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[Original Investigation]

Smoking Cessation in Hospitalized Patients: Results of a Randomized Trial

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Abstract

Background: Few research studies have evaluated the effectiveness of smoking interventions in hospitalized patients. This randomized controlled trial compared the efficacy of 2 smoking cessation programs in patients hospitalized in 4 community hospitals in a large health maintenance organization within the San Francisco Bay Area in California.

Methods: Patients were randomly assigned to usual care (n=990), nurse-mediated, behaviorally oriented inpatient counseling focused on relapse prevention with 1 postdischarge telephone contact (minimal intervention, n=473), or the same inpatient counseling with 4 postdischarge telephone contacts (intensive intervention, n=561). The main outcome measure, smoking cessation rate, was corroborated by plasma cotinine determination or family confirmation, 1 year after enrollment.

Results: At 1 year smoking cessation rates were 27%, 22%, and 20% for intensive intervention, minimal intervention, and usual care groups, respectively (P=.009 for intensive vs usual care). Subgroup analyses by diagnosis revealed that the odds of cessation among patients with cardiovascular disease or other internal medical conditions were greater among those receiving the intensive intervention than among their counterparts receiving usual care (odds ratios, 1.6 and 2.0, respectively).

Conclusions: A multicomponent smoking cessation program consisting of physician advice; in-hospital, nurse-mediated counseling; and multiple postdischarge telephone contacts was effective in increasing smoking cessation rates among hospitalized smokers. Hospital-wide smoking cessation programs could substantially increase the effectiveness of hospital smoking bans.

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Hospitalization is an opportune time to intervene with smoking, the single most important preventable risk factor for death and disability. According to the American Hospital Association, approximately 33 million hospital admissions occur annually, of which at least one quarter involve smokers. Moreover, hospital readmissions are twice as frequent among smokers. [1] Although many hospitals provide some type of smoking cessation program, most are implemented on an outpatient basis. Few patients enroll in outpatient programs even when referred by their physicians, [2] and attrition is high among those who enroll. [3] Inpatient smoking cessation programs can potentially reach a large proportion of the smoking population. Many patients are motivated to quit by the perceived vulnerability related to hospitalization for smoking-related illnesses. Smoking cessation programs can augment hospital smoking bans mandated by the Joint Commission on Accreditation of Health Organizations, [4] by helping patients, most of whom have quit smoking during hospitalization, to remain abstinent on hospital discharge. Hospitalization also enables frequent contact with health care professionals who can provide counseling on cessation.

In a previous study [5] of patients hospitalized with acute myocardial infarction (MI), we documented a 71% biochemically confirmed cessation rate at 12 months among patients receiving a smoking cessation intervention initiated in hospital and followed up with multiple postdischarge telephone contacts, compared with a 45% cessation rate in usual care. In a subsequent multiple risk factor intervention trial [6] of patients who had had MIs using the same experimental design, 1-year cessation rates were 70% in the intervention group compared with 53% in the usual care group.

Ockene et al [7] compared the effects of a single inpatient counseling session and 4 postdischarge follow-up telephone calls provided by health educators with usual care patients hospitalized for coronary angiography, and found similar results. Intervention patients had a higher cessation rate than usual care patients at 6 months (45% vs 34%) and 12 months (35% vs 28%), although these differences were not significant. Cessation was influenced by the severity of disease, with patients who had had MIs showing the highest cessation rates.

In a randomized controlled trial of a general population of hospitalized patients, Stevens et al [8] used smoking counselors to provide a 20-minute counseling session, a variety of self-help materials, and 1 postdischarge telephone call. Cessation rates at 12 months were substantially lower than in some other studies [5-7] : 9% in the usual care group and 14% in the intervention group. Given that the studies previously cited involved only patients with cardiovascular disease and featured multiple rather than single postdischarge follow-up contacts, it is not clear whether the lower cessation rates in the study by Stevens et al [8] were due to a less severely diseased population, a lesser number of follow-up contacts, or other potential reasons such as a lesser motivation.

