FOIA Number: 2008-1524-F

FOIA MARKER

This is not a textual record. This is used as an administrative marker by the William J. Clinton Presidential Library Staff.

Collection/Record Group: Clinton Presidential Records

Subgroup/Office of Origin: Office of Science and Technology Policy

Series/Staff Member: Jerold Mande

Subseries:

OA/ID Number: 13035

FolderID:

Folder Title:
Tobacco Cessation: [Journal Articles and Papers] [2]

Stack:	Row:	Section:	Shelf:	Position:
S	66	4	4	3

Assessing investments in smoking cessation

BY MARILYN DIX SMITH, RPH, PHD AND WILLIAM F. MCGHAN, PHARMD, PHD

Though 46 million adults have quit smoking, an equal number—23 percent of the adult U.S. population—are still puffing away. Smoking remains the most prevalent, modifiable risk factor for increased illness and premature death. The figures are often told but still impressive: In 1990, over 400,000 deaths were linked to smoking. Twelve years of potential life were lost for each death due to smoking. The direct medical costs of smoking were estimated at $50 billion in 1993. Of that, $27 billion went to hospitals, $15.5 billion to physicians and $4.9 billion to nursing homes. Prescription drugs and home health expenditures accounted for the rest.

The indirect cost of lost productivity has been estimated at over $1,000 a year per smoking employee. Only a few published studies have gone beyond these factors to intangible costs of pain and suffering, transfer payments such as sick pay and disability benefits—not to mention lost tax revenues due to reduced earnings—and the costs of the impact on non-smokers, children, infants and fetuses.

How does smoking do all this damage? Suspended on minute particles of tar in tobacco smoke, nicotine is absorbed into the blood almost as fast as if it were injected into a vein. It rapidly enters the brain (thus the "rush" after that first puff, and the quick satisfaction of craving), activating mood, stimulant and depressant receptors. Nicotine is rapidly metabolized. Less than four hours after smoking a cigarette, only 25 percent of the nicotine remains in the body, and craving begins anew.

Nicotine stimulates heart rate and blood pressure and makes blood coagulate more quickly, setting up the well-documented link to cardiovascular disease. As to cancer, nicotine in its natural form does not cause the disease, but when nitrosated in tobacco smoke, it increases the risk of cancer not only of the lungs but also of the larynx, oral cavity and esophagus. Respiratory diseases linked to smoking include bronchitis/emphysema, chronic airway obstruction and pneumonia/influenza.

Even though these risks are well-known, employers, insurers and managed care plans may be reluctant to pay for aggressive cessation or prevention programs. Since years can go by before a smoker

Quit rates and costs

Type of program	Quit rate	Cost
Self-care	15%	$ 26
Nicotine gum	16	105
Nicotine patch only	15	128
Five-day behavioral program	26	148
Group withdrawal clinic	30	148
Nicotine patch and individual counseling	20	203
Nicotine patch and pharmacists' consultation	31	203
Nicotine patch and weekly group counseling	26	276
Nicotine patch, pharmacists' consultation and behavioral program	44	351

Marilyn Dix Smith is vice president of Health Decision Strategies, Princeton, N.J. 800-487-2881. William McGhan is professor, Philadelphia College of Pharmacy and Science. They are, respectively, executive director and president of the Association for Pharmacoeconomics and Outcomes Research.

Smoking cessation resources

Publications, programs and tools	Description	Source
Employee handouts:		
Clearing the air	Booklet on tips for smoking cessation (24 pages)	National Cancer Institute
Don't Let Another Year Go Up In Smoke: Quit Tips	Suggestions on how to quit smoking (1 page)	Office on Smoking and Health
Is Your Baby Smoking?	Materials highlight dangers of passive smoking to infants and children	Office on Smoking and Health
You Can Quit Smoking: Guide for Consumers	Guide offers tips on smoking cessation	AHCPR Publications Clearinghouse
Video programs:		
Smoking & Health	Details lung cancer, emphysema, bronchitis, heart attacks, bladder cancer and strokes	HEALTH EDCO Order #FS46328
Death in the West	Anti-tobacco classic about the true fate of the Marlboro Man	HEALTH EDCO Order #FS45121
Programs for the workplace:		
How to Implement a Smoke-Free Workplace	Notebook advises managers on how to begin a smoking cessation program	HEALTH EDCO Order #FS42003
Pregnant? That's Two Good Reasons to Quit Smoking	Posters highlight the danger of smoking to the fetus	Office on Smoking and Health
Kissing a Smoker	Poster raises the question of social acceptance.	HEALTH EDCO Order #FS89409

develops a related illness, they won't see a quick return on their investment.

Payers have also been reluctant to reimburse for cessation treatment because the failure rate is so high. The reason for that? Nicotine is an addictive substance. Psychological and behavioral aspects of its use meet the same criteria as opiates and cocaine. Smokers are like other addicts in developing tolerance, craving continued use, tending to increase their usage and suffering physical and psychological symptoms upon withdrawal.

Addiction is also the reason successful treatment uses behavioral interventions such as individual or group counseling, self-help programs, acupuncture and hypnosis. These are supported by pharmacologic therapy—low-dose nicotine replacement by gum or transdermal patch to minimize withdrawal symptoms.

Since relapse is so common, it is

Cost
Contact the National Cancer Institute
Free in limited quantities
Free in limited quantities
Free
$86.95
$99.00
$29.95
Free in limited quantities
$12.95

Where to write or call

National Cancer Institute
1-800-4-CANCER

Centers for Disease Control and Prevention
Office on Smoking and Health
Publications Catalog
Mail Stop K-50
4770 Buford Highway, NE
Atlanta, GA 30341-3724
800-CDC-1311

HEALTH EDCO
P.O. Box 21207
Waco, TX 76702-1207
800-299-3366, ext.295

AHCPR Publications Clearinghouse
P.O. Box 8547
Silver Spring, MD 20907-8547
800-358-9295
301-594-2800 (InstantFax)
http://www.ahcpr.gov/

important to measure success rates at least nine months after therapy when comparing programs. The likelihood of relapse is also as important as out-of-pocket cost in estimating the net financial benefit of a program. In the chart shown on page 59, the most expensive therapy—treatment with the nicotine patch combined with consultations with a pharmacist and participation in a comprehensive behavioral program—produced the highest long-term quit rate. It also provides the most cost benefit: For every year (after the first) that a former smoker avoids replapse, his or her employer saves $1,457 in health care costs.

A second pharmacoeconomic method—cost-effectiveness analysis—is more complex, measuring the outlay of dollars against the life-years gained. A cost-effectiveness analysis of smoking cessation advice for men and women ages 35-54 showed a cost per life-year gained of $1,100-$2,900. Nicotine gum and smoking cessation advice showed a cost per life-year gained of $5,800-$13,000. Cessation advice for people who smoke more than one pack per day showed a cost per life-year gained of $9,800, as their quit rate is lower. Cessation advice for pregnant women who smoke or patients hospitalized with a heart attack show a *savings* per life-year gained by preventing low birthweight babies or subsequent hospitalization for heart attack victims.

Beyond dollars spent on treatment, there is a supportive component to smoking cessation that is extremely important. In a clinical guideline released in late April, the federal Agency for Health Care Policy and Research emphasized the role of physicians in raising the issue. AHCPR suggests that physicians ask every patient who smokes to quit, help motivated smokers set a quit date and encourage those who've relapsed to try again. Encouragement from family, friends and, yes, employers is also important in helping smokers quit and keeping nonsmokers from picking up the habit. See pages 60 and 61 for a sampler of literature and posters, including AHCPR's new consumer booklet, that will bolster those efforts.

Note: For a complete list of the studies used in developing this report, please fax your request to the Business & Health *editorial office at 201-358-7252.* □

The Impact of Smoking and Quitting on Health Care Use

Edward H. Wagner, MD, MPH; Susan J. Curry, PhD; Louis Grothaus, MA; Kathleen W. Saunders; Colleen M. McBride, PhD

Background: The magnitude and timing of the impact of effects of smoking cessation on inpatient and outpatient health care use are uncertain.

Methods: Comparison of the use of outpatient and hospital services over time of 2440 persistent smokers and 244 biochemically verified quitters, all of whom were participants in two independent randomized trials of smoking cessation interventions.

Results: Continued smokers in both trials experienced a 7% to 15% increase in outpatient visits and a 30% to 45% increase in hospital admissions over 5 to 6 years of follow-up. The positive slopes approached or reached statistical significance for all use variables in both trial populations. Among quitters, all health care use rates significantly increased during the year in which they quit; after that, the rates declined progressively. By the fourth year after quitting, all use rates among quitters were lower than those for smokers. The increase in hospitalizations during the year of quitting was more often a cause rather than a consequence of successful smoking cessation.

Conclusion: Successful smoking cessation appears to halt the progressive increase in the use of health services associated with continued smoking within a 4-year period.

(Arch Intern Med. 1995;155:1789-1795)

From the Center for Health Studies Group Health Cooperative of Puget Sound, Seattle, Wash.

DESPITE THE extensive evidence about the dire effects of smoking on health[1] and the benefits of cessation,[2] much less is known about the impacts of continued smoking or quitting on health care use. Understanding the effects of smoking status on health care use is essential as policymakers and insurers consider the societal costs of smoking and the inclusion of smoking cessation services in standard health benefit packages.[3] Most evidence about smoking and health care use has come from cross-sectioned studies that identified smokers, ex-smokers, and never smokers by survey and assessed their use of various health care services by self-report or computerized data.[4-9] These studies do not directly evaluate the magnitude and timing of effects of smoking cessation on health care use.

In the most relevant study to date, Vogt and Schweitzer[4] studied the health care use of a cross-sectional sample of never smokers, current smokers, and former smokers at Kaiser-Permanente Northwest Region. While smokers used hospital services more than never smokers, rates of ambulatory care use were similar. Former smokers exhibited a lower rate of hospital use and a higher rate of ambulatory use than did current smokers. Among former smokers, the length of time since quitting was inversely correlated with the hospitalization rate. These data suggest that smoking cessation may influence health care use, but, because former smokers may have quit at any time in the past, the data do not provide a direct answer to the question what happens to health care use after successfully quitting smoking? We examined the use of health services by participants in two randomized trials of smoking cessation interventions to compare the subsequent health service use of successful quitters with that of continuous smokers.

See Subjects and Methods on next page

SUBJECTS AND METHODS

RANDOMIZED TRIALS

Study subjects were participants in two randomized trials that tested different self-help smoking cessation interventions: Free & Clear (F&C)[10] and Breaking Away (BA).[11] Participants for both randomized trials were recruited from among enrollees of the Group Health Cooperative of Puget Sound (GHC), a staff model Health Maintenance Organization (HMO) serving approximately 370 000 enrollees in western Washington state, who reported smoking three or more cigarettes daily. Recruitment for both studies was through articles and/or advertisements in *View* magazine, a GHC publication sent monthly to all enrollees.

FREE & CLEAR

Recruitment and randomization for F&C took place in late 1985 and early 1986. After completion of a baseline survey, 2021 eligible subjects were randomized to one of four groups: self-help manual, self-help manual plus a written guide for a close source of support (eg, spouse, close friend), self-help manual plus social support guide plus brief telephone counseling, and a control condition consisting of a guide to written materials and community resources for smoking cessation.[10] We compared participants with randomly sampled nonparticipating GHC smokers and found the participants to be more likely to be female, older, better educated, heavier smokers, and to have poorer health status than nonparticipants.[12]

We collected follow-up data by mailed questionnaire (with telephone interviews of mail nonrespondents) at 8, 16, and 24 months following randomization. Response rates to the follow-up surveys were 91%, 94%, and 95% for the 8-, 16-, and 24-month surveys, respectively.

