Nurse-assisted Counseling for Smokers in Primary Care

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■ *Objective:* Physician-delivered advice to stop smoking is effective, but time demands often reduce the number of smokers who receive assistance. We evaluated three nurse-assisted interventions designed to minimize physician burden and increase counseling in primary care settings.

■ *Design:* Randomized controlled trial with a 12-month follow-up.

■ *Setting:* Internal medicine and family practice offices in a health maintenance organization.

■ *Participants:* Smokers ($n = 3161$) who were patients of participating physicians or other medical care providers ($n = 60$).

■ *Intervention:* Medical care providers delivered a 30-second stop-smoking prompt to 2707 smokers and referred them to an on-site nurse smoking counselor. The nurse randomly provided a two-page pamphlet (advice control) or one of three nurse-assisted interventions: 1) self-quit training; 2) referral to a group cessation program; or 3) a combination of self-quit training and referral. Each nurse-delivered intervention included a 10-minute video, written materials, and a follow-up phone call.

■ *Results:* Physicians delivered brief advice to 86% of identified smokers during the 1-year program. The proportion of participants reporting abstinence after both 3 and 12 months of follow-up nearly doubled ($P = 0.01$) for the nurse-assisted self-quit (7.1%), group-referral (7.6%), and combination (6.9%) interventions, compared to brief physician advice alone (3.9%) ($P < 0.05$). Salíva cotinine tests confirmed these effects ($P < 0.004$), although quit rates were lower (3.4%, 4.7%, 4.3%, and 2.3%, respectively) because roughly one half of quitters chose not to provide a saliva sample and were counted as smokers.

■ *Conclusion:* Involving nurses in counseling smokers reduces physician burden, makes counseling more likely, and significantly increases cessation rates compared with brief physician advice alone.

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Physician-delivered, stop-smoking interventions significantly improve quit rates among smoking patients (1-6). Unfortunately, only about one half of physicians in nonresearch settings consistently counsel smokers (7-11), and fewer than one half of all smokers report that a physician has ever advised them to quit (12-14). Given the pressures of routine medical practice, it is not surprising that physicians do not take 3 to 5 minutes to counsel every smoking patient they see. Tobacco counseling competes with other pressing clinical tasks; physicians are often too busy to routinely and repeatedly counsel all patients who smoke (11, 15-17). Physicians will deliver a cessation protocol as part of a study (5, 6, 18), but barriers such as a lack of time, training, and confidence make counseling in nonresearch settings less likely (1, 4, 19, 20).

New approaches (21-23), such as involving other office staff in counseling (17, 24, 25), are needed if tobacco counseling is to become a consistent and sustainable part of medical care delivery (26). Because physicians see roughly 70%, or 38 million, of the 53 million smokers in the United States each year (15), even a modestly effective physician-driven intervention would have considerable impact on the nation's health.

This study tested the feasibility and effectiveness of a team counseling approach designed to minimize the burden on physicians by using non-physician clinic staff to provide the more time-consuming parts of cessation counseling. Key features of the team approach were a brief (30-second) physician-delivered cessation message, referral to an on-site nurse or other staff for additional cessation support, and the use of videos to deliver much of the intervention in an efficient and standardized manner.

A previous report of process and short-term outcome measures showed that this organized team approach proved practical and sustainable (27). The participating physicians and other providers delivered brief advice to 86% of identified smokers during the 1-year intake period, and most patients (87%) saw the counselor for materials and additional counseling. Nurse-assisted counseling led to significantly improved quit rates at 3 months compared with brief physician advice alone. We present the effects of the intervention on long-term abstinence at 1 year.

Methods

Setting

We conducted our study in two large primary care facilities of Kaiser Permanente Northwest Region, a group-practice health maintenance organization (HMO) in Portland, Oregon. Receptionists asked patients between 18 and 70 years of age to complete a health habit survey while waiting for their visit. The patients were seeing 1 of 60 primary care physicians ($n =$

42), physician assistants (n =7), or nurse practitioners (n =11) in outpatient internal medicine and family practice offices.

Intervention

Regular clinic nurses and clinical assistants collected the surveys as patients were taken to examination rooms and attached a notice to the medical charts of smokers (n = 3161) to alert providers to deliver a brief stop-smoking advice message. Providers were oriented to their role in a 1-hour training session. They were encouraged to use their own words but to not go beyond the following basic 30-second message:

"The best thing you can do for your health is to stop smoking and I want to advise you to stop as soon as possible. I know it can be hard and many try several times before they finally make it. You may or may not want to stop now, but I want you to talk briefly with our health counselor, who has some tips to make stopping easier when you decide the time is right."