The current trial extends the work of in-hospital smoking cessation studies to the general population. Our study was planned in 2 phases. In the first phase, patients were randomly allocated to receive an intensive, nurse-managed smoking intervention with multiple telephone follow-up contacts (n=330) or usual care (n=330). The quit rate at 1 year in those receiving the nurse-managed intervention was 31% compared with 21% in the usual care group. Results of this study [9] have been recently published. The second phase was designed to expand the scope of the research to compare the efficacy of the intensive intervention with a minimal intervention similar to that of Stevens et al, [8] which consisted of hospital-based counseling followed by a single telephone contact. During this second phase, patients continued to be randomized to usual care or intervention using a balanced randomization procedure within each of the 4 participating hospitals. The purpose of our article is to compare the efficacy of the 2 interventions.

PATIENTS AND METHODS

Between February 1991 and November 1993, smokers admitted to Kaiser Permanente Medical Centers in San Jose, Santa Clara, Hayward, and Oakland, Calif, were considered for the study. Project nurses identified smokers by computer-generated census logs and cards prepared by ward clerks and nurses. Verification of smoking status in the month prior to hospitalization was obtained by chart review and staff nurses' interviews at the bedside. Patients who reported using cigarettes, cigarillos, cigars, or pipe tobacco during the month prior to hospitalization were classified as smokers.

All smokers, except those admitted to obstetrical or psychiatric wards, were interviewed by project nurses regarding their motivation to quit smoking, their continued residence in the area during the succeeding year, and their history of alcohol and drug abuse. Patients who were unable to read or speak English, did not plan to remain in the San Francisco Bay Area in California over the next year, whose level of consciousness was impaired, whose hospitalization was expected to be less than 36 hours, whose medical record revealed a primary diagnosis of alcohol or drug abuse, or who were involved in a post-MI rehabilitation program called MULTIFIT [6] were excluded. Patients who stated that they had no intention of quitting smoking or who stated that they wanted to quit on their own were also excluded. Informed consent was obtained from all remaining eligible patients at the time of the project nurses' initial interviews. The study was approved by both the Stanford University Institutional Review Board, Palo Alto, Calif, and the Kaiser Foundation Research Institution Review Board, Oakland.

Psychosocial measures obtained by the project nurses at baseline included a 48-item smoking history, strength of addiction measured by 5 items taken from the modified Fagerstrom Tolerance Questionnaire, [10] a measure of weekly consumption of alcohol, and a global question regarding confidence to quit smoking. Demographics and admitting and discharge diagnoses were also recorded for all patients.

Within each hospital, eligible patients were randomly allocated to intensive intervention, minimal intervention, or usual care groups. Nurses opened sealed envelopes in front of patients to determine patients' assignments.

Following randomization, patients in all 3 groups received standardized physician advice. Physicians were prompted to go to the bedside to deliver a 1- to 2-minute unequivocal message about the necessity to quit smoking, based on a 1-page scripted prototypic Physician Advice Statement posted on the front of each patient's medical record. Patients received this advice from their primary care physician or an attending resident.

In addition to strong physician advice, patients assigned to the usual care group received a standard booklet developed by the American Heart Association entitled Calling It Quits. These patients were also offered a list of outpatient smoking cessation programs offered for a copayment of $35 to $55 by the Kaiser Permanente Medical Care Program.

Patients assigned to minimal or intensive interventions received a 30-minute, nurse-mediated behavioral counseling session provided at the bedside. This behavioral counseling session incorporated principles of social learning theory [11] combined with relapse prevention therapy. [12] The 14-item expanded version of the self-efficacy scale designed by Baer et al [13] helped project nurses identify situations in which patients were at high risk for relapse and facilitated cognitive and behavioral strategies to assist patients in coping with the situations for which they expressed less than 70% confidence to resist the urge to smoke. [5] Patients were encouraged to develop their own strategies for dealing with high-risk situations. In addition, project nurses provided likely scenarios for patients and role-played coping strategies.