The baseline questionnaire obtained sociodemographic data, a detailed smoking and quitting history, measures of mental and physical health, smoking-related symptoms (eg, cough, shortness of breath), and conditions (eg, heart disease, emphysema). Follow-up surveys collected detailed information about current smoking status, quit attempts and their duration, and the use of various interventions to stop smoking. At the 16-month follow-up, all self-reported quitters and a random sample of continued smokers living in Seattle, Wash, were asked to provide a saliva sample for assessment of cotinine, thiocyanate, or both; 87% agreed.

We defined *quitting* as abstinence from smoking for at least 7 days at the time of survey. For the purpose of this analysis, F&C quitters are individuals who reported abstinence for 7 or more days on each of the three follow-up surveys (n=176). The F&C continued smokers are those reporting current cigarette smoking on each of the three follow-up surveys (n=1487). We excluded from this analysis those who reported various combinations of smoking and quitting on the three follow-up interviews (n=335) and those who could not respond to a follow-up survey because of death or serious illness (n=23). Ninety-eight percent of reported quitters who were tested at 16 months had their self-reports confirmed by biochemical testing.

The overall 7-day abstinence rates in the study population were 17%, 18%, and 21% at 8, 16, and 24 months, respectively, and 9% reported abstinence on all three surveys. Only in the group receiving all interventions, including telephone counseling, did the abstinence rates significantly exceed those of the control group.

BREAKING AWAY

Breaking Away also was a randomized, controlled clinical trial examining self-help smoking cessation strategies. During 1987, 1217 smokers returned completed questionnaires and consent forms and were randomly assigned to one of four treatment groups. Subjects in all four groups received a self-help manual for smoking cessation. In addition, subjects were randomly assigned to receive personalized motivational feedback based on responses to the baseline questionnaire, prizes for using the self-help program, both, or neither.[11] Data were collected at baseline and 3 and 12 months after enrollment. We collected follow-up data on 98% and 95% of the subjects at 3 and 12 months, respectively.

Baseline data included sociodemographic character-

RESULTS

CHARACTERISTICS OF SMOKERS AND QUITTERS

Table 1 compares the characteristics of the continuous quitters with those smokers who continued to smoke throughout follow-up. On average, study subjects were in their mid-40s, more likely to be female, and symptomatic. Participants in the two studies were remarkably similar.

Quitters reported higher incomes than smokers ($P=.06$ in F&C; $P=.003$ in BA), but otherwise were similar demographically. As measured by the chronic disease score,[14] quitters and smokers had equivalent prevalences of treated chronic illnesses but continued smokers reported significantly more smoking-related symptoms at baseline. This may be related to the fact that they smoked significantly more cigarettes per day than did eventual quitters.

CHANGES IN OUTPATIENT HEALTH CARE USE

Figure 1 shows mean outpatient visits in the year prior to randomization and during the follow-up periods for quitters and smokers in each study. The patterns over time among smokers and quitters in the two studies are similar. Prior to randomization, participants in both studies visited their physicians between four and five times a year. Visit rates did not differ between quitters and smokers during the baseline year in either study (**Table 2**). During the year in which they quit smoking, quitters increased their average outpatient service use by nearly two visits, while the use of the continued smokers remained largely unchanged. Table 2 shows that the differences between smokers and quit-

istics, smoking and quitting history, health, lifestyle, and social support. Follow-up surveys queried smoking status, quit attempts and their duration, and the use of various interventions. We attempted to obtain data on salivary cotinine levels in all self-reported quitters in the Seattle area at 12 months; 82% provided specimens.

As with F&C, we defined *cessation* as 7 or more days without a cigarette at the time of survey. Quitters (n=68) in this analysis include those reporting abstinence at both 3 and 12 months, while smokers (n=953) reported smoking on both follow-up surveys. Of those self-reported quitters tested with salivary cotinine at 12 months, 95% were confirmatory.

Overall 7-day cessation rates for the entire study population were 10% and 14% at 3 and 12 months, respectively, and 6% were abstinent on both surveys. Only the group receiving personalized feedback alone experienced significantly higher quit rates.

DATA ON HEALTH CARE USE

The GHC has maintained computerized data on hospitalizations since 1972, and on outpatient care since 1984. Computerized data on health service use outside of GHC's hospitals and clinics have been available since the early 1980s from claim-based data systems. The reliability and validity of data extracted from these systems have been described.[13] For this analysis, outpatient visits comprise all visits to primary or specialty care, including visits to physician's assistants, nurse practitioners, and mental health workers. We excluded visits for ancillary services such as physical therapy or dietary counseling. Hospitalizations include short-stay or ambulatory surgery admissions. Short-stay admissions are counted in admission rates, but contribute no hospital days.

For each subject, health service use for a given year begins with their date of randomization. To compare the chronic disease burden between smokers and quitters, we computed the chronic disease score, a measure derived from computerized pharmacy data reflecting the number and severity of chronic conditions. The score has been shown to be highly predictive of death, hospitalization, and ambulatory use in a variety of GHC study populations.[14]

ANALYSIS

The first analysis compared baseline characteristics of continued smokers and quitters using χ^2 statistics for categorical variables and Student's t tests for continuous variables.

We next compared three variables between smokers and quitters: outpatient visits, hospital admissions, and hospital days. The distributions of these variables were all nonnormal, and all further analyses examined untransformed and transformed (log and square-root transformations) data. We first compared unadjusted rates of health care use in the year preceding randomization (baseline) using Student's t tests on appropriately transformed data. The analyses were repeated controlling for baseline variables using analysis of covariance. These control variables included age, gender, race, education and income, marital status, self-evaluated health status, symptoms associated with smoking (cough, shortness of breath, chest pain), chronic conditions, depression, body mass index, alcohol consumption, and exercise habits. We then compared changes in health service use of smokers and quitters between the baseline year and the year following randomization using Student's t tests and analyses of covariance.

Temporal trends in health service use following randomization were examined using ordinary least squares regression with and without adjustment for baseline characteristics. The analyses were run several ways to examine the impacts of within-person correlation in health service use and unavailability for follow-up. The impact of autocorrelation was assessed by performing both simple and repeated measures linear regression analyses. The P values changed little, and the results of the adjusted simple regressions are presented below. We also compared analyses limited to those subjects who remained with GHC throughout the period including the baseline year and full follow-up period (58% of the full cohort) to a person-years analysis, including all subjects at risk for a given period. Again, the results were nearly identical and the data presented pertain to those individuals remaining in GHC for the duration of follow-up.

ters were significant in both studies. In subsequent years, visit rates progressively declined among quitters and slowly increased among smokers. We examined the slopes of visit rates during the follow-up periods. In both studies, the slopes after adjustment for baseline covariates were positive for smokers (P=.11 in F&C; P=.02 in BA) and negative for quitters (P=.003 in F&C, P=.35 in BA). In both study populations, the visit rates cross in the fourth year after the quitters succeeded in abstaining from cigarettes.

CHANGES IN HOSPITALIZATION

Figure 2 depicts temporal trends in annual hospital admission rates for quitters and smokers in the two trials. Again, the patterns are very similar across studies but remarkably different for smokers and quitters. Admission rates for smokers, like visit rates, rose slowly and steadily over time. Quitters experienced much lower admission rates in the year prior to randomization, a sharp increase during the year they stopped smoking, followed by a decline. The admission rates of quitters fell below those of continued smokers within 4 years of cessation.

The differences in adjusted admission rates between quitters and smokers at baseline did not reach statistical significance in either study population (**Table 3**). The increase in admission rates in the year following randomization was significant for F&C quitters (P=.004), but not for BA quitters (P=.35). The adjusted slopes of the annual admission rates throughout the follow-up periods were positive for smokers in both trials (P=.08 in F&C; P=.01 in BA), negative in F&C quitters (P=.02), and close to zero in BA quitters.

The temporal trends in hospital days resemble those seen with admission rates except for greater year-to-

Table 1. Baseline Characteristics of Continuous Smokers and Quitters in Free & Clear and Breaking Away Trials

Variables	Free & Clear			Breaking Away		
	Smokers	Quitters	*P*	Smokers	Quitters	*P*
n	1487	176		953	68	
Demographic data						
Mean age, y	44.1	44.8	.51	44.5	42.4	.21
Female, %	63	59	.26	64	66	.71
White, %	94	95	.42	94	96	.52
Income >$35 000, %	29	36	.06	31	48	.003
Health status, self-reported						
Fair or poor, %	25	29	.37	24	26	.64
Chronic disease score	0.71	0.55	.20	0.73	0.41	.10
Cough, %	40	37	.40	42	29	.04
Dyspnea, %	44	38	.11	42	35	.26
Chest pain, %	30	19	.01	27	17	.06
Health behaviors						
No. of cigarettes per day	26.1	24.3	.05	26.6	21.3	.001
Regular exercise program,*	14	13	.88	17	19	.61
Alcohol use,†%	86	81	.05	82	88	.20

**Exercise three times a week or more for 15 minutes or more.*
†Alcohol consumption in past 12 months.

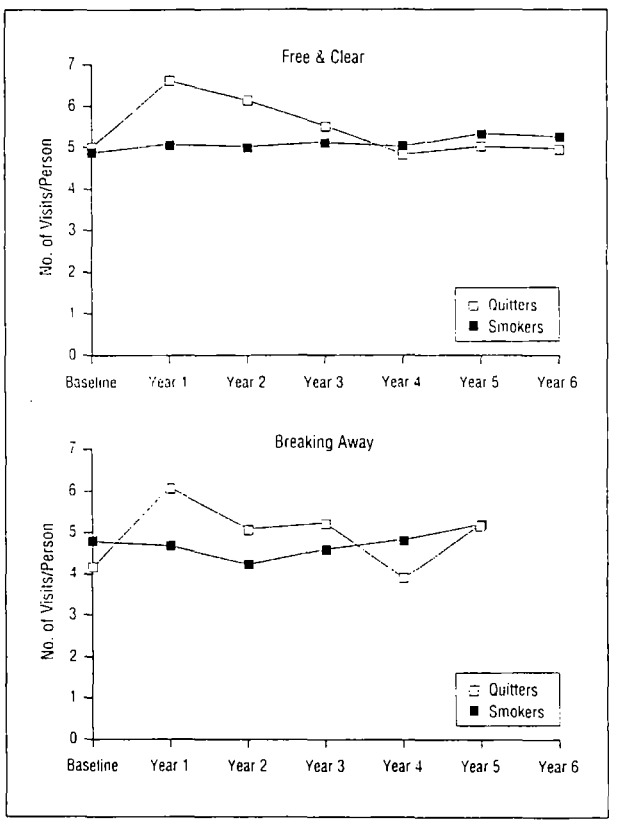


Figure 1. *Annual outpatient visits among smokers and quitters by year.*

Table 2. Outpatient Visits in Smokers and Quitters*

Variable	Rate	*P*
Free & Clear Trial		
Baseline visit rate†		
Smoker	4.73	. . .
Quitter	5.21	. . .
Difference‡	−0.48	.31
Change in visit rate† from baseline to year 1		
Smoker	0.11	.50
Quitter	1.68	<.001
Difference‡	−1.57	.002
Annual change in visit rates,† years 1-6		
Smoker	0.069	.11
Quitter	−0.361	.003
Difference‡	0.430	<.001
Breaking Away Trial		
Baseline visit rate†		
Smoker	4.64	. . .
Quitter	4.34	. . .
Difference‡	0.30	.63
Change in visit rate† from baseline to year 1		
Smoker	−0.07	.72
Quitter	1.64	.02
Difference‡	−1.71	.02
Annual change in visit rates,† years 1-6		
Smoker	0.136	.02
Quitter	−0.189	.35
Difference‡	0.325	.12

**Estimates and P values adjusted for baseline covariates.*
†Visits per person per year.
‡Difference indicates smoker rate minus quitter rate.

year variability (**Figure 3**), particularly for the BA quitters for whom there were very few admissions (four to 11 per year, with a sizable proportion being same-day admissions). Thus, the hospital days for the BA quitters have very large standard errors.

