	10 (50%)	11 (46%)
Subspecialty	1 (5%)	7 (30%)
None	4 (20%)	3 (13%)
Smoking status		
Never smoked	15 (75%)	14 (61%)
Former smoker	4 (20%)	8 (35%)
Current smoker	1 (5%)	1 (4%)
Time spent in counseling about smoking during new patient visits*		
< 3 minutes	6 (30%)	16 (70%)
≥ 3 minutes	14 (70%)	7 (30%)
Attitudes about counseling (*mean scale scores*)		
Counseling aggressiveness (scale range: 0 = least to 10 = most aggressive)	6.0	4.8*
Counseling skills (scale range: 0 = least to 10 = most skilled)	7.3	6.3*
Importance of counseling (scale range: 0 = not to 10 = very important)	9.3	8.6*

*$p \leq 0.05$ for comparison of control and experimental groups by t-test for continuous data and chi-square test for categorical data.

TABLE 2

Baseline Characteristics of Patients in Control and Experimental Groups

	Control Group ($n = 446$)	Experimental Group ($n = 470$)
Female	61%	53%*
Mean age	45 years	43 years
College graduates	31%	31%
Mean cigarettes per day	21	20
Never drink alcohol	35%	28%*
First visit to this doctor	23%	30%*
"Family very much wants me to quit smoking" (agree)	38%	44%*
Want to quit smoking (mean, 10 point scale)	6.8	7.2
Have confidence in quitting (mean, 10-point scale)	4.9	5.4*

*$p \leq 0.05$ for comparison of control and experimental groups by t-test for continuous data and chi-square test for categorical data.

would quit in the future. On a scale from 1 (do not want to quit) to 10 (very much want to quit), 54.7% of smokers in the experimental group and 50.2% of smokers in the control group rated their desire to quit between 8 and 10. On the other hand, patients in the two groups did not differ in terms of education, cigarette consumption, or answers to a variety of questions about attitudes toward smoking (not shown in the table).

Of the 916 enrolled smokers, 824 (90%) were interviewed after their visit to the physician; 564 (68.4%) of these interviews were completed within seven days of the visit. At one-year follow-up, 16 patients had died (seven experimental, nine control); one-year follow-up interviews were obtained from 360 experimental patients (77.8% of survivors) and 364 controls (83.3% of survivors).

In the experimental group, 45 patients (9.7% of survivors) claimed abstinence for one week or longer; of these, 31 (68.9%) completed the biological validation. In the control group, 45 patients (10.3% of survivors) claimed abstinence and 37 (82.2%) of these completed the biological validation. Of the 68 patients who claimed to be abstinent and provided saliva samples, only one (a control-group patient) was reclassified as a smoker on the basis of biochemical testing. Overall, we obtained complete data (interviews about the visit, one-year follow-up interviews, and biochemical validation) from 71.1% of surviving patients in the experimental group and 83.1% of surviving patients in the control group (95% confidence limits for the difference: −17.8% to −7.3%).

Effects of Training on Physician Counseling

Based on interviews with patients, physicians in the experimental group discussed smoking with a greater proportion of smokers than did those in the control group (Table 3). When the subject of smoking came up, physicians in the experimental group spent more time discussing smoking with their patients and asked more smokers to set quit dates. More smokers in the experimental group agreed to set quit dates and more received quit-date prescriptions as reminders. Physicians in the experimental group also gave self-help booklets to more smokers, made more follow-up appointments to discuss smoking, and referred a few more patients to treatment programs than did those in the control group. The experimental and control groups did not differ in the frequency of prescribing nicotine gum.

All of these differences in physicians' performances remained statistically significant after adjustment for baseline differences between the characteristics and attitudes of physicians and patients in the experimental and control groups. In fact, the differences were generally greater after these adjustments.