A 16-minute videotape about smoking relapse developed by the American Heart Association excerpted from a series entitled An Active Partnership for the Health of Your Heart was shown to patients prior to the counseling session. Project nurses reviewed the benefits of quitting and counseled patients about weight gain, use of alcohol, the problem of loss and deprivation when quitting, what to do if a slip or lapse occurred, and how to enlist social support. This counseling closely matched a 16-page workbook provided to patients that accompanied the Active Partnership Program. Patients were also given an audiotape incorporating deep breathing and muscle relaxation exercises and were asked to listen to the tape for 15 minutes daily in the month after hospital discharge.

Patients who met the criteria for nicotine dependence based on the use of the modified Fagerstrom Tolerance Questionnaire, [10] or who were noted to have severe withdrawal symptoms during hospitalization, as noted from a single-item measure on the smoking history, were offered nicotine replacement therapy. Program nurses obtained prescriptions from primary care physicians and instructed patients on the appropriate use of either nicotine gum or patch. Written instructions for the use of these agents, including a schedule for decreasing use after 8 to 12 weeks were provided. Finally, patients signed a contract with the project nurse explicitly acknowledging their willingness to refrain from smoking after discharge.

In addition to the in-hospital counseling, patients in the minimal intervention group received a single 10-minute telephone call from the project nurse 48 hours after discharge. Encouragement and support were provided during this call. Patients who had relapsed were encouraged to attempt to set another quit date. No further contact with the project nurse was provided after 48 hours.

Patients in the intensive intervention group received four 10-minute telephone contacts at 48 hours and at 7, 21, and 90 days after discharge. Standard telephone algorithms allowed the project nurse to provide feedback, problem solve difficulties with urges, determine whether relapse had occurred, and offer additional help. Patients relapsing within 90 days were offered 1 additional 30-minute face-to-face counseling session with the project nurse if they desired. During this visit project nurses reviewed the relapse situation, reinforced hazards associated with continuing to smoke and the benefits of quitting, and obtained a prescription for nicotine replacement therapy if needed. Patients receiving the intensive follow-up had no further contact with the project nurses after 90 days.

At 3, 6, and 12 months, all patients were telephoned by the Stanford University-based operations staff to ascertain their self-reported smoking status. Data on smoking relapse and use of nicotine replacement therapy were also obtained.

At 12 months all study patients stating that they were smoking were classified as smokers. Those stating that they had not smoked or even taken a puff of a tobacco product in the past 7 days were asked to return to their respective hospitals to provide blood samples for determination of plasma cotinine levels, which were used to corroborate self-reports. A specific protocol was followed to attempt to obtain biochemical verification. After 3 attempts by telephone, patients were sent a letter offering them $25 to return to the hospital laboratory. Home visits for saliva cotinine were offered to those unable to return to the hospital laboratory. When it was impossible to obtain cotinine measures by laboratory or home visit, smoking status was verified by a family member.

Patients dropping out of the study or unavailable for follow-up and those using nicotine replacement therapy at the time of final confirmation were classified as smokers. Patients who reported smoking, who had cotinine levels of more than 15 ng/mL, or who had a family member fail to corroborate their self-reported nonsmoking status were classified as smokers. Continuous 1-year abstinence rates were based on self-reported status at 3 and 6 months and confirmed status at 12 months.

Training of the project nurses was highly standardized. They received 8 hours of didactic and interactive training conducted by the investigators and nurse coordinator. Role-playing of patient counseling sessions was conducted, case studies were presented, and telephone interview techniques were practiced. A training manual developed for this project was provided. To assure quality control, project nurses were asked to tape their initial counseling sessions for critique by the investigators. Throughout the entire period of enrollment and treatment, nurses attended monthly staff meetings during which case studies were reviewed and further training was provided.

Kruskal-Wallis and chi squared procedures were used to compare baseline characteristics among treatment groups to ensure that randomization of patients to the 3 groups was successful. The Mantel-Haenszel test of homogeneity of effects was performed to determine whether the data from the 4 hospitals could be pooled for outcome efficacy analyses, and chi squared analyses on the pooled data provided a test of outcome efficacy of the interventions. Odds ratios (ORs) and 95% confidence intervals (CIs) were also calculated to compare outcomes between groups.