Analyses of hospital days among smokers and quitters (**Table 4**) revealed findings similar to those with admission rates. Quitters spent fewer days in the hospital in the year prior to randomization than did continued smokers, but the differences were not significant in either study. In the year following entry into the study, the number of mean hospital days increased significantly among F&C quitters and remained unchanged

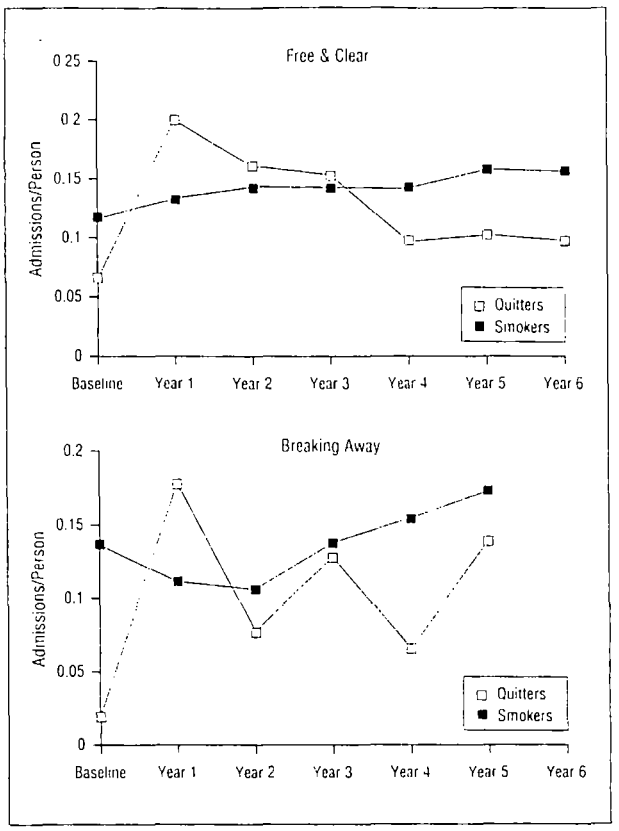


Figure 2. *Annual hospital admissions among smokers and quitters by year.*

among smokers. Over the ensuing follow-up interval, the number of mean hospital days increased significantly among smokers in both studies and declined significantly among F&C quitters.

SMOKING STATUS AT THE FIRST HOSPITALIZATION FOLLOWING RANDOMIZATION

We reviewed the medical records of all F&C quitters admitted to the hospital in the year after randomization (n=24) as well as a random sample of 20 admissions among F&C smokers. The purpose of the review was to ascertain quit status at the time of admission and whether the admission might be related to smoking cessation. The diagnoses in both groups were heterogeneous. Among quitters, 48% were smoking at the time of admission, 13% had quit within 1 month of admission, and 39% had quit longer ago. In only one chart did we find any mention of nicotine withdrawal symptoms, but in this case the primary diagnosis was displaced lumbar disk. Three patients were readmitted during the year. The patient with the disk and possible nicotine withdrawal symptoms was readmitted 2 weeks later for treatment of his disk, at which time he reported not smoking for 3 weeks. Another patient, smoking two packs per day, was admitted for asthma. She was readmitted 3 weeks later, also for asthma, and reported having recently quit. The records of 85% of the continuous smokers mentioned smoking at the time of admission.

Table 3. Hospital Admission Rates in Smokers and Quitters*

Variable	Rate	*P*
Free & Clear Trial		
Baseline admission rate†		
Smoker	0.109	...
Quitter	0.067	...
Difference‡	0.042	.19
Change in admission rate† from baseline to year 1		
Smoker	0.004	.81
Quitter	0.142	.004
Difference‡	−0.138	.04
Annual change in admission rates,† years 1-6		
Smoker	0.006	08
Quitter	−0.023	02
Difference‡	0.029	.006
Breaking Away Trial		
Baseline admission rate†		
Smoker	0.141	...
Quitter	0.048	...
Difference‡	0.093	.19
Change in admission rate† from baseline to year 1		
Smoker	−0.023	.33
Quitter	0.081	.35
Difference‡	−0.103	.25
Annual change in admission rates,† years 1-5		
Smoker	0.014	.01
Quitter	−0.002	.91
Difference‡	0.016	.43

*Estimates and P values adjusted for baseline covariates
†Hospital admissions per person per year.
‡Difference indicates smoker rate minus quitter rate.

COMMENT

These data show, on the one hand, that continued smoking by HMO enrollees is associated with a steady increase in inpatient and outpatient service use over a relatively short period of time. After 5 years, continued smokers experienced a 7% to 15% increase in outpatient visits, a 30% to 45% increase in hospital admissions, and a 75% to 100% increase in hospital days. On the other hand, documented smoking cessation is preceded and followed by a complex pattern of health service use. This pattern is characterized by a reduction in hospital use prior to quitting, an increase in outpatient and inpatient service use in the year of cessation followed by a decline to levels lower than those for smokers. This pattern occurred in two independent samples of proven quitters. Although the number of quitters in the two studies numbered less than 250, the similarities in the service use patterns in the two groups increase the likelihood that this pattern is not a chance finding. Quitters had lower rates of service use 2 to 4 years after cessation for all service use variables studied. Adjustment in the analysis for health status, symptoms, chronic diseases, or other behaviors makes it unlikely that differences in baseline health or lifestyle between

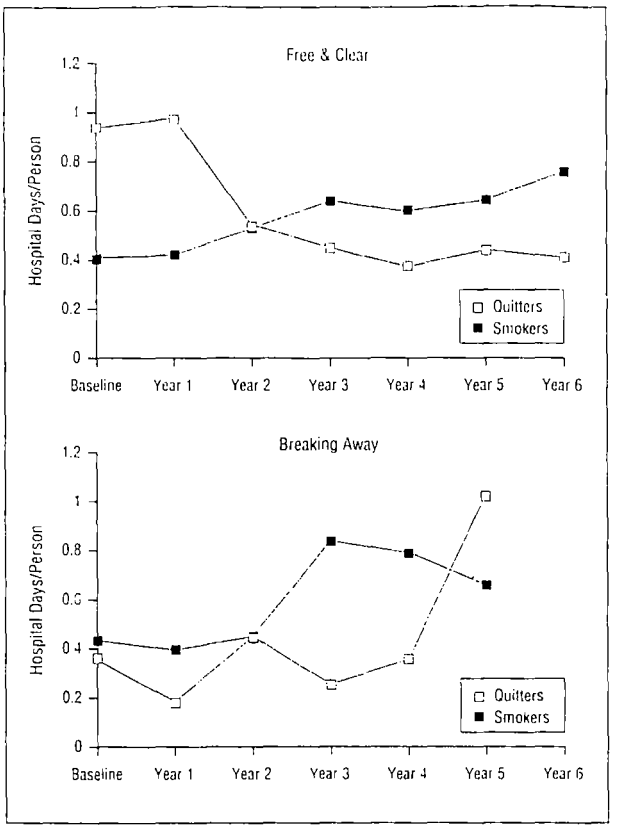


Figure 3. *Annual hospital days among smokers and quitters by year.*

Table 4. Hospital Days in Smokers and Quitters*

Variable	Rate	*P*
Free & Clear Trial		
Baseline hospital days†		
Smoker	0.366	. . .
Quitter	0.150	. . .
Difference‡	0.216	.21
Change in hospital days† from baseline to year 1		
Smoker	0.035	.69
Quitter	0.953	<.001
Difference‡	−0.918	.001
Annual change in hospital days,† years 1-6		
Smoker	0.073	.003
Quitter	−0.143	04
Difference‡	0.216	.003
Breaking Away Trial		
Baseline hospital days†		
Smoker	0.439	. . .
Quitter	0.081	. . .
Difference‡	0.358	.26
Change in hospital days† from baseline to year 1		
Smoker	−0.032	.74
Quitter	0.287	.43
Difference‡	−0.319	.40
Annual change in hospital days,† years 1-6		
Smoker	0.090	.03
Quitter	−0.056	.70
Difference‡	0.146	.34

**Estimates and P values adjusted for baseline covariates.*
†Hospital days per person per year.
‡Difference indicates smoker rate minus quitter rate

eventual smokers and quitters accounted for the differences in service use.

Two other HMO-based studies have found outpatient service use over a time interval to be higher among former smokers than among smokers,[4,5] but neither study reported temporal trends or the relationship to quitting. Vogt and Schweitzer[4] found that the hospital service use of former smokers over an 8-year period was higher than that of never smokers, but lower than that of current smokers.[4] Of relevance to our findings, hospital discharges declined among former smokers as the time since quitting increased. This finding led the authors of the Surgeon General's report,[2] to conclude that "former smokers experienced a brief period of increased use of hospital services just after quitting followed by declines in use to levels of never smokers."[2] This conclusion assumes that quitting precedes and, perhaps, precipitates illness that requires hospitalization. If quitting leads to increased outpatient service use and hospitalization because of psychologic or physiologic effects of the cessation process, these additional costs must be subtracted from the long-term cost savings associated with cessation. Because this additional cost is high (150 to 200 extra physician visits and five to 10 added hospitalizations for every 100 quitters), it is important to clarify the nature of the association.

We examined the hospital diagnoses and temporal relationships between quitting and hospitalization among the 24 quitters hospitalized in the year of their behavior change. We considered several hypotheses to explain the pattern of use in the successful quitters. First, since quitting is associated with pharmacologic and psychologic withdrawal symptoms, these may have precipitated an admission. We found only one patient record that approximated this scenario, ie, a patient admitted for an exacerbation of asthma that followed smoking cessation. Second, a frightening diagnosis may have led to both hospitalization and motivated quitting. Among those quitters who had quit prior to their hospitalization, five had been diagnosed with malignancies or cardiac disease and were then hospitalized for the illness. Third, hospitalization may have provided motivation and an opportunity to quit smoking. This sequence of events has been described in the literature[15-18] and is the basis for the recent impetus to aggressively pursue smoking cessation among hospitalized patients.[19] Half of our quitters were smoking at the time of their hospitalization in the year they quit. Two of the three quitters admitted twice in the year after randomization were smoking at the time of their first admission. Both were readmitted 2 to 3 weeks later, at which time they had reported quitting recently.

Do any of these explanations account for the lower hospitalization rates among quitters in the year prior to their successful involvement in the interventions? Although quitters were somewhat healthier (Table 1) than continued smokers, hospitalization rates in the year prior to the baseline year (ie, 12 to 24 months prior to randomization) were no different between subsequent quit-

ters and smokers (data not shown). If hospitalization or the conditions leading to hospitalization provide an important opportunity to quit, motivated smokers who experienced an illness or hospitalization prior to our recruitment efforts may have already successfully stopped smoking. If so, then the remaining pool of smokers who are ready to quit and have not done so (ie, those available to volunteer for a cessation intervention study and likely to successfully quit) may be less likely to have been recently hospitalized.

Our data strongly suggest that the increased hospital use around the time of smoking cessation is either directly or indirectly (because of a frightening diagnosis) associated with increased motivation to stop smoking rather than a consequence of stopping. Although we have no direct evidence, we suspect that the same explanation may account for some of the increased outpatient service use during the same year. If this explanation is correct, this excess use should not be considered an added cost of smoking cessation and significant health care cost savings from smoking cessation should be achievable in a very few years.

This analysis has several advantages over prior studies of smoking cessation and health care use, as well as limitations. The advantages relate to the fact that the smokers studied were participants in two smoking cessation trials based in the same HMO. First, we know the approximate date of quitting, which allows us to examine the association between quitting and service use over time. Second, because of biochemical verification of quitting and the use of computer data on health service use, we are able to accurately and objectively document smoking status and service use over time. Third, having data from two trials with different populations of smokers allowed us to examine the consistency of the associations between smoking status and health care use. They were, in fact, remarkably consistent across the two studies.