Smoking Cessation

Similar numbers of patients in the two groups attempted to quit smoking during the year of follow-up (Table 4). There was no statistically significant difference between experimental and control groups in rates of smoking cessation based on self-report or biochemical validation. Adjusting for baseline differences be-

TABLE 3

Physician Counseling about Smoking during Visits*

	Control Group	Experimental Group	Experimental Minus Control Difference (95% CI)
All visits†			
Discussed smoking	44.4%	64.4%	+20.0% (+13.2 to 27.0)
Provided self-help booklet	9.3%	36.7%	+27.4% (+21.7 to +33.1)
Visits in which smoking was discussed‡			
Mean time spent discussing smoking	5.2 min	7.5 min	+2.3 min (+1.0 to +3.5)
Physician asked for quit date	12.4%	38.4%	+26.0% (+17.9 to +34.1)
Smoker agreed to quit date	5.1%	29.2%	+24.1% (+17.2 to +30.9)
Physician wrote reminder of quit date	1.1%	16.8%	+15.7% (+10.4 to +20.9)
Physician prescibed nicotine gum	19.4%	13.2%	−6.2% (−13.7 to +1.4)
Physician arranged follow-up appointment about smoking	10.6%	19.1%	+8.5% (+1.5 to +15.5)
Physician suggested a treatment program	13.3%	14.4%	1.1% (−5.8 to +8.1)

*Based on telephone interviews with patients after visits with their physicians.
†Smallest sample sizes 411 for experimental group and 407 for control group due to missing data.
‡Smallest sample sizes 261 for experimental group and 177 for control group due to missing data.

tween the characteristics and attitudes of physicians and patients in the experimental and control groups did not appreciably change these results.

We divided patients into those who most and those who least wanted to quit smoking (self-ratings of 8 to 10 and 1 to 7, respectively, on a ten-point scale). In the most motivated group, 4.9% of the experimental group patients and 3.3% of the control patients were validated quitters who reported abstaining from cigarettes for at least nine months (95% confidence interval for the 1.6% difference: −2.4 to +5.6%). In the less motivated group, the corresponding cessation rates were 1.5% of experimental group and 1.9% of control patients (95% confidence interval for the difference: −3.4 to +2.6%).

The rates of smoking cessation were higher when we excluded those who were lost to follow-up from the analysis rather than counting them as smokers. However, there were still no significant differences between the cessation rates in the experimental and control groups. Specifically, the rates of biochemically confirmed smoking cessation for at least nine months were 4.3% in the experimental group and 3.1% in the control group (95% confidence interval for the 1.3% difference: −1.8 to +4.3%).

TABLE 4

Smoking Cessation and Attempts to Quit among Patients in Control and Experimental Groups: One-year Follow-up*

	Control Group	Experimental Group	Experimental Minus Control Difference (95% CI)
Attempted to quit	36.6%	39.7%	+3.1% (−3.4 to +9.7)
Self-report			
Abstinent ≥ 9 months	2.7%	3.9%	+1.1% (−1.4 to +3.7)
Abstinent ≥ 1 week	10.3%	9.7%	−0.6% (−4.7 to +3.6)
Biochemical validation			
Abstinent ≥ 9 months	2.5%	3.2%	+0.7% (−1.7 to +3.1)
Abstinent ≥ 1 week	8.2%	6.7%	−1.5% (−5.2 to +2.1)

*Excludes subjects who are known to have died. Based on 437 patients in the control group and 463 in the experimental group. Non-respondents, those lost to fllow-up, and those who refused biochemical validation are counted as smokers.

DISCUSSION

We found that a three-hour continuing education program about how to counsel smokers, combined with supportive materials for physicians' offices, substantially changed the way physicians in private practice counseled patients about smoking. Those who had been trained discussed smoking with patients more often and longer, helped four times as many patients set quit dates, and gave self-help materials to four times as many patients as did physicians in the control group. However, these changes in physician behavior did not translate into significant changes in rates of smoking cessation among patients.

In most respects, these results confirm the findings of a randomized trial of the same training program among internists practicing in a large hospital-based HMO.[17] In that study, the training program produced substantial changes in the way physicians counseled patients and caused a small (2%) increase in long-term smoking cessation among the patients who were most interested in quitting smoking, but not among those who were less interested in quitting. Although we observed a similar (1.6%) increase in long-term smoking cessation among patients who were most interested in quitting, this difference was not statistically significant in this smaller group of patients.