The 2707 (86%) smokers who received the provider advice message were considered participants in the study, regardless of whether they were willing to see the counselor or had any interest in quitting smoking. By the end of follow-up, 16 patients died, leaving a total sample of 2691.

At the conclusion of the physician consultation, patients were seen by an on-site project nurse or health counselor who described what would be offered and obtained verbal consent to proceed. Patients who would not see the health counselor were mailed materials appropriate to their treatment assignment. Two random digits contained in the patient's health record number were used to assign patients to one of the following four interventions: advice, self-quit, group-referral, or combination treatment. Physicians remained blind to treatment assignment. Advice participants received the 30-second provider advice message and a brief pamphlet, *Why Do You Smoke?*, from the health counselor. This clear and systematic advice would probably be more effective than no treatment or usual care, which were not included for logistic and ethical reasons.

The self-quit condition included cessation advice, a carbon monoxide assessment, and a 10-minute "How to Quit Smoking" video designed specifically for this population. The video focused on the need to make a personal decision to quit, the steps to successful quitting, the frequent need for repeated efforts, and the importance of setting a specific quit date and using substitutes to smoking. The counselor provided a stop-smoking kit including smoking substitutes such as gum, toothpicks, and cinnamon sticks. A choice of one of three stop-smoking manuals was offered. Most participants chose the National Cancer Institute's manual, *Quit for Good* (54%), although others chose *Calling it Quits* (17%) or a two-part workbook produced by the American Lung Association titled, *Freedom from Smoking in 20 Days* and *A Lifetime of Freedom from Cigarettes*, respectively (29%). Patients were encouraged to set a specific quit date or some other specific plan of action and the counselor arranged to call the patient, usually within 2 to 4 weeks, to check on progress toward cessation. Patients were also mailed a set of stop-smoking tip sheets and a series of six professionally designed bimonthly newsletters devoted to smoking cessation.

Group-referral participants also received advice, the carbon monoxide assessment, and a video. In this case, however, the video encouraged patients to join the HMO's intensive stop-smoking group program known as "Freedom from Cigarettes." This program entails nine group meetings over 2 months. In a recent study, this program achieved roughly a 35% biochemically verified 1-year quit rate (28). Patients were provided a brochure, a schedule of group sessions, and a time-limited coupon to waive the program fee. Efforts were made to schedule the patient for an upcoming group. Reminder postcards were sent 1 week before the scheduled meeting, and patients were called several days after the meeting to check on progress and, if necessary, to reschedule.

Combination participants also received advice, the carbon monoxide assessment, and a third video, which described both the self-directed and the professionally led group approaches to smoking cessation. Self-directed cessation techniques, as well as the pros and cons of joining a professionally run program, were presented. Participants were asked to choose an approach that made sense for them. The self-help manual, stop-smoking kit, group materials, and fee-waiver coupon were all provided. Participants were encouraged to either set a quit date or sign up for a specific group session, and a telephone call was arranged to check on progress. Tip sheets and the bimonthly newsletters were mailed to all combination participants.

Follow-up and Analyses

Participants were surveyed by mail 3 and 12 months after their initial visits. Nonresponders were interviewed by telephone by an assessor who was blind to treatment assignment. Participants reporting abstinence from tobacco for at least 7 days before the 12-month assessment were asked to schedule appointments at a convenient clinic location or at their homes to provide saliva samples for biochemical confirmation. The primary end point was a "two-point prevalence" measure, which was defined as consecutive abstinence at both the 3- and 12-month assessments. Nonrespondents and those lost to follow-up were considered to be smokers.

Results

As shown in Table 1, participants in the four treatment groups were similar in terms of baseline age, sex, race, education, occupation, cigarettes smoked per day, stage of change, confidence in ability to quit, perceived degree of overweight, and subjective health status (27).

Self-reported smoking status was obtained on a high percentage of participants at both the 3-month (88%) and 12-month (86%) follow-up assessments. Response rates did not differ significantly across treatment groups. The proportion of participants who reported one or more serious attempts to quit in the year following their clinic visit was significantly higher ($P < 0.004$) among self-quit participants (53%) relative to advice participants (46%). Group-referral (48%) and combination participants (50%) did not differ from advice participants in terms of quit attempts.

All three nurse-assisted interventions—self-quit, group referral, and combination—resulted in higher 3-month point prevalence quit rates than did the advice treatment (Table 2). At the 12-month follow-up, a larger percentage of participants reported abstinence, although differences between treatment arms were reduced. The 12-month point prevalence definition of abstinence, however, includes both long-term ex-smokers and those who quit as little as 1 week before the 1-year follow-up. With the more conservative primary end point, consecutive abstinence at both the 3-month and 12-month assessments, the three nurse-assisted interventions were superior to the advice intervention. Because quit rates for the three nurse-assisted interventions were similar for all analyses ($P > 0.2$), they were collapsed and compared to the advice intervention. Quit rates in the nurse-assisted groups were significantly higher than advice for the 3-month (6.8% versus 12.3%, $P < 0.001$), 12-month (12.7% versus 15.8%, $P < 0.03$), and 3-month plus 12-month outcomes (3.9% versus 7.2%, $P < 0.001$).