RESULTS

In phase 1, patients were randomized to intensive intervention (n=330) or to usual care (n=330). In phase 2, an additional 231 were randomized to intensive intervention, 660 to usual care, and 473 to minimal intervention. No significant differences in cessation rates were noted among patients receiving intensive intervention in phase 1 vs phase 2 or among patients receiving usual care in phase 1 vs phase 2. Accordingly, patients in the 2 phases were pooled for comparison with those receiving the minimal intervention in phase 2.

By 12 months, 21 (4%) of 561, 13 (3%) of 473, and 48 (5%) of 990 patients in these groups had died, leaving 540 (intensive intervention), 460 (minimal intervention), and 942 (usual care) patients for final data analysis. No significant differences were found on any baseline characteristics among the intensive intervention, minimal intervention, and usual care groups (Table 1).

Variable	Intensive (n=540)	Minimal (n=460)	Usual Care (n=942)
Males, % (No.)	52 (280/540)	48 (221/459)	52 (489/941)
Education ≤high school, % (No.)	48 (250/525)	49 (223/458)	47 (442/932)
Ethnicity, % (No.)			
White	71 (379/534)	70 (322/457)	65 (609/933)
African American	14 (74/534)	16 (75/457)	17 (160/933)
Hispanic	9 (49/534)	10 (45/457)	11 (101/933)
Other	6 (32/534)	4 (16/457)	7 (63/933)
Mean (±SD) age, y	50±13	51±13	51±13
Employed, % (No.)	69 (370/539)	63 (290/459)	62 (584/942)
Mean (±SD) confidence, %	70±26	69±26	67±26
Mean (±SD) cigarettes per d	21±13	20±13	20±13
Other tobacco products, % (No.)†	1 (6/540)	1 (4/460)	2 (17/942)
Alcoholic drinks per wk, No. (range)‡	5 (1-56)	4 (1-56)	6 (1-126)
Addiction§	14±4	14±4	14±4
Primary reason for hospitalization, % (No.)			
Cardiovascular disease	34 (182/540)	30 (138/460)	33 (310/942)
Cancer	5 (25/540)	3 (12/460)	4 (37/942)
Pulmonary	12 (67/540)	10 (46/460)	12 (113/942)
Other internal medicine	29 (157/540)	30 (137/460)	26 (242/942)
Gynecological	7 (36/540)	9 (40/460)	8 (71/942)
Orthopedic	8 (42/540)	9 (41/460)	9 (89/942)
Surgery	5 (25/540)	8 (37/460)	8 (74/942)
Psychosocial or alcohol or drug	<1 (1/540)	<1 (2/460)	0 (0/942)
Missing	1 (5/540)	2 (7/460)	1 (6/942)

*The sample sizes vary slightly by variable because of missing data. Percentages are calculated on available number for each variable. Significance was set at P<.01 to adjust for multiple baseline tests. All values were rounded to the nearest whole number.
†Number of patients who used tobacco products other than cigarettes.
‡Represents the median number of drinks per week and includes only those patients reporting 1 drink per week or more (40% of sample in each group).
§Addiction measured using modified Fagerström Tolerance Questionnaire.[9]

Table 1. Baseline Characteristics and Primary Reason for Hospitalization for Intensive Intervention, Minimal Intervention, and Usual Care Patients*

The Mantel-Haenszel test of homogeneity of effects for hospitals was nonsignificant for the intensive intervention group vs the usual care group and the minimal intervention group vs the usual care group, indicating the data from the 4 hospitals could reasonably be pooled for analyses.