The major potential limitations of this analysis are the limited number of quitters and the restriction of smokers to HMO enrollees who volunteered for smoking cessation studies. While the relatively small numbers of quitters contributed to instability in the rates, particularly among the BA participants, the major findings were in the same direction and either reached or approached statistical significance in one or both study populations.

In summary, our data show that smoking cessation is associated with an initial rise and subsequent decline in hospitalization and outpatient visit rates. A review of hospital records suggests that the increased number of hospitalizations is more likely the *cause* rather than the *effect* of smoking cessation. Within 4 to 5 years after cessation, quitters return to their baseline levels of health care use or lower, while continued smokers experience a steady increase in physician visits and hospitalizations over time. Over a 5-year period, these relatively young smokers (average age, 44 years) increased their doctor visits by approximately 10% and their hospital admissions by approximately 30%. Successful quitting appears to stop the increase and may even be associated with a decline in admissions compared with baseline levels of health care use. The cost savings from reduced use would more than pay for moderately priced, effective smoking cessation interventions in a matter of 3 or 4 years. Including pharmacologic and behavioral smoking cessation treatment in standard benefit plans would appear to be both a wise public health and a financial investment.

Accepted for publication February 23, 1995.

This study was supported in part by National Cancer Institute grant CA-38223, National Institute of Drug Abuse grant DA-04447, and a grant from Marion Merrill-Dow, Kansas City, Mo.

Reprint requests to Center for Health Studies, Group Health Cooperative, Metropolitan Park East Bldg, Suite 1600, 1730 Minor Ave, Seattle, WA 98101 (Dr Wagner).

REFERENCES

1. Bartecchi CE, MacKenzie TD, Schrier RW. The human costs of tobacco use. *N Engl J Med.* 1994;330:907-912
2. Department of Health and Human Services. *The Health Benefits of Smoking Cessation: A Report of the Surgeon General.* Rockville, Md: Dept of Health and Human Services; 1990. Dept of Health and Human Services publication (CDC) 90-8416.
3. Parkinson MD, Schauffler HH, Kottke TE, et al. Report of the tobacco policy research study group on reimbursement and insurance in the United States. *Tobacco Control.* 1992;1(suppl):S52-S56.
4. Vogt TM, Schweitzer SO. Medical costs of cigarette smoking in a health maintenance organization. *Am J Epidemiol.* 1985;122:1060-1066.
5. Oakes TW, Friedman GD, Seltzer CC, Siegelaub AB, Collen MF. Health service utilization by smokers and nonsmokers. *Med Care.* 1974;12:958-966.
6. Ashford JR. Smoking and the use of the health services. *Br J Prev Soc Med.* 1973;27:8-17.
7. Newcomb MD, Bentler PM. The impact of late adolescent substance use on young adult health status and utilization of health services: a structural equation model over four years. *Soc Sci Med.* 1987;24:71-82.
8. Kaplan RM, Wingard DL, McPhillips JB, Williams-Jones D, Barrett-Connor E. Cigarette smoking, mortality, institutional and community-based care utilization in an adult community. *J Commun Health.* 1992;17:53-60.
9. Marsden ME, Bray RM, Herbold JR. Substance use and health among US military personnel: findings from the 1985 worldwide survey. *Prev Med.* 1988;17:366-376.
10. Orleans CT, Schoenbach VJ, Wagner EH, et al. Self-help quit smoking interventions: effects of self-help materials, social support instructions, and telephone counseling. *J Consult Clin Psychol.* 1991;59:439-448.
11. Curry SJ, Wagner EH, Grothaus LC. Evaluation of intrinsic and extrinsic motivation interventions with a self-help smoking cessation program. *J Consult Clin Psychol.* 1991;59:318-324.
12. Wagner EH, Schoenbach VJ, Orleans TC, et al. Participation in a smoking cessation program: a population-based perspective. *Am J Prev Med.* 1990;6:258-266.
13. Saunders K, Stergachis A, Von Korff M. Group Health Cooperative of Puget Sound. In: Strom BL, ed. *Pharmacoepidemiology.* 2nd ed. Chichester, England: John Wiley & Sons; 1994:171-185.
14. Von Korff M, Wagner EH, Saunders K. A chronic disease score from automated pharmacy data. *J Clin Epidemiol.* 1992;45:197-203
15. Glasgow RE, Stevens VJ, Vogt TM, Mullooly JP, Lichtenstein E. Changes in smoking associated with hospitalization: quit rates, predictive variables and intervention implications. *Am J Health Promotion.* 1991;6:24-29.
16. Kabat GC, Wynder EL. Determinants of quitting smoking. *Am J Public Health.* 1987;77:1301-1305.
17. Orleans CT, Rotberg HL, Quade D, Lees P. A hospital quit-smoking consult service: clinical report and intervention guidelines. *Prev Med.* 1990;19:198-212.
18. Daughton DM, Fix AJ, Kass I, Patil KD. Smoking cessation among patients with chronic obstructive pulmonary disease (COPD). *Addict Behav.* 1980;5:125-128.
19. Stevens VJ, Glasgow RE, Hollis JF, Lichtenstein E, Vogt TM. A smoking-cessation intervention for hospital patients. *Med Care.* 1993;31:65-72.

Quitting Smoking in the United States in 1986

Evridiki J. Hatziandreu, John P. Pierce, Myrto Lefkopoulou, Michael C. Fiore, Sherry L. Mills, Thomas E. Novotny, Gary A. Giovino, Ronald M. Davis*

In an analysis of recent behavior with regard to quitting smoking, detailed histories were obtained on a representative sample of 5,623 Americans who had smoked in the year preceding the 1986 Adult Use of Tobacco Survey. An estimated 55.8 million Americans smoked regularly for some period during the year prior to the survey. Approximately one third (34.8%) quit for at least a day during the year prior to the survey, 28.3% quit for at least 7 days during the year prior to the survey, and 16.2% were still not smoking at the time of the survey. Of those who quit for a day, 54% had relapsed by the time of the survey. Demographic characteristics, such as age, sex, race, marital status, and education, were evaluated as predictors of making a major attempt to quit for 7 days or more. Among those who had made a major attempt, a similar analysis was done predicting success in maintaining cessation for 3 months or more. Ordinal logistic regression analyses showed that younger age and higher education predicted a major attempt to quit. There was only one group who differed markedly from all others: those who were younger and were more highly educated. Older age and being white predicted those who abstained for 3 months or longer. [J Natl Cancer Inst 82:1402–1406, 1990]

Smoking prevalence in the United States has been decreasing since the early 1960s (*1*); since 1974, this decline has occurred at a constant rate of about 0.5 percentage points per year (*2*). If this constant rate continues, the number of adult smokers in the United States in the year 2000 will be approximately 42 million (*3*), a number not substantially lower than the 48 million smokers noted in 1985.

In 1985, there were an estimated 390,000 smoking-attributable deaths and many more cases of smoking-related morbidity in the United States (*1*). Even if the current success in reducing smoking prevalence continues, there will be only a small reduction in the

Received November 13, 1989; revised June 15, 1990; accepted June 21, 1990.

E. J. Hatziandreu, J. P. Pierce, S. L. Mills, T. E. Novotny, G. A. Giovino, R. M. Davis, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control, Atlanta, Ga.

M. Lefkopoulou, Department of Biostatistics, Harvard School of Public Health, Boston, Mass.

M. C. Fiore, Department of Medicine, University of Wisconsin, Madison, Wis.

**Correspondence to:* Gary A. Giovino, Ph.D., Epidemiology Branch, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control, 5600 Fishers Ln., Rm. 1–16, Rockville, MD 20857.

number of smoking-related health events by the year 2000. Further, the pattern of these health events will change; they will occur increasingly more often among women, blacks, and the less educated (*2,4*).

Despite the substantial progress of the last 25 years in the reduction of smoking, the United States is still far from a smoke-free society. To reduce smoking prevalence further will require either a reduction in the rate of smoking initiation or an increase in the rate of smoking cessation.

Usually, smoking cessation is measured in surveys by a current smoking status question, which divides the population into current, former, and never smokers. Cessation is indicated by the number of former smokers or the ratio of former smokers to ever smokers (quit ratio) (*5*). These measures of smoking cessation are both point prevalences. However, smoking cessation is not a single-step, all-or-none process; rather, it is a dynamic process. In a pattern similar to that observed among heroin addicts and alcoholics, smokers who quit often relapse to become smokers again (*6*). Like cessation of other drugs of addiction, cessation of cigarette smoking is associated with withdrawal symptoms whose occurrence and strength are related to the likelihood of relapse. Public health efforts to assist smokers to quit often concentrate on increasing the smokers' motivation or on increasing their skills in maintaining cessation and avoiding relapse. The appropriate distribution of resources among those different approaches requires answers to the following questions: Who is trying to quit, and who is successfully maintaining cessation?

Using a large, nationally representative survey conducted in 1986, this article describes the sociodemographic differences among the population of smokers who made a major attempt to quit smoking in the year prior to the survey as well as among those who were able to abstain from smoking for at least 3 months and were still abstinent at the time of the survey. The objective of our analysis was to describe the dimensions of the quitting process in the United States. By identifying those groups of smokers at various stages of the quitting process, we hope to stimulate studies and interventions to improve the likelihood of successful smoking cessation.

Subjects and Methods

In 1986, Westat, Inc. (Rockville, Md), conducted a detailed survey (i.e., the Adult Use of Tobacco Survey) for the Office on Smoking and Health on 13,031 members of the adult (≥17 yr old), noninstitutionalized population of the United States. The complex sampling process has been described in detail elsewhere (*7*). The process involved a screening survey of 36,405 households obtained by random-digit dialing to clusters of between 10 and 15 households from a random sample of telephone exchanges in the United States. A stratified random sampling procedure was used to select participants from this screening survey to provide an approximately equal proportion of respondents in each smoking category (current, former, or never). The response rate was 85.5% to the screening survey and 86.9% from the selected individuals, the product of which gives an overall response rate of 74.3% (n = 13,031). The survey was weighted to control for sample design and to ensure representativeness according to geographic region, education, race, sex, and age.

Smoking status (current, former, or never) was obtained from responses to the following two standard questions used to define smoking status in the United States: 1) Have you smoked at least 100 cigarettes in your life? 2) Do you smoke cigarettes now?

Smoking cessation is not defined by former smoking status but rather by history of quitting smoking over the past year. In accord with the National Working Conference on Smoking Relapse (*8*), smoking cessation is defined as abstinence for at least 1 day. However, a more interesting variable in terms of describing the quitting process is a "major quit attempt," defined as at least 7 days of abstinence. The clinical programs studied by Hunt et al. (*6*) suggest that a high proportion of those who relapse will do so in this 1st week. We chose to model those people who made it through the crucial 1st week. The same data also suggest that the majority of relapses will occur within 3 months after smoking cessation.

Quitting history of former smokers was obtained by asking them the following question: Approximately how long ago did you stop smoking cigarettes? Quitting history of current smokers was obtained by asking them the following three questions: 1) Have you ever made a serious attempt to stop smoking cigarettes entirely? 2) Just thinking of the last time, how long did you stay off cigarettes? 3) How long ago did that (LENGTH OF TIME) period begin?

Of the 13,031 persons included in the survey, 5,623 (4,700 current smokers and 923 former smokers who had abstained for <1 yr) reported smoking regularly at some point within the 12 months preceding the survey and are the focus of this article. The quitting history during the 12 months prior to the survey of these persons was categorized into the following five subgroups: 1) long-term quitters (abstinence for 3–12 mo), 2) short-term quitters (abstinence for <3 mo), 3) current smokers (quit attempt lasted ≥7 days before relapse), 4) current smokers (quit attempt lasted from 1 to 6 days), and 5) current smokers (no attempt reported in last 12 mo).