Intensive efforts were made to collect saliva samples from all participants reporting abstinence at 12 months, including offers to meet with participants at their homes or other convenient locations. Even so, only about one

Table 1. Baseline Characteristics by Treatment Group*

Characteristic	Advice	Nurse-assisted		
		Self-Quit	Group-Referral	Combination
Mean age, *y*	40.4	40.3	39.5	40.4
Female, %	61.6	59.8	55.9	58.6
Non-white, %	8.9	7.5	7.6	8.2
Some college education, %	59.2	62.5	63.3	62.7
Professional or technical occupation, %	24.3	25.6	27.9	24.9
Considering quitting, %	69.8	71.0	72.3	68.4
Mean cigarettes per day, *n*	17.8	18.4	18.4	18.4
Mean confidence in quitting (10-very confident)	5.3	5.4	5.4	5.2
Mean perceived weight (4-very overweight)	2.6	2.6	2.6	2.6
Excellent or good perceived health status, %	63.6	63.0	63.0	61.2

* No statistically significant differences were noted.

half (55%) of reported quitters provided a saliva sample. Compliance with saliva collection procedures did not differ by treatment assignment ($P > 0.2$). Among those providing samples, confirmation rates in the advice (98%), self-quit (98%), group-referral (93%), and combination (88%) groups were high and did not differ by treatment assignment ($P > 0.2$). The percentage of self-reported 12-month quitters for whom biochemical confirmation of abstinence was obtained was also similar ($P > 0.2$) across groups (49%, 48%, 56%, and 53%, respectively). If abstinence is defined as reported 3-month plus 12-month cessation plus 12-month biochemical confirmation and those not providing saliva samples are counted as smokers, then the overall quit rates are reduced by half. Even with this conservative procedure, differences between the three nurse-assisted interventions and the advice treatment remained statistically significant (2.3% versus 4.1%, $P < 0.01$).

In a separate analysis, the group-referral and combination groups were collapsed, and quit rates were computed for patients who attended and did not attend the multi-session group cessation program. Those who chose to attend the group program (9.5% for both conditions combined) were significantly more likely than nonattenders to be consecutively abstinent at both 3 and 12 months (22% versus 6%, $P < 0.001$).

Logistic regression analyses were used to determine if intervention was more effective for those who were contemplating (31, 32) quitting at the time of the baseline assessment compared with those who were not initially considering quitting. The model included baseline contemplation status (yes/no) and three indicator variables comparing the three nurse-assisted interventions to advice. Table 3 shows that contemplators were more than twice (odds ratio, 2.08) as likely as precontemplators to report consecutive abstinence at the 3-month and 12-month visits. As before, self-quit, group-referral, and combination participants were all significantly more likely to quit than those in the advice group. Three contemplation-by-treatment interaction terms were also included at step two of a hierarchical model to determine if any of the nurse-assisted treatments had different effects for contemplators and precontemplators. None of these interaction terms contributed significantly to the overall model, which indicates that the proportional increase in quit rates resulting

Table 2. Smoking Cessation Outcomes

Outcomes	Advice (n = 708)	Nurse-assisted			*P* Value*
		Self-Quit (n = 675)	Group-Referral (n = 675)	Combination (n = 633)	
	← % →				
3-month					
No cigarettes	6.8	12.2	13.0	11.7	0.001
No tobacco use	6.2	11.1	12.0	10.7	0.001
12-month					
No cigarettes	12.7	16.0	15.1	16.3	0.12
No tobacco use	11.6	14.5	14.8	14.9	0.11
3- and 12-month†					
No cigarettes	3.9	7.1	7.6	6.9	0.01
No tobacco use	3.5	6.4	7.0	6.5	0.02
3- and 12-month confirmed‡					
No cigarettes	2.3	3.4	4.7	4.3	0.04
No tobacco use	2.1	3.3	4.6	4.1	0.04

* One-tailed tests with nonrespondents counted as smokers.
† Abstinent at both the 3- and 12-month assessments.
‡ Cotinine confirmed at 12-month assessment.