By 12 months 55 (10%) of 540 intensive intervention patients, 47 (10%) of 460 minimal intervention patients, and 92 (10%) of 942 usual care patients were unavailable for follow-up; they were considered smokers for all analyses. The 12-month confirmed cessation rates pooled across hospitals were 144 (27%) of 540, 101 (22%) of 460, and 191 (20%) of 942 for intensive intervention, minimal intervention, and usual care groups, respectively (P=.02). The difference in cessation rates between intensive intervention and usual care groups was statistically significant (P=.009, OR=1.4, 95% CI=1.1-1.8). The difference in cessation rates between patients receiving the minimal intervention and those receiving usual care was not significant (P=.47, OR=1.1, 95% CI=0.83-1.5), nor was the difference significant between intensive and minimal intervention groups (P=.08, OR=1.3, 95% CI=1.0-1.7).

The 12-month self-reported cessation rates were 35%, 29%, and 29% for intensive intervention, minimal intervention, and usual care patients. The difference in the proportion of patients who reported not smoking at 12 months and those who were confirmed nonsmokers by cotinine level or family member was 8% for intensive intervention, 7% for minimal intervention, and 9% for usual care. The 1 patient who was still using nicotine replacement therapy at 1 year was considered a smoker.

Eighty-five (16%) of 540 patients in the intensive intervention returned for an outpatient face-to-face counseling visit within 3 months of hospital discharge, of whom 10 (12%) of 85 were confirmed nonsmokers at 12 months.

Continuous 1-year abstinence rates were 100 (19%) of 540 for the intensive intervention group, 64 (14%) of 460 for the minimal intervention group, and 122 (13%) of 942 for the usual care group. Two hundred thirty-seven (44%) of 540, 179 (39%) of 460, and 272 (29%) of 942 of the intensive intervention, minimal intervention, and usual care patients were prescribed nicotine therapy during the course of the study of whom 44 (19%) of 237, 24 (13%) of 179, and 32 (12%) of 272, respectively, were confirmed nonsmokers at 12 months. These rates are lower than the cessation rates of patients who were not prescribed nicotine therapy: 100 (33%) of 303, 77 (27%) of 281, and 159 (24%) of 670 of intensive, minimal, and usual care patients, respectively (Figure 1). Follow-up analyses indicated that patients who were prescribed nicotine therapy smoked significantly more cigarettes and reported significantly higher levels of addiction on the modified Fagerstrom Tolerance Questionnaire. [10]