Analysis

First, a weighted sample was used to report the population estimates for each subgroup of quitting history. Then the unweighted sample was used to perform multivariate analyses to identify sociodemographic predictors of a major quit attempt (defined as an attempt resulting in abstinence for ≥7 days) within the past year and of maintenance (defined as abstinence for at least 3 mo). This latter multivariate analysis did not consider former smokers who have maintained their quit attempt for less than 3 months, as their success was considered uncertain.

Multivariate logistic regression analyses were performed for these two outcome variables using BMDP statistical software (*9*). The sociodemographic variables included in the models were sex, race (white or black), education (≤11 yr, 12 yr, 13–15 yr, and 16+ yr), marital status (married or cohabitating, widowed, divorced or separated, and never married), and age. Age was first used as a continuous variable, and its relationship to the quitting history was investigated for a linear term as well as higher order terms. This analysis suggested that categorization of age would not introduce a bias; therefore, for purposes of interpretation, age was also analyzed in four categories (17–24, 25–44, 45–64, and

65+ yr). Because of sample size considerations within the analysis of 3-month maintenance, the marital status categories of divorced or separated and widowed were combined.

A stepwise approach to modeling the data was used (*10*). First, models were fitted that contained only the main effects of the independent variables. The likelihood ratio test was used to assess the effect of removal of every variable from the model. Variables with a P value larger than .10 were dropped from the model. All two-way interactions of the remaining factors were added, and the same step-down procedure was used. We assessed the goodness of fit of this parsimonious model by comparing it with the model with all main effects and all two-way interactions, using the likelihood ratio test and the goodness-of-fit test of Hosmer and Lemeshow (*11*). Results are reported using odds ratios and their 95% confidence intervals (CIs). Statistically significant ($P < .05$) effects occur when these CIs do not span 1.0.

Results

History of Quitting Smoking in the United States

Weighted data from the survey were used to provide population estimates for the United States on recent quitting history (table 1). An estimated 55.8 million Americans 17 years and older smoked regularly at some time during the past year; however, 9.0 million of these (16.2%) were not smoking at the time of the survey (categories 1 and 2). During the 1-year period, 19.4 million (34.8%) quit smoking for at least 1 day (categories 1–4). However, 54% of those who quit for at least a day had relapsed by the time of the survey (categories 3 + 4/categories 1 + 2 + 3 + 4); 6.8 million (12.2% of all smokers in the last yr) remained abstinent for 7 or more days before relapsing. Another 3.6 million (6.4% of all smokers) had been abstinent for at least 3 months at the time of the survey. Overall, 15.8 million (28.3% of all those who smoked in the last yr) quit for 7 or more days. Of those who had made this major quit attempt and were still abstinent at the time of the survey, 22.5% of those eligible had maintained cessation for at least 3 months.

Table 1. History of quitting smoking in the United States*

Category	% of smokers in last yr	Estimate of US population (millions)
1) Long-term quitters (abstinence for 3–12 mo)	6.4	3.56
2) Short-term quitters (abstinence for <3 mo)	9.8	5.46
3) Current smokers (quit attempt lasted ≥7 days before relapse)	12.2	6.79
4) Current smokers (quit attempt lasted from 1 to 6 days)	6.4	3.59
5) Current smokers (no attempt reported in last 12 mo)	65.2	36.42
6) Proportion with major quit attempt (categories 1 + 2 + 3/ categories 1 + 2 + 3 + 4 + 5)	28.3	15.81
7) Proportion who succeeded for at least 3 mo (category 1/categories 1 + 2 + 3)	22.5	3.56
Total	100	55.83

*Data from Adult Use of Tobacco Survey, 1986.

Table 2. Sociodemographic predictors of a major quit attempt* in the last 12 mo: main effects model†

Sociodemographic predictor	P	Odds ratio	95% CI
Sex	.39		
Male		1.00	Referent
Female		0.97	0.92–1.03
Age (yr)	5×10^{-5}		
17–24		1.00	Referent
25–44		0.83	0.75–0.92
45–64		0.80	0.72–0.90
65+		1.05	0.89–1.24
Education (yr)	5×10^{-5}		
≤11		1.00	Referent
12		0.87	0.80–0.96
13–15		1.00	0.90–1.11
16+		1.34	1.19–1.52
Race	.31		
White		1.00	Referent
Black		1.05	0.95–1.17
Marital status	.36		
Married or cohabitating		1.00	Referent
Widowed		1.01	0.83–1.24
Divorced or separated		0.90	0.78–1.03
Never married		1.05	0.91–1.21

*Abstinence of at least 7 days.
†Data from Adult Use of Tobacco Survey, 1986.

Sociodemographic Predictors of a Major Quit Attempt

Results of the main effects model are presented in table 2. Of the five sociodemographic variables considered in this analysis, sex, race, and marital status were not significant predictors of who made a major quit attempt within the last year.

Age was a strong predictor of a major quit attempt; however, only those in the youngest and oldest categories were more likely to try to quit. Those aged between 25 and 44 and between 45 and 64 were approximately 20% less likely to make a major quit attempt than persons in either the younger or older categories.

Education was also a predictor of a major quit attempt; those with 16 or more years of education were 34% more likely to quit than those with either 11 or fewer years or 13–15 years of education. Those with 12 years of education were 13% less likely to make a major quit attempt than those with 11 or fewer years of education or those with 13–15 years of education. High school graduates were 47% less likely to make a major quit attempt than persons with 16 or more years of education.

Results from the parsimonious model (containing age, education, and age by education) are presented in table 3. This model was not statistically different from the model containing all main effects and all two-way interactions (likelihood ratio = 37.35; $df = 42$; $P = .67$). One age-by-education category stands out as very different from all the others in these data: persons 17–24 years old who have already had 16 or more years of education. While there were only 32 of the 5,446 target group in this category of 17–24 year olds, two thirds of these made a major quit attempt in the last year—over five times higher than the reference category (age 17–24 yr with ≤11 yr of education) or almost any other category. This group was much more likely to try to quit than the more highly educated who were a little older (aged 25–44 yr).

Only one category (ages 25–44 yr with ≤11 yr of education)

Table 3. Major quit attempt* by age and education: proportion of smokers who tried to quit in past 12 mo†

Age (yr)	Education (yr)	No.	% tried	Odds ratio	95% CI
17-24	≤11	156	28.8	1.00	Referent
	12	330	40.9	1.71	1.13-2.57
	13-15	159	36.5	1.42	0.88-2.27
	16+	32	68.7	5.43	2.38-12.36
25-44	≤11	341	20.2	0.63	0.40-0.97
	12	1,125	25.4	0.84	0.58-1.22
	13-15	749	29.8	1.05	0.71-1.53
	16+	522	34.9	1.32	0.89-1.95
45-64	≤11	357	29.4	1.03	0.68-1.56
	12	603	23.5	0.76	0.51-1.13
	13-15	320	25.9	0.86	0.56-1.32
	16+	203	30.0	1.06	0.67-1.68
65+	≤11	254	33.9	1.26	0.82-1.95
	12	160	25.6	0.85	0.52-1.40
	13-15	80	30.0	1.06	0.59-1.91
	16+	55	36.4	1.41	0.74-2.70

* Abstinence of at least 7 days.
† Data from Adult Use of Tobacco Survey, 1986.

was significantly less likely (37%) than the reference category to make a major quit attempt during the year.

To examine whether the observed effect in the younger, more highly educated individuals was not related to the small sample, we conducted the analysis with age as a continuous variable. The marked effect due to age in the highest education category persisted.

Predictions of Who Was Still Abstinent After at Least 3 Months

The main effects model for predicting who was still abstinent after at least 3 months showed that neither sex (P = .84), marital status (P = .46), nor education (P = .22) contributed significantly to the model. The parsimonious model included only age (P = .0001 in main effects model) and race (P = .06 in main effects model) without any interaction, and this model was not significantly different from the one containing all main effects and all two-way interactions (likelihood ratio = 18.38; df = 18; P = .43). However, with only 109 blacks in this analysis, some of the cells for interaction terms were very small. Specifically, only three blacks were over the age of 64 in this analysis. Accordingly, this model was confirmed by similar analyses limiting age to 17–64 years to verify the race effect, and only whites were considered to verify that age was the only other predictor.

Table 4 suggests that there is a dose-response effect for age, where success in quitting improves with increasing age. Over half of those in the oldest age category were able to maintain their quit attempt, which was substantially higher than in any other group. After adjustment for race, people over the age of 65 years who quit were three times more likely to be abstinent for at least 3 months than those between the ages of 17 and 24 years. Further, persons 65 and older were 2.7 times more likely to be successful in their attempt than those 25–44 years old (P = .002) and twice as likely to be successful as those 45–64 years old (P = .008).

Only 26% of the blacks who made a major quit attempt were able to maintain it for at least 3 months (table 4). After adjustment for age, blacks were 36% less likely to maintain their quit attempt than whites.

Discussion

Our results suggest that while there is considerable motivation to quit in the community, either the motivation level is not high enough to overcome the addictive nature of cigarette smoking (*12*), or many in the community do not have the requisite skills or support to maintain this major behavior change (*13*). It is crucial that the decline in smoking prevalence continue and, ideally, accelerate. Therefore, there is a need to identify any specific characteristics of those who are more likely to try to quit, as well as those who are more likely to be successful in their quit attempt.

In general, the level of education is positively correlated with making a quit attempt of 7 or more days. The effect of age is more complex: quitting attempts are more frequent among the youngest (17–24 yr) and the oldest (65+yr) age groups.

Smokers who were 17–24 years of age and had completed 16 or more years of education stand out as the group most likely to quit, with 22 of 32 subjects having reported a quitting attempt. The odds of attempting to quit for this group are thus 4.1 times as high as those of the group with the highest education in the next age category (95% CI = 1.9–8.9). However, the possible cohort effect suggested by this observation does not carry over to the other three age groups.

In summary, one may speculate that the quitting attempts are most frequent among the young, who are still experimenting with cigarettes, and the more aged people, who are confronted with the necessity to quit because of health problems. Smokers in the middle age categories (25–64 yr) have established a smoking history and are not yet forced by health problems to reexamine their smoking behavior. Clearly, education is a determining factor in smoking behavior. One feels tempted to argue that this is more so among the youngest, more susceptible age group. The current data are too sparse to support this argument, but further investigation is needed on the responsiveness of college students to antismoking campaigns. Again, one may speculate that the social pressure against smoking may be significant in colleges in the United States. If so, then this high social pressure needs to be better characterized so that interventions can be aimed at generalizing these pressures beyond the college setting.

Table 4. Successful quit attempt* among those who made a major quit attempt†

Sociodemographic predictor	% succeeded	No.	Odds ratio	95% CI
Age (yr)				
17-24	29	212	1.00	Referent
25-44	32	539	1.18	0.83-1.67
45-64	37	222	1.48	0.99-2.22
65+	56	71	3.15	1.77-5.37
Race				
White	36	935	1.00	Referent
Black	26	109	0.64	0.41-1.00

* Abstinence of ≥3 mo.
† Major quit attempt is abstinence of at least 7 days. Data from Adult Use of Tobacco Survey, 1986.

It should be noted that the American College Health Association has adopted a strong no-smoking policy and "encourages colleges and universities to be diligent in their effort to achieve a campus-wide tobacco/smoke-free environment"(*14*).

Maintenance of the cessation attempt for at least 3 months was predicted only by age and race. The marked increased success in maintaining cessation in those over 65 years may be a function of a higher mortality rate among smokers (*15*), which would bias this comparison toward finding a difference. However, it could also be associated with the increased incidence of smoking-related morbidity in this age category, leading to increased motivational levels to quit. Studies suggest that the presence of smoking-related morbid conditions may be associated with increased abstinence rates (*16*).

Further, although blacks were just as likely to quit as whites, they were less likely to be able to maintain abstinence. Even after controlling for education and other sociodemographic factors, Novotny et al. (*17*) also documented that blacks were less likely to have quit than whites. The observed difference between quit attempts and maintenance of abstinence for blacks may be partially attributed to psychosocial factors (e.g., motivational level or social influence) or possible biological differences in nicotine metabolism (*18*).