These results are also consistent with other findings in continuing medical education programs for physicians. In aggregate, these studies suggest that training programs for physicians can substantially affect the behavior of physicians, but generally have less impact on patients' outcomes.[18]

More intensive training programs for physicians might achieve somewhat higher rates of smoking cessation among patients. Wilson and colleagues[19] recently found a 4% higher rate of smoking cessation (defined as three months of abstinence) among the patients of family physicians who underwent a training program about counseling smokers than among those of "usual-care" control physicians. The program tested in that study placed more emphasis on the use of nicotine gum and follow-up visits. Those investigators also encountered difficulties maintaining randomization. As in our study, physicians in the Wilson study were randomly allocated, but smokers were selected by the physicians' office staff, and those in the experimental group had greater motivation to quit than did those in the control group.

It is important to consider alternative methodologic explanations for our results. Could the findings be due to bias? Could crossover between groups have obscured a larger effect of the training program? Did physicians in the control group use other effective strategies that minimized the differences in smoking cessation? Did the study have sufficient statistical power to exclude substantially larger effects on smoking cessation?

Initial randomization did not produce an equal distribution of physician and patient characteristics between the experimental and control groups. This was further complicated by different drop-out rates of physicians after randomization and different follow-up rates of patients between the two groups. Nevertheless,

statistical adjustment for differences in baseline characteristics of both physicians and patients did not substantially change the large differences in physician counseling between the groups or the lack of difference in the rates of smoking cessation. We protected against observer bias by blinding interviewers to the group assignments of patients; thus, it is unlikely that any of these findings or the differential rates of patient follow-up were due to bias in the way the follow-up was conducted. Physicians in both experimental and control groups were aware that their patients were being asked about their smoking habits and about the counseling they had received about quitting. This may have enhanced the effects of the intervention by prompting experimental physicians to comply with the counseling steps outlined in the training sessions; alternatively, it may have minimized the effects of the intervention by prompting control physicians to increase their counseling about smoking.

There was little or no crossover between the groups. Experimental and control offices were physically separate. Only 2% of smokers in the control group reported receiving the distinctive red-and-grey self-help booklet that was distributed to 31% of patients by physicians in the experimental group. Furthermore, physicians in the control group asked only a small proportion of smokers to set quit dates, whereas that strategy was used much more often by physicians in the experimental group.

We found no evidence that physicians in the control group made significantly greater use of alternative strategies. Compared with physicians in the experimental group, those in the control group discussed smoking less often, spent less time counseling, gave out self-help materials less often, and referred the same number of patients to smoking cessation programs. Although physicians in the control group gave nicotine gum to a few more patients, this difference was not statistically significant. Physicians in our control group, however, may have counseled smokers more often than physicians in other studies. For example, in the study by Wilson and colleagues,[14] family practitioners in the usual-care group discussed smoking less often (in 31% of visits) and gave self-help material less often (in 2% of visits) than did internists in our control group.

Finally, because of the large number of patients in our study, the confidence intervals around these small differences are quite narrow. Thus, it is unlikely that the training program increased sustained smoking cessation rates among all patients by more than 4%.

It has been argued that physicians' interventions to help smokers quit are especially valuable because physicians' counseling about smoking could reach as many as 70% of smokers every year.[20] Thus, continuing education programs for physicians about smoking cessation could have a substantial impact on smoking rates if 1) these programs reach a large number of physicians, and 2) they effectively increase rates of long-term smoking cessation among the physicians' patients.

We have found that it is easier to reach physicians in large hospital-based groups, such as Kaiser-Permanente, than physicians in small private groups with this type of continuing education program. As a result of a single mailing and brief presentations at staff meetings, 45% of the internists in four large HMO groups participated in this training program and randomized trial.[17] In contrast, only 7% of private physicians participated despite similar mailings, the same offer of continuing education credit, additional endorsements from local physician leaders, and pre-stamped return postcards. Our experience with private physicians is similar to that of Gerbert and colleagues;[21] they were able to recruit only 3% of physicians in private practice to participate in a continuing education program about the management of obstructive lung disease despite a letter that offered a free textbook and continuing education credit. It is important to find ways to reach a larger number of physicians with continuing education programs.