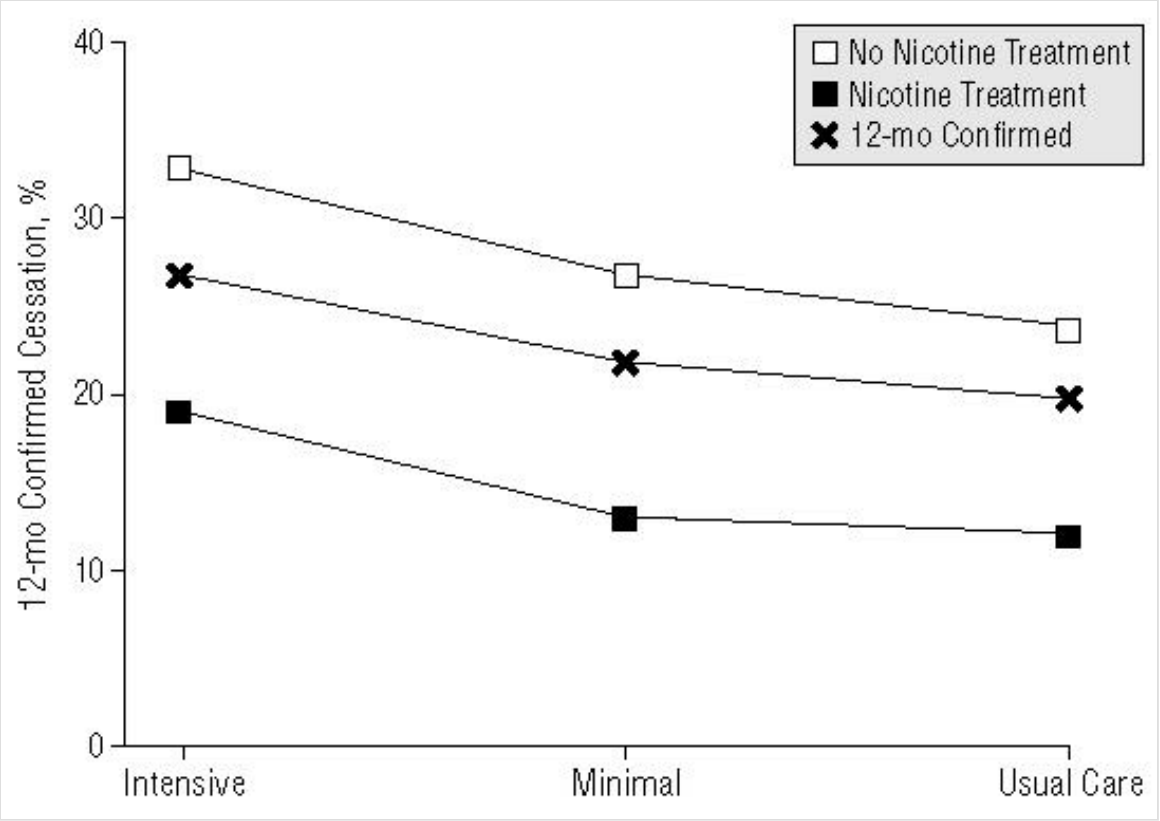

Figure 1. Twelve-month confirmed cessation rates for nicotine replacement therapy vs none.

Among patients who reported that they continued to smoke after discharge, the median number of cigarettes smoked per day was 14 (range, 1-50) at 12 months in the intensive intervention group, 10 (range, 1-40) in the minimal intervention group, and 15 (range, 1-60) in the usual care group. This compares favorably with the median of 20 cigarettes smoked by these patients at baseline (range, 1-100 for intensive intervention; range, 1-80 for minimal intervention and usual care groups).

At the 48-hour postdischarge follow-up telephone call, 74% of the intensive intervention patients and 79% of the minimal intervention patients self-reported not smoking. At this call, 55% of the intervention patients reported that they had received advice from their physicians to quit smoking. No information on physician advice was available from usual care patients, who did not receive a 48-hour follow-up call.

Exploratory analyses were performed to examine cessation rates among patients categorized into 7 discharge diagnoses: cardiovascular, cancer, pulmonary, other internal medicine, surgery, gynecology, and orthopedic conditions. Using a cutoff of 10 patients in each cell of a 2x2 table as a minimally adequate sample size for analysis, 3 diagnostic categories-cardiovascular disease (CVD), pulmonary disease, and other internal medical conditions-exhibited sufficient sample sizes to enable calculation of clinically meaningful ORs. As shown in (Table 2), odds of cessation were greater among patients with CVD and other internal medicine conditions receiving the intensive intervention than among their counterparts receiving usual care (ORs=1.6 and 2.0, respectively). The 95% CIs for the OR indicated that the odds of cessation among patients with CVD or other internal medical conditions receiving the minimal intervention were the same as those receiving usual care. Cessation rates among patients with pulmonary disease were high across all 3 groups, with the 95% CIs for the OR indicating that the odds of cessation were similar regardless of group assignment (Table 2). (Table 2) also shows that substantially more patients with CVD and pulmonary disease reported receiving advice from their physician to quit smoking during hospitalization.

Diagnosis	Percentage (No.) of Patients Who Quit by Treatment and Diagnosis			Odds Ratio (95% Confidence Interval)		Physician Advice, Self-report, %†
	Intensive	Minimal	Usual Care	Intensive vs Usual Care	Minimal vs Usual Care	
Cardiovascular disease	34 (62/182)	28 (38/138)	24 (74/310)	1.6 (1.1-2.5)	1.2 (0.8-2.0)	72
Pulmonary	25 (17/67)	37 (17/46)	35 (40/113)	0.6 (0.3-1.3)	1.1 (0.5-2.3)	77
Other internal medicine	27 (42/157)	19 (26/137)	15 (37/242)	2.0 (1.2-3.4)	1.3 (0.7-2.3)	43
Cancer	28 (7/25)	50 (6/12)	24 (9/37)	...	...	93
Surgery	24 (6/25)	19 (7/37)	14 (10/74)	...	...	41
Gynecological	17 (6/36)	10 (4/40)	14 (10/71)	...	...	23
Orthopedic	10 (4/42)	7 (3/41)	12 (11/89)	...	...	44