Educational level did not seem to be related to the ability to maintain abstinence for at least 3 months, although it was related to the likelihood that an individual would try to quit. It is possible that the reported effect of education (*4*) is associated only with the ability to maintain smoking cessation beyond 1 year, or it may be that there have been recent changes in the exposure to antismoking campaigns among the less educated, which diluted the education effect in recent years. There was a lack of difference in quitting between genders; this finding has previously been reported also for the quit ratio (*2*) and is a further indication that the difference in prevalence seen between the genders (*3*) is mainly an effect of differential uptake rates.

This analysis also indicates that, to properly evaluate the impact of smoking intervention in different communities, trends in recent quit attempts and in the ability to maintain success should be assessed for the various sociodemographic subgroups.

In conclusion, this article has characterized the recent quitting history of smokers in the United States. While we have previously reported that the pool of former smokers is increasing at a constant rate (≈1.3 million/yr) (*3*), there are many more smokers trying to quit. There is considerable consistency across sociodemographic groups in those who are making a quit attempt lasting 7 or more days, with the exception that persons who were 17–24 years old and had 16 or more years of education were more likely to make such an attempt than any other group. Using smoking cessation for at least 3 months as evidence of at least short-term success, we identified age and race as predictors of such success. In particular, those over the age of 65 years were much more successful than any other group.

It is now important to identify what it is about these groups that makes them more likely to make a major quit attempt and then to maintain the abstinence. Such targeted research is necessary if interventions to increase smoking cessation in the community are to become more effective.

References

(*1*) Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control: Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Surgeon General. DHHS Publ No. (CDC)89-8411. Rockville, Md: Centers for Disease Control, 1989

(*2*) Fiore MC, Novotny TE, Pierce JP, et al.: Trends in cigarette smoking in the United States. The changing influence of gender and race. JAMA 261:49–55, 1989

(*3*) Pierce JP, Fiore MC, Novotny TE, et al.: Trends in cigarette smoking in the United States. Projections to the year 2000. JAMA 261:61–65, 1989

(*4*) Pierce JP, Fiore MC, Novotny TE, et al.: Trends in cigarette smoking in the United States. Educational differences are increasing. JAMA 261:56–60, 1989

(*5*) Pierce JP, Aldrich RN, Hanratty S, et al.: Uptake and quitting smoking trends in Australia 1974–1984. Prev Med 16:252–260, 1987

(*6*) Hunt WA, Barnett LW, Branch LG: Relapse rates in addiction programs. J Clin Psychol 27:455–456, 1971

(*7*) Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control: U.S. Department of Health and Human Services Report of the 1986 Adult Use of Tobacco Survey. Rockville, Md: Centers for Disease Control, 1989

(*8*) Ossip-Klein DJ, Bigelow G, Parker SR, et al.: Classification and assessment of smoking behavior. Health Psychol 5(suppl):3–11, 1986

(*9*) BMDP, Inc: BMDP Statistical Software 1988 Release. Los Angeles: BMDP, 1988

(*10*) Vandenbroucke JP. Should we abandon statistical modeling altogether? Am J Epidemiol 126:10–13, 1987

(*11*) Hosmer D, Lemeshow S: Goodness of fit tests for the multiple logistic regression model. Community Stat A9:1043–1069, 1980

(*12*) Jackson PH, Stapleton JA, Russell MAH, et al.: Predictors of outcome in a general practitioner intervention against smoking. Prev Med 15: 244–253, 1986

(*13*) Mermelstein R, Cohen S, Lichtenstein E, et al.: Social support and smoking cessation and maintenance. J Consult Clin Psychol 54:447–453, 1986

(*14*) American College Health Association: Statement on tobacco use on college and university campuses, May 1988. J Am Coll Health 37:45, 1988

(*15*) Lew EA, Garfinkel L: Differences in mortality and longevity by sex, smoking habits and health status. Trans Soc Actuaries 39:107–130, 1987

(*16*) Henningfield JE, Clayton R, Pollin W: Involvement of tobacco in alcoholism and illicit drug use. Br J Addict 85:279–291, 1990

(*17*) Novotny TE, Warner KE, Kendrick JS, et al.: Smoking by blacks and whites: Socioeconomic and demographic differences. Am J Public Health 78:1187–1189, 1988

(*18*) Wagenknecht LE, Cutter GR, Haley NJ, et al.: Racial differences in serum cotinine levels among smokers in the CARDIA Study. Am J Public Health. In press

Journal of Consulting and Clinical Psychology
1991, Vol. 59, No. 3, 439-448

0022-006X/91/$3.00

Self-Help Quit Smoking Interventions: Effects of Self-Help Materials, Social Support Instructions, and Telephone Counseling

C. Tracy Orleans
Fox Chase Cancer Center
Philadelphia, Pennsylvania

Victor J. Schoenbach
Department of Epidemiology
University of North Carolina at Chapel Hill

Edward H. Wagner
Group Health Cooperative of Puget Sound, Seattle, Washington

Dana Quade
Department of Biostatistics
University of North Carolina at Chapel Hill

Mary Anne Salmon
Health Services Research Center
University of North Carolina at Chapel Hill

David C. Pearson and Judith Fiedler
Group Health Cooperative of Puget Sound, Seattle, Washington

Carol Q. Porter
Health Services Research Center
University of North Carolina at Chapel Hill

Berton H. Kaplan
Department of Epidemiology
University of North Carolina at Chapel Hill

Smokers requesting self-help materials for smoking cessation (N = 2,021) were randomized to receive (a) an experimental self-quitting guide emphasizing nicotine fading and other nonaversive behavioral strategies, (b) the same self-quitting guide with a support guide for the quitter's family and friends, (c) self-quitting and support guides along with four brief counselor calls, or (d) a control guide providing motivational and quit tips and referral to locally available guides and programs. Subjects were predominantly moderate to heavy smokers with a history of multiple previous quit attempts and treatments. Control subjects achieved quit rates similar to those of smokers using the experimental quitting guide, with fewer behavioral prequitting strategies and more outside treatments. Social support guides had no effect on perceived support for quitting or on 8- and 16-month quit rates. Telephone counseling increased adherence to the quitting protocol and quit rates.

Most smokers who try to quit do so without outside help, and most smokers prefer do-it-yourself quitting methods over formal face-to-face treatments (Fiore et al., 1990). An estimated 90% of America's 40 million ex-smokers *have* quit on their own (USDHHS, 1989). Yet, the success of self-quit attempts could be improved. Each year over 30% of American smokers attempt to quit, but fewer than 10% succeed (Fiore et al., 1990). The present study is one of seven funded by the National Cancer Institute (NCI) to evaluate minimal interventions to aid self-quitters (Glynn, Boyd, & Gruman, 1990).

Many guides have been developed to help smokers quit on their own (e.g., American Lung Association, 1980; Danaher & Lichtenstein, 1978). Most convert effective clinic programs into a self-administered format. Past research has shown that self-help quitting guides represent a promising alternative to clinic treatments (Cummings, Emont, Jaen, & Sciandra, 1988; Curry, Marlatt, Gordon, & Baer, 1988; Davis, Faust, & Ordentlich, 1984; Glasgow, Schafer, & O'Neill, 1981; Gritz et al., 1988). Quit rates have correlated with the amount of materials read and with degree of adherence to prescribed quitting activities (Cummings et al., 1988; Davis et al., 1984; Glasgow et al., 1981). However, problems of nonadherence have been common. Glasgow et al. (1981), for instance, found that smokers using standard behavior therapy manuals failed to complete many of the recommended self-quitting activities. Similarly, Gritz et al. (1988) found that only approximately half of the nurses enrolled in a self-quitting program used the self-help materials provided. Curry et al. (1988) found poorer adherence to behavioral quit-

This research was supported by Grant CA-38223 from the National Cancer Institute to the University of North Carolina Health Services Research Center. Portions of this article were presented at the annual meeting of the American Public Health Association, Boston, November 1988.

We are grateful to Brenda Allen, William Beery, Edward Brooks, John Hogan, William Kalsbeek, T. Robert Konrad, Mary Passmore, Kathryn Rose, Kathleen Saunders, Etta Short, Cheryl McCoubrey Sofian, Rebecca Thompson, Elizabeth Whelan, and Alison Woomert for vital assistance in the design and implementation of this trial, and to Tony Okinczyc for his help in analyzing biochemical validation data. We are also grateful for the support and resources of Group Health Cooperative of Puget Sound, the Fox Chase Cancer Center, and the Smoking, Tobacco and Cancer Program of the National Cancer Institute's Division of Cancer Prevention and Control, especially for guidance provided by Joseph Cullen, Thomas Glynn, and Gayle Boyd. Finally, thanks are due to Joan Magee, Marion Horn, and Alisa Salerno for clerical assistance, and to Edward Lichtenstein for his review of a draft of this article.

Correspondence concerning this article should be addressed to C. Tracy Orleans, Division of Behavioral Research, Fox Chase Cancer Center, 7701 Burholme Avenue, Philadelphia, Pennsylvania 19111.

ting protocols among smokers assigned to a self-help format than among those assigned to parallel group treatments. The high 10th–12th grade reading levels (O'Farrell & Keuthen, 1983) and complex behavioral assignments of many clinic-based manuals have been cited as adherence barriers (Glasgow et al., 1981).

Our study attempted to minimize adherence barriers in self-help materials and to improve self-quitting outcomes. An experimental quitting guide converted Foxx and Brown's (1979) nicotine fading clinic treatment into an easy-to-follow self-quitting format. A reading level suitable to the target audience was selected, and concrete adherence aids were supplied. In addition, two adjuncts to the guide were evaluated: (a) social support instructions designed to foster social support for quitting in the smoker's natural environment and (b) brief telephone counseling to promote and reinforce adherence to the self-quitting protocol.

Providing support instructions for the quitter's family, friends, and co-workers seems a promising avenue for improving self-quitting outcomes. Successful quitters report more positive support from significant others than do relapsers or continued smokers (Coppotelli & Orleans, 1985; Mermelstein, Cohen, Lichtenstein, Baer, & Kamarck, 1986). Measures of partner and co-worker support for quitting generally predict long-term quit rates among treated and untreated smokers (Lichtenstein, Glasgow, & Abrams, 1986). Although interventions to boost natural supports have not proven effective with clinic participants, who already have the benefit of therapist or peer support or both (Lichtenstein et al., 1986), we believed that efforts to enhance natural supports might prove more effective for *self*-quitters. In fact, the best results with self-help materials have occurred when outside supports have been present in the form of a supportive workplace environment (Gritz et al., 1988; Nepps, 1984).

Several lines of research suggested that minimal telephone counseling might boost adherence to self-quitting protocols and promote initial cessation and long-term maintenance. Glasgow et al. (1981) found that smokers receiving behavior therapy guides read more of the guides and achieved higher 6-month quit rates if they attended eight weekly therapist-led groups than if they used materials on their own. Dubren (1977) found that access to prerecorded reinforcing phone messages doubled 1-month maintenance among new ex-smokers who had quit in response to a televised clinic. Likewise, Davis et al. (1984) evaluated a variety of self-help materials and found the highest 12-month quit rates for smokers with access to reinforcing prerecorded phone messages. Janis's (1983) landmark review established that brief therapist support can promote adherence to a variety of demanding life-style change programs (e.g., smoking cessation, weight loss).

It was hypothesized that smokers receiving the experimental self-help guide would achieve higher long-term quit rates than would those receiving motivational quit tips and referral to outside resources. Furthermore, a cumulative treatment effect was predicted. Smokers receiving the experimental guide plus social support instructions were predicted to achieve better long-term outcomes than subjects receiving the guide alone. The best outcomes were predicted for subjects receiving the experimental guide with social support instructions plus minimal telephone counseling to promote adherence and to reinforce quitting efforts.