Table 3. Consecutive 3- and 12-Month Abstinence by Contemplation Status and Treatment Group

Participants by Group	Odds Ratio	95% CI
Contemplators versus precontemplators	2.08	1.61 to 2.68
Self-quit versus advice	1.44	1.08 to 1.94
Group-referral versus advice	1.40	1.04 to 1.88
Combination versus advice	1.37	1.01 to 1.85

from the nurse-delivered interventions was similar for precontemplators and contemplators.

Discussion

Adding nurse-assisted interventions to brief provider advice significantly increased sustained abstinence at a 1-year follow-up. This pattern of results held whether all self-reported quitters or only biochemically confirmed quitters were analyzed. We have previously reported the nurse-assisted program to be acceptable and sustainable in large part because it minimized demands on providers (27). The present findings show that these interventions also nearly doubled the long-term quit rate relative to a brief physician message alone. If a no-advice or usual care group had been included, we would have expected considerably larger differences.

Our primary outcome was self-reported consecutive abstinence at two points in time, rather than biochemically confirmed abstinence. Velicer and colleagues (29, 30) argue that for minimal intervention studies in naturalistic settings, biochemical testing is unnecessary, as well as impractical, because of high refusal rates. We did, in fact, experience considerable difficulty in collecting saliva samples for biochemical testing from many of these patients who had received a brief unsolicited intervention 1 year earlier. The rates of refusal and lack of confirmation of self-reported status did not, however, vary by treatment assignment. We believe that such participants are often simply suspicious or indifferent toward research or have concerns about being tested for drugs or the acquired immunodeficiency syndrome. Although it does not seem reasonable to assume that these "refusers" were all smokers, we applied this assumption in our most conservative analyses. Requiring biochemical confirmation as the measure of abstinence did not, however, alter the basic conclusions of this study.

The three nurse-assisted interventions achieved similar results, albeit by somewhat different routes. All three shared the key, nonspecific elements of attention and support from a second health professional. In a previous paper (27), we reported that self-quit participants were more likely to set quit dates at the time of the visit, whereas referral patients were more likely to attend a group program. Furthermore, those who attended a group program were far more likely to quit than those who did not (22% versus 6%). Combination-treatment patients chose a mix of strategies but were less likely to select quit dates than were self-quit patients (22% versus 28%) and less likely to attend a group than the referral patients (8% versus 11%). Although the three nurse-assisted interventions differed in content, the intensity and amount of contact were similar, as were the long-term quit rates. Perhaps what the nurse did was less important than that he or she did something to support cessation.

Support was found for the stage-of-change theory (31, 32). Patients who were seriously contemplating quitting before intervention were significantly more likely than precontemplators to achieve sustained cessation (odds ratio, 2.1). But the absence of any treatment-by-contemplation status interactions indicated that the intervention effect size was similar for contemplators and precontemplators. Components of the intervention, especially the videos, did contain material designed to be relevant to precontemplators as well as contemplators. Still, because quit rates were considerably lower for precontemplators, it may be useful to focus more intervention resources on those contemplating or preparing to take action.

These interventions included only one office-based encounter (with telephone and mail follow-up), and patients were excluded from further intervention if they had been seen previously. In practice, one should take maximal advantage of repeated visits to promote readiness to quit, repeated quit attempts, and eventual maintenance. This would probably improve outcomes considerably. Elsewhere, we have recommended a stepped-care approach tailored to the patients' readiness to change and their quit-attempt history (33). This would include repeated advice for precontemplators, advice and additional self-quit instruction by the nurse for those who are contemplating quitting, and group referral for those who have failed a serious quit attempt or are reluctant to quit on their own. Referral to a structured treatment program is a practical and widely available option for physicians because several stop-smoking programs can be found in most communities. Nicotine replacement therapy has not been shown to be particularly effective in primary care settings (34, 35) but could be incorporated into a stepped-care regimen by referring patients to special group programs that include transdermal patches or nicotine gum therapy.

Counseling smokers is well within the scope of nursing practice (36) but would require that a physician's nurse spend 2 to 3 minutes with the few smokers each day who might have some interest in quitting. The use of videos minimizes the burden on nurses by providing needed skill training and role models for patients. The modest amount of nursing time needed to support a clinic-based cessation system should be accorded high priority within the nursing role. The alternatives are for physicians to increase their counseling time (which we view as more costly and less sustainable) or to continue in the present mode and frequently waste a powerful opportunity to modify the patient's most important health risk factor (7-14). The primary advantage of the team approach is that it makes smoking counseling easier to fit into a busy clinic routine, which in turn increases the likelihood that smokers will receive brief support and eventually quit.

In summary, our results show that physicians can save time and help more smokers quit by giving consistent, brief advice and by referring smokers to a nurse for additional information and support. Nurse-assisted

smoking counseling is well accepted by staff and patients, is sustainable, and significantly increases quit rates compared to brief physician advice alone.

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