*Ellipses indicate not applicable.
†Physician advice refers to the proportion of intervention patients reporting at 48 hours that their physicians provided advice to stop smoking.

Table 2. Odds Ratios by Disease Diagnosis*

COMMENT

In the present study, a multicomponent smoking cessation program consisting of physician advice, nurse-mediated in-hospital counseling, and multiple follow-up telephone contacts significantly increased smoking cessation rates in a general population of hospitalized patients. At 12 months, significantly more patients receiving the intensive intervention with multiple follow-up contacts were confirmed nonsmokers (27%) than those receiving usual care (20%). This 7% difference between intensive intervention and usual care is consistent with the average 5.8% difference between intervention and usual care found in a meta-analysis of 39 randomized clinical trials. [14] The minimal intervention, which provided only a single postdischarge contact, had a 22% cessation rate, which was not significantly different from that observed in the usual care group. The intensive and minimal interventions incorporated the same in-hospital counseling and produced similar cessation rates at 48 hours after discharge (74% and 79%, respectively). Hence, the greater success of the intensive intervention over usual care can be attributed to the additional follow-up telephone contacts provided at 7, 21, and 90 days after discharge.

The cessation rates in the present study are substantially higher than those reported by Stevens et al [8] in the only other study of a general population of hospitalized patients. In that study, in-hospital bedside counseling with a single postdischarge telephone follow-up produced a 12-month smoking cessation rate of 14% compared with 9% among patients receiving usual care. The comparatively higher cessation rates in the present study may reflect to some degree the inclusion of only those patients who intended to quit. We have previously found that patients who expressed little intention to quit rarely did so. Further research is still required to address the needs of this group. [5]

The cessation rate in the intensive intervention group of the present study (27%) is lower than the 71% and 70% cessation rates noted in our previous interventions for patients who had had MIs that also provided in-hospital counseling and multiple postdischarge telephone contacts. [5,6] The major reason for this difference is the nature of the patient population. The present study was conducted in a general hospital population in which approximately 70% of the patients who had had MIs, a group known to have the highest cessation rates, [5,7] were excluded from the study to enable their participation in a concurrent clinical trial. [6] The overall 27% rate in this study is similar to other inpatient and outpatient studies of hospitalized patients that have yielded cessation rates between 13% and 27%, [8,15,16] and the 34% quit rate of patients with CVD in this study is similar to the quit rates documented in other studies of patients with less severe CVD. [7]

The 20% cessation rate found among patients receiving usual care in the present study is twice the 10% reported in the general population [17] and the 9% among usual care patients reported by Stevens et al. [8] The relatively high cessation rates among patients receiving usual care in the present study may have several explanations. First, we enrolled only those patients who stated a willingness to attempt to quit smoking. Second, we standardized usual care by encouraging the provision of physician advice and smoking cessation literature, both of which have been shown to increase cessation rates in routine office visits. [18-20] Third, the cessation rates may have been positively influenced by the relatively high proportion of patients with CVD. This group of patients had a 24% quit rate that is similar to usual care quit rates in other studies of patients with less severe CVD. [7] In comparison, the cessation rate of usual care patients with other internal medicine diagnoses was 15%, which is closer to the 10% annual cessation rate estimated for the general population. [17]