Method

Subjects

Subjects in the study were 2,021 enrollees (1,273 women and 748 men) of Group Health Cooperative of Puget Sound (GHC), a large health maintenance organization in western Washington State. Smokers "wanting to quit" were recruited to take part in a free "self-help quit smoking program" primarily through publicity and enrollment coupons in the GHC's monthly *View* magazine for enrollees: only 76 subjects were referred by their physicians or recruited through promotions in four GHC clinics. Recruitment procedures are described in detail by Wagner et al. (1990). No incentives were offered for participation or cessation. Prospective subjects completing a baseline questionnaire were included if they planned to remain in the Puget Sound area for at least 2 years, were 21 years or older, were not pregnant, had smoked for at least 1 year, and currently smoked three or more cigarettes per day.

Baseline Measures

The baseline questionnaire obtained standard sociodemographic data, a detailed smoking and quitting history, measures of health, smoking-related symptoms/illnesses, health life-style, anxiety, depression and stress, and measures of social network smoking and general and smoking-related social supports (Mermelstein et al., 1986; Moos, Cronkite, Billings, & Finney, 1986). Subjects supplied the uniform product code number from a pack of their usual brand of cigarettes for accurate brand identification. The Federal Trade Commission Report (USFTC, 1985) was used to estimate nicotine per cigarette and per day (number of cigarettes/day × mg nicotine/cigarette). Additional smoking history items covered motives for quitting, desire to quit, beliefs about smoking health harms and quitting benefits, perceived quitting barriers, use of past quitting treatments, confidence in quitting ability, and nicotine dependency (Fagerstrom, 1978). Informed consent information stipulated that subjects might be asked for periodic saliva samples to assess physical nicotine level.

Subjects were predominantly White (94%), married or living as married (69%), employed full-time (61%), and well-educated (49% high school; 29% college or beyond). They averaged 44.4 years of age (SD = 13.3) with a mean smoking history of 26.7 years (SD = 12.8). The mean number of cigarettes smoked per day was 26 (SD = 11), which is somewhat greater than the national average of 21 cigarettes/day (USDHHS, 1989). The average nicotine yield was .75 mg per cigarette. Fifty-one per cent of subjects were heavy smokers (25 or more cigarettes per day). Subjects had a mean score of 5.7 on the 11-point Fagerstrom (1978) Tolerance Questionnaire, and 77% said they smoked their first cigarette within 30 min of arising, a reliable index of high nicotine dependency (Pomerleau, Pomerleau, Majchrzak, Kloska, & Malakuti, 1990).

Subjects reported a mean of 3.5 previous quit attempts and many formal cessation treatments: 43% reported previous use of self-help guides; 35% reported previous use of intensive individual or group treatments; and 25% reported previous use of nicotine gum. In all, 64% reported past use of one or more of these different treatments. Subjects were relatively highly motivated to quit (M = 8.2 on a 0–10 scale) but only moderately confident in their ability to do so (M = 5.9 on a 0–10 scale). Most (85%) rated their health as good or excellent; 54% reported medical advice to quit smoking during the past year. Data comparing smokers participating in this trial with a random sample of smokers in

the GHC enrollee population are presented elsewhere (Wagner et al., 1990).

Research Design

Subjects were randomly assigned to one of three experimental intervention groups or a control group. Randomization was carried out separately within eight strata defined by three dichotomous variables: living alone or not, medical advice to stop smoking in the last 12 months or not, and nicotine content of cigarette brand (≤0.4 mg vs. >0.4 mg). Subjects enrolling from the same family or household were assigned to the same group.

Experimental Conditions

Self-quitting materials only group (Group M). Group M subjects (n = 502) received a copy of a 28-page self-quitting guide, which we entitled *Free & Clear*. The guide incorporated nicotine fading and standard behavioral abstinence and relapse prevention techniques (e.g., cognitive and behavioral strategies for avoiding smoking triggers and coping with urges and withdrawal symptoms, advice about how to garner support from friends and family, directions for recovering from a slip). Foxx and Brown's (1979) 4-week monitored nicotine fading protocol was converted to a self-administered format: Smokers made up to three weekly brand switches, each week switching to brands with up to 30% lower estimated nicotine yields. Abrupt target date quitting was scheduled after the 4th week. Instructions advised *quitting*, not continued smoking of low nicotine cigarettes, and warned against compensation through smoking more cigarettes, covering filter air holes, or inhaling more deeply or more often.

We wrote the *Free & Clear* quitting guide at the eighth–ninth grade reading level (Fry, 1968) and pretested it for appeal and readability among GHC enrollees. It included four postage-paid mail-back cards assessing treatment initiation and progress through the protocol. An accompanying "Quit Kit" contained concrete aids to cue and facilitate adherence (e.g., pack-sized cigarette tally cards for fading weeks, "Thank You For Not Smoking" signs, "I Quit" buttons, wallet-sized slip recovery tips) and a copy of the American Lung Association (ALA) maintenance manual, *A Lifetime of Freedom from Smoking* (ALA, 1980).

Self-quitting materials plus social support instructions (Group MS). Group MS subjects (n = 501) received Group M materials plus two copies of a 16-page social support guide. A cover letter asked subjects to read the support guide, then give copies to two "allies" (e.g., a spouse, close friend, or co-worker, preferably nonsmoking). In this support guide we described *Free & Clear's* quitting strategies and common withdrawal effects and recommended specific supportive actions for each stage of quitting (Coppotelli & Orleans, 1985; Mermelstein et al., 1986). We included advice for ex-smokers, smokers, and never smokers and wrote the guide at an eighth–ninth grade reading level (Fry, 1968).

Self-quitting materials, support instructions, and telephone counseling (Group MST). Group MST subjects (n = 510) received MS materials plus four prescheduled phone calls from a briefly trained counselor, with an invitation to call a "*Free & Clear* Quitline" for additional counseling as needed. Counselor calls were made at progressively longer intervals after the mailing of self-help materials (at a mean of 6, 18, 34, and 60 weeks). Following Janis's (1983) model, counselors sought to (a) provide positive, nonjudgmental feedback and reinforcement appropriate for the quitter's particular stage of change (contemplation, action, maintenance, relapse; Prochaska & DiClemente, 1983); (b) address personal quitting barriers; (c) elicit statements of intention to comply with stage-appropriate quitting actions; and (d) enhance self-efficacy and self-attributions for progress quitting. Counselors followed a *Free & Clear Counselors Guide* and written stage-based protocols for each call and estimated that it took 15–30 min to complete each call and call record.

Two of the counselors had master's-level training in health education and previous experience leading smoking cessation groups; a third bachelor's-level counselor had no previous training in smoking cessation. All were ex-smokers. Subjects always received calls from the same counselor, who sent a postcard asking that the subject call the Quitline in the event of repeated unsuccessful call attempts (only 6–12% of MST subjects at any phone follow-up). Only 25 MST subjects made calls to the Quitline during the 16-month follow-up period. One counselor handled all of these calls but had access to each subject's records from previous counselor-initiated calls.

Control condition (Group C). Group C subjects (n = 508) received an enhanced "usual care" intervention, which met GHC's standard of care for enrollees: We wrote a 13-page *Free & Clear* referral guide describing available self-help materials and local quitting treatments along with a copy of the NCI pamphlet *Clearing the Air*, the American Heart Association's guide *Weight Control Guidance in Smoking Cessation*, and a modified Quit Kit. The referral guide included motivational text; guidelines for selecting the most appropriate self-help or formal treatment; advice to quit abruptly on a target quit date; descriptions of state-of-the-art, low-cost cessation guides and behavioral treatment programs; and the name and phone number of a specific contact person for each guide or program listed. Free and low-cost resources were emphasized.

Reinforcement mailing. One year after enrollment, a random half of the subjects in each intervention group (M, MS, MST) were sent a reinforcement mailing. This 13-page guide provided specific recommendations for subjects in four different stages of change (contemplation, action, maintenance, relapse) and attempted to remotivate and reinforce quitting and use of the *Free & Clear* guide.

Dependent Measures

Eight-page questionnaires were sent to subjects approximately 8 and 16 months after enrollment. Subjects not returning a questionnaire were administered a shorter version by telephone. At the 16-month follow-up, an abbreviated telephone questionnaire was used for 72 subjects declining the standard 10-min interview. Interviewers were blind to the purpose of the study and avoided counseling or reinforcement for adherence to the self-quitting protocol.

Primary outcome measures at the 8- and 16-month follow-ups were the percentage of subjects who reported quitting smoking for at least 1 week and at least 1 month. Subjects were classified as abstinent only if they also reported no use of other tobacco products in the preceding month. These point-prevalence quit rates are recommended as primary outcome measures by the NCI because abstinence during these intervals (particularly 1 week) can be biochemically verified (NCI, 1986).

Follow-up assessments also covered quit attempts, smoking status, smoking rate, cigarette brand, nicotine dependence, desire to quit, confidence in quitting ability (confidence one would be smoke-free in 6 months), use and ratings of the different intervention components, and use of outside treatments. Measures of reduction in estimated nicotine intake were included as standard outcomes for nicotine fading protocols (Foxx & Brown, 1979), not as indices of presumed "safer" smoking. Measures of quitting and prequitting strategies were adapted from checklists previously developed to assess general approaches to quitting as well as specific behavioral and cognitive strategies (Cummings et al., 1988; Glasgow, Klesges, Mizes, & Pechacek, 1985). All subjects were asked how many of 12 different prequitting strategies they had used (e.g., setting a quit date, switching to lower nicotine brands, listing reasons for quitting), and subjects who had tried to quit were asked how

frequently they had used 11 different quitting methods (e.g., deep breathing, exercise, nonsmoking rewards, positive thinking).

Three quitting-related social support measures were used at 8 months. Subjects were asked to rate the frequencies of specific quitting-related behaviors of their primary supporter. A 10-item measure of positive support (e.g., expressing pleasure at your efforts to quit, participating in an activity with you that kept you from smoking) and a 5-item measure of negative support (e.g., expressing doubt about your ability to quit, criticizing your smoking) were created using items from the Partner Interaction Questionnaire developed and validated by Mermelstein et al. (1986). In addition, subjects were asked to rate the amount of understanding and support they received for their quitting efforts from family, friends, and co-workers, using an 11-point Likert-type scale.

Biochemical assessment. To improve the veracity of smoking self-report, all follow-up questionnaires and interviews began with a reminder that the subjects might be asked for a saliva specimen for nicotine assessment, creating a sort of "bogus pipeline" (e.g., Murray & Perry, 1987). Biochemical verification using standard saliva cotinine or saliva thiocyanate markers or both (Haley, Axelrad, & Tilton, 1983) was carried out at the 16-month follow-up. All self-reported quitters and a random sample of 58 self-reported continued smokers living in the Seattle metropolitan area (determined by zip code) were telephoned to arrange for saliva assessment.

Two specimens were obtained from each subject still reporting abstinence and agreeing to saliva collection. Cotinine analyses were performed by the American Health Foundation using a standard radioimmunoassay technique (Haley et al., 1983). (Specimens were sent to the laboratory with samples from 11 known nonsmokers and pairs of specimens from 20 randomly selected smokers. All negative and positive controls were correctly identified.) Subjects with saliva cotinine levels below the standard cutoff of 10 ng/ml were considered abstinent. Saliva thiocyanate analyses were performed by the University of Washington Biomedical Laboratories for 9 quitters reporting nicotine gum use at follow-up. Subjects with thiocyanate levels at or below the cutoff of 2,400 micromoles/liter were considered abstinent (Haley et al., 1983).

Results

Univariate analyses of variance (ANOVAs) for continuous measures and chi-square tests for dichotomous variables were used to compare groups. Tukey's multiple comparison procedure was used to evaluate pairwise group differences in the event of a significant ANOVA. Chi-square tests and *t* tests were used to evaluate the relationship of selected dependent measures to 8- and/or 16-month 1-week quit status. Two-tailed *p* values were used, and Satterthwaite (1946) *t*-test corrections were introduced in cases of unequal cell variance.