Because of the low participation rate in this study, our results may not be generalizable to other groups of physicians. For example, it is possible that those who participated in this trial were more skilled at helping patients quit smoking and that the intervention would make a greater difference among physicians with less skill. However, we found that the physicians who participated in our study had attitudes and counseling practices about smoking similar to those physicians who declined to participate.

We found that this intensive continuing education program about smoking cessation substantially changed the way physicians counseled patients about smoking, but had no significant impact on the smoking behaviors of their patients. Thus, we believe that a need exists for more effective strategies for smoking cessation that are of practical use to physicians in the office. Since almost 40% of smokers in our experimental group were not counseled about smoking, we feel there may be room for more systematic and consistent reminders to physicians about discussing smoking. Such reminders could be provided by office staff or a computerized system.[22]

Setting quit dates seems to increase the likelihood that patients will attempt to quit smoking,[17, 23] but most who quit relapse. Withdrawal symptoms are a common cause of relapse.[24] Nicotine gum and clonidine reduce the severity of withdrawal symptoms[25, 26] and may increase cessation rates among smokers.[27-29] Perhaps more frequent prescription of these pharmacologic aids might increase long-term cessation rates. But we have also found that many physicians do not know how to instruct patients about how to use nicotine gum[30] and, therefore, programs designed to increase physi-

cians' prescriptions of pharmacologic aids must also train them about how to use those aids more effectively.

Kottke[31] has suggested that follow-up contacts with smokers may be the most important component of physician counseling about smoking. Physicians in the experimental group were urged to make follow-up appointments with patients to discuss smoking, but only a small proportion of patients who were counseled about smoking were scheduled for such visits. This may be partly due to the fact that such visits are generally not reimbursed by health care insurance plans.[5]

We believe that future programs designed to increase smoking cessation among medical patients should use a more systematic method for prompting physicians to counsel patients who smoke, encourage more effective use of pharmacologic treatments of withdrawal symptoms, and include reimbursement for follow-up visits about smoking cessation. The efficacy of more intensive programs should be tested by rigorous randomized trials.

The authors thank Elaine G. Zahnd, PhD, Morton J. Stein, MD, George Stone, PhD, Sharon Hall, PhD, Albert Martin, MD, and Neal Benowitz, MD, for their advice and assistance in the design and execution of the study; Dennis Black, PhD, for statistical consultation; Debbie Baniadam, BA, for administrative support; and Eleanor Haas for editorial assistance.