A higher proportion of patients in the intensive intervention group were prescribed nicotine replacement therapy compared with the minimal intervention and usual care groups, which may have increased cessation rates among patients receiving the intensive intervention. However, the effects of the intensive intervention cannot be attributed solely to nicotine replacement therapy. The intensive intervention was also highly efficacious for patients not prescribed nicotine therapy, resulting in a cessation rate of 33% compared with 24% in usual care. In both the intervention and usual care groups, patients prescribed nicotine replacement therapy had lower cessation rates than their counterparts who were not prescribed nicotine therapy. This lower cessation rate may have been due to a self-selection bias. Patients prescribed nicotine replacement therapy were heavier smokers with higher levels of addiction, a group known to have lower cessation rates. [10,16]

To our knowledge, this is the first study to compare cessation rates among different disease categories in hospitalized patients. Our results suggest that cessation may vary by disease diagnosis. The intensive intervention was effective in enhancing quit rates over usual care in all but the pulmonary and orthopedic populations. Patients with CVD and pulmonary disease had the highest overall cessation rates, similar to other studies [21-23] reported in the literature. Gynecologic and orthopedic patients had the lowest quit rates, although the numbers are too small to draw conclusions about these subpopulations. While differing cessation rates exist among disease states, within a population of patients with CVD, different rates of cessation may also exist. [7] These results suggest that stratification by disease category may be important to future studies of hospitalized patients.

Physician advice provided during hospitalization and in outpatient populations has been found to increase smoking cessation rates significantly. [5,7] Accordingly, physicians in the present study were prompted by study staff to provide a simple, scripted, unequivocal message at the bedside to all their patients who smoke. Physicians were more likely to provide advice to patients with CVD and pulmonary disease (75%), which are strongly related to smoking, than to patients with other conditions (44%). This finding is consistent with other studies [24,25] that have found physicians tend to counsel patients with smoking-related diseases. It behooves physicians to take a proactive role in offering strong advice to all hospitalized smokers. However, the burden of counseling need not fall exclusively on the physician. As demonstrated in the present study, specially trained nurses proved efficacious in fostering smoking cessation at 1 year. This reflects in part the opportunity of the nurses to provide multiple telephone encounters after hospital discharge, which physicians are generally unable to do.

Because 33 million Americans are hospitalized annually, the hospital is an important venue for smoking cessation efforts. More than 70% of the smoking population indicate that they would like to quit smoking, yet few seek formal outpatient smoking cessation programs. [26,27] In the hospital, the intervention is brought to the patient's bedside. Moreover, short-term cessation resulting from hospital smoking bans provides an important opportunity to initiate relapse prevention at a time when patients perceive an important threat to their health and are highly motivated to stop smoking.

Strong physician advice at the bedside coupled with nurse-mediated bedside behavioral counseling and telephone follow-up provides an effective model for ensuring that smoking cessation intervention is provided to a broad range of patients. Such programs effectively augment the impact of smoking bans among hospitalized patients and are cost-effective. The absolute cost of the intensive intervention in this study was only $58 per patient (ie, nursing time and self-help materials). In a cost-effectiveness analysis of 1 of our previous studies [5] applying the same intensive intervention, Krumholz et al [28] demonstrated in a 1-way sensitivity analysis that the program would remain cost-effective (<$20 000 per year of life saved) if the program decreased the smoking rate by only 0.3% over usual care (baseline assumption 26%) or if the program costs were as much as $8840 per smoker (baseline assumption $100).

Preventive measures are increasingly being incorporated into the standards used by employers and others to assess the quality of medical care. [29] As managed care organizations set standards for outcomes to assure this quality of care, such models play an increasingly important role in ensuring that preventive services are appropriately delivered.

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Smoking Cessation

IMAGE GALLERY

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Table 2

Table 1

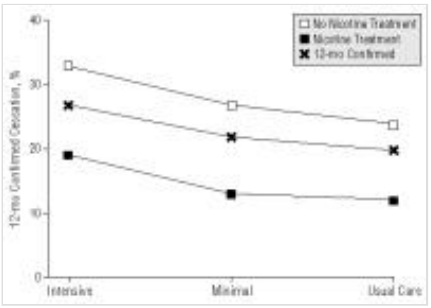

Figure 1

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