Treatment Group Comparability

Significant ($p < .05$) group differences emerged for only three of 80 baseline variables: perceived health status, sleep difficulties, and importance of greater control over one's life as a quitting motive. None of these three variables was significantly associated with 1-week quit status at the 8-month or 16-month follow-up. Therefore, no adjustments were made in subsequent analyses.

Loss to Follow-Up

Excluding subjects who were deceased ($n = 11$) or seriously ill ($n = 3$) yielded a 16-month follow-up population of 2,007. Response rates at the 8- and 16-month follow-ups were 91% and 94%, respectively, and did not differ across the four treatment groups at either follow-up. Outcome analyses presented in the remainder of this article are based on the 1,877 subjects who completed the 16-month follow-up.

The majority of respondents at the 8- and 16-month follow-up completed the mailed questionnaire (70% and 69%, respectively). There were no group differences in the proportion of mail versus phone response at either follow-up point.

A comparison of 16-month responders and nonresponders on 48 baseline variables showed that responders were significantly more likely to be female, to have completed more than high school, and to report a greater number of concerns about possible negative quitting outcomes (such as withdrawal and weight gain), more previous quit smoking treatments, more social network contacts, and more close personal relationships. Responders and nonresponders did not differ with regard to baseline daily smoking rate or estimated nicotine dose, nicotine dependency (Fagerstrom, 1978), desire to quit, quitting self-efficacy, number of previous quit attempts, or social support expected.

Use and Ratings of Self-Help Materials

At 8 months, 84% of subjects said they read "most" or "all" of the core *Free & Clear* materials (quitting guide or referral guide), and 77% said they read most or all of the supplementary booklets (ALA guide or NCI guide). There were no significant group differences in amount read, and there were no significant differences between 16-month (1-week) quitters and nonquitters in the amount read.

At 16 months, the *Free & Clear* quitting guide was rated by combined Group M, MS, and MST subjects as easy to follow ($M \pm SD = 1.84 \pm 1.27$), encouraging ($M = 1.99 \pm 1.22$), practical ($M = 2.13 \pm 1.26$), helpful ($M = 2.16 \pm 1.26$), attractive ($M = 2.10 \pm 1.20$), and teaching a lot that was new ($M = 2.72 \pm 1.29$; rating scale 1–5, 1 = *most favorable*). Multiple *t* tests showed significantly higher ratings for Group C control materials: *t*s (1328–1356) = 3.18–6.19, two-tailed, *p*s < .001.

At 16 months, subjects also rated how closely they had followed the materials, from *not at all* (1) to *read them through carefully, following the quitting plan step-by-step* (4). There was a significant overall treatment effect, $F(3, 1257) = 50.98$, $p < .001$. Paired comparisons showed that subjects in the control group followed their materials less closely ($M = 2.1 \pm .70$) than subjects in Groups M ($M = 2.7 \pm .92$), MS ($M = 2.7 \pm .89$), and MST ($M = 2.9 \pm .87$) and that Group MST subjects followed their materials most closely. This measure did not significantly differentiate subjects who were abstinent (for 1 week or more) at 16 months and subjects who were smoking at 16 months.

Thirty-nine percent of subjects in the three intervention groups (M, MS, MST) returned "Quit Date" mail-back cards indicating that they had taken the initial step of setting a quit date. The mean interval between the quit date set and the receipt of the guide was 7.25 weeks. Subjects who returned a quit date card were significantly more likely to be abstinent at the 16-month follow-up (23%) than were subjects who did not (14%), $\chi^2(1, N = 1,412) = 19.6$, $p < .0001$. Smaller proportions of subjects returned each of the three subsequent mail-back cards: 16,

11, and 8%, respectively. There were no significant group differences in mail-back return rates.

Treatment Outcomes

Biochemical verification. Fifty of the 58 self-reported smokers (86%) and 183 of the 210 self-reported quitters (87%) agreed to saliva sampling. Five quitters relapsed during the 1- to 3-week period between being called and having saliva collected, leaving 178 (85%) for cotinine analyses—which represents 54% (178/331) of all self-reported quitters. There were no significant group differences in the proportions of self-reported quitters selected for sampling or in sampling refusal rates.

Ninety-four percent (167/178) of these self-reported abstainers had cotinine values below the 10 ng/ml cutoff. Nine of the remaining 11 abstainers reported nicotine gum use, and all but 1 of the 9 had salivary thiocyanate levels below the 2,400 micromoles/liter cutoff. Therefore, biochemical analyses verified self-reported abstinence for 98% (175/178) of the self-reported abstainers tested. A worst case scenario, assuming that all those refusing or relapsing before sampling were smokers at the time of self-report, would yield an 80% confirmation rate (167/210). However, the similarity of refusal rates for self-reported smokers and quitters suggests that other factors in addition to deception contributed to refusing saliva testing.

Smoking and quitting outcomes. Self-reported quit rates averaged 17% across the four experimental conditions at 8 months and 18% at 16 months (Table 1). Mean duration of abstinence at 16 months was 8.7 months, with an average of 12% of subjects abstinent 6 months or longer. There were significant treatment effects for each major smoking outcome, generally favoring the MST group at both follow-ups. Quitters (abstinent for 1 week or more at 16 months) used more *pre*quitting strategies, $t(1193) = 4.63$, $p = .0001$, but not more *quitting* methods than nonquitters. Eighty percent of all subjects reported making at least one serious quit attempt after enrolling, with a significantly higher proportion of MST subjects doing so. Mean mg/nicotine per last cigarette smoked (an index of nicotine fading adherence) at the 16-month follow-up was significantly lower for all treatment groups than for the control group, and lower for Group MST than for Groups M and MS. Mean quitting confidence was significantly higher among MST than among C, M, or MS subjects.

Table 2 presents 16-month smoking behavior outcomes among continued smokers. Overall, there was a significant reduction in cigarette nicotine level, $F(3, 1195) = 7.41$, $p < .0001$. Subjects in each group decreased smoking rate, and subjects in all but the control group significantly reduced nicotine level per cigarette. MST subjects reported a greater mean reduction in nicotine per cigarette than did C, M, and MS subjects; they were more likely to reduce their daily estimated intake by at least 50% and also more likely to smoke within 30 min of awakening. Reductions in nicotine per cigarette and in estimated daily nicotine intake were greater for M and MS subjects than for C subjects. Mean desire to quit remained relatively high, with no significant differences between groups.

Reinforcement mailing effects. Effects of the 1-year reinforcement mailing among subjects in the M, MS, and MST conditions were examined for 15 selected 16-month outcomes (including quit rates, quit attempts, use of outside treatments, and quitting self-efficacy) using 3×2 ANOVAs. There were no significant interactions and only one significant ($p < .05$) main effect: subjects who received the mailing had significantly higher scores than those who did not on a composite variable reflecting having tried to cut down on the number of cigarettes, to switch to a lower nicotine brand, or to set a definite quit date. This result was considered spurious, and this treatment variable was dropped from further analyses.

Social support effects. Subjects in all conditions were asked at 8-months to indicate the number of people they invited to support their quitting efforts, the amount of overall quitting support received from friends and family, and the frequencies of positive support (e.g., expressing pleasure, helping the quitter think of substitutes) and negative support (e.g., expressing doubt about the quitter's ability to succeed) from a primary supporter (Mermelstein et al., 1986).

Subjects who were abstinent (for 1 week or more) at 16 months had higher 8-month ratings of overall support, $t(1714) = 5.92$, $p < .0001$, and higher 8-month ratings of positive support, $t(1028) = 3.44$, $p < .001$, and had lower 8-month ratings of negative support, $t(1032) = 1.99$, $p < .05$, than did subjects who were smoking at 16 months. However, as Table 3 shows, there were no treatment differences in the numbers of people invited to provide support, and the few differences in ratings of support received displayed no consistent patterns.

Distribution of social support instructions. The number of guides given out in Groups MS ($M = .96$) and MST ($M = 1.07$) did not differ significantly and was positively associated with 16-month 1-week quit status, $t(592) = 2.16$, $p = .031$. Overall, only 58% of subjects (55% MS, 60% MST, *ns*) reported handing out one or more social support guides. Subjects who gave out one or more guides reported higher overall support, $t(465) = 5.5$, $p = .0001$, and higher positive support, $t(512) = 4.6$, $p = .0001$, at 8 months. They also had higher 16-month 1-week abstinence rates, 27% vs. 18%, $\chi^2(1, N = 598) = 6.98$, $p = .008$.

Telephone counseling ratings. At 8 months, Group MST subjects were asked to rate how helpful they found the phone counseling they received and how helpful they found knowing that a telephone Quitline was available. Counseling ($M = 1.5, \pm.90$) and Quitline availability ($M = 1.6, \pm.96$) were rated as somewhat helpful (rating scale 0–4, 4 = *most helpful*). At 16 months, counseling ratings on five 5-point Likert-type scales (encouraging, personal, practical, helpful, helped me stay on track) were summed, yielding a favorable mean score of 9.33 (±4.6; range 5–25, 5 = *most favorable*). ANOVAs showed no significant differences in ratings given for the three different counselors.

Use of outside cessation treatments. At 8-months, 40% of Group C subjects said they had started a guide or program, and 22% said they had completed one. These subjects were more likely to be abstinent at 16 months (for 1 week or more) than were subjects who had not started or completed a guide or a program, $\chi^2(1, N = 159) = 14.49$, $p < .0001$, and $\chi^2(1, N = 141) = 25.27$, $p < .0001$, respectively. At 16 months, 59% of control subjects had used an outside treatment, including another book or guide, an individual treatment, a group treatment, or nicotine gum.

At 16 months, subjects were asked to report any outside quitting treatments used since enrolling in the study. As Table 4

Table 1
Percentages, Means, Standard Deviations, and Treatment Effects for Quitting Processes and Smoking Outcomes at 8- and 16-Month Follow-Ups

Variable	Condition				Treatment effect
	Group C (n = 465)	Group M (n = 467)	Group MS (n = 471)	Group MST (n = 474)	
8 months					
% ≥1-week abstinence	16.0_a	14.7_a	14.2_a	23.0_b	$\chi^2(3, N = 1{,}777) = 16.04$***
% ≥1-month abstinence	13.0_a	11.5_a	11.6_a	19.0_b	$\chi^2(3, N = 1{,}786) = 14.28$**
Prequitting strategies used (0–12)					
M	5.2_a	6.3_b	7.0_c	7.7_d	$F(3, 1193) = 42.29$***
SD	2.5	2.9	2.9	2.7	
Frequency of quitting methods (0–33)					
M	13.0	12.6	13.0	13.9	$F(3, 928) = 2.04$
SD	6.2	6.1	5.9	5.8	
16 months					
% ≥1-week abstinence	18.2_{ab}	15.2_a	14.2_a	23.0_b	$\chi^2(3, N = 1{,}874) = 15.75$**
% ≥1-month abstinence	15.2_a	13.7_a	12.3_a	21.5_b	$\chi^2(3, N = 1{,}875) = 17.63$***
% ≥6-month abstinence	11.2_a	9.1_a	10.7_a	18.1_b	$\chi^2(3, N = 1{,}860) = 20.90$***
Months since last quitting (quitters only)					
M	8.3	7.8	9.1	9.7	$F(3, 315) = 2.39$
SD	5.3	5.0	5.4	5.3	
% ≥1 serious quit attempt	76.9_a	77.2_a	80.9_{ab}	84.6_b	$\chi^2(3, N = 1{,}534) = 9.48$*
Nicotine last cigarette (mg)					
M	0.7_a	0.6_b	0.6_b	0.5_c	$\chi^2(3, N = 1{,}233) = 25.8$***
SD	0.29	0.35	0.36	0.36	
Quitting confidence (