REFERENCES

1. U.S. Department of Health, Education, and Welfare. Smoking and health: a report of the surgeon general. Washington, DC: PHS Publication No. 79-50066, 1979.
2. Ockene JK. Smoking intervention: the expanding role of the physician. Am J Public Health. 1987;77:782-3.
3. Wechsler H, Levine S, Idelson RK, Rohman M, Taylor JO. The physician's role in health promotion—a survey of primary-care practitioners. N Engl J Med. 1983;308:97-100.
4. Ockene JK, Aney J, Goldberg RJ, Klar JM, Williams JW. A survey of Massachusetts physicians' smoking intervention practices. Am J Prev Med. 1988;4:14-20.
5. Cummings SR, Stein MJ, Hansen B, Richard RJ, Gerbert B, Coates TJ. Smoking counseling and preventive medicine: a survey of internists in private and HMO practices. Arch Intern Med. 1989;149:345-9.
6. Russell MAH, Wilson C, Taylor C, Baker CD. Effect of general practitioners' advice against smoking. Br Med J. 1979; 2:231-235.
7. Jamrozik K, Vessey M, Fowler G, Wald N, Parker G, Van Vunakis HV. Controlled trial of three different antismoking interventions in general practice. Brit Med J. 1984;288:1499-1502.
8. National Heart, Lung, and Blood Institute. Clinical opportunities for smoking intervention: a guide for the busy physician. Bethesda, MD: NIH Publication No. 86-2178, 1983.
9. Orleans CT. Understanding and promoting smoking cessation: overview and guidelines for physician intervention. Annu Rev Med. 1985;36:51-61.
10. Cummings KM, Strecher V, Pechacek TF. Counseling patients to stop smoking: a guide for HMO clinicians. HMO Pract. 1988;1:113-20.
11. Stokes J, Rigotti NA. The health consequences of cigarette smoking and the internist's role in smoking cessation. Adv Intern Med. 1988;33:431-60.
12. Wells KB, Ware JE, Lewis CE. Physicians' practices in counseling patients about health habits. Med Care. 1984;22:240-6.
13. Wells KB, Ware JE, Lewis CE. Physicians' attitudes in counseling patients about smoking. Med Care. 1984;22:360-5.
14. Wells KB, Ware JE, Leake B, Lewis CE. Do physicians preach what they practice? A study of physicians' health habits and counseling practices. JAMA. 1984;252:2846-8.
15. Jacob P, Wilson M, Benowitz NL. Improved gas chromatographic method for the determination of nicotine and cotinine in biologic fluids. J Chromatogr. 1981;222:61-70.
16. Cummings SR, Richard RJ. Optimum cut-off points for biochemical validation of smoking status. Am J Public Health. 1988;78:574-5.
17. Cummings SR, Coates TJ, Richard RJ, 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.
18. Haynes RB, Davis DA, McKibbon A, Tugwell P. A critical appraisal of the efficacy of continuing medical education. JAMA. 1984;251:61-4.
19. Wilson DM, Taylor DW, Gilbert JR, et al. A randomized trial of a family physician intervention for smoking cessation. JAMA. 1988;260:1570-4.
20. Ockene J. Smoking intervention: the expanding role of the physician. Am J Public Health. 1987;77:782-3.
21. Gerbert B, Goldstein K, Holden M, Hughes-Stone M, Guillion DS. Recruiting physicians for a continuing medical education study. Mobius. 1984;4:27-33.
22. McDonald C, Hui SL, Smith DM, et al. Reminders to physicians from an introspective computer medical record. A two-year randomized trial. Ann Intern Med. 1984;100:130-8.
23. Cummings KM, Giovino G, Emont SL, Sciandra R, Koenigsberg M. Factors influencing success in counseling patients to stop smoking. Patient Educ Couns. 1986;8:189-200.
24. Stitzer ML, Gross J. Smoking relapse: the role of pharmacologic and behavioral factors. In: Pomerlau OF, Pomerlau CS, eds. Nicotine replacement: a critical evaluation. New York: Alan R. Liss, 1988:163-84.
25. Hughes JR, Hatsukami DK, Pickens RW, et al. Effect of nicotine gum on the tobacco withdrawal syndrome. Psychopharmacology. 1984;82:82-7.
26. Glassman AH, Jackson WK, Walsh BT, et al. Cigarette craving, smoking withdrawal, and clonidine. Science. 1984;226:864-6.
27. Russell MAH, Merriman R, Stapleton J, Taylor W: Effect of nicotine chewing gum as an adjunct to general practitioners' advice against smoking. Br Med J. 1983;287:1782-5.
28. Tonneson P, Fryd V, Hansen M, et al. Effect of nicotine chewing gum in combination with group counseling on the cessation of smoking. N Engl J Med. 1988;318:15-8.
29. Glassman AH, Stetner F, Walsh T, et al. Heavy smokers, smoking cessation, and clonidine: results of a double-blind, randomized trial. JAMA. 1988;259:2863-6.
30. Cummings SR, Hansen B, Richard RJ, Stein MJ, Coates TJ. Internists and nicotine gum. JAMA. 1988;260:1565-9.
31. Kottke TE, Battista RN, DeFriese GH, Brekke ML: Attributes of successful smoking cessation interventions in medical practice: a meta-analysis of 39 controlled trials. JAMA. 1988;259:2883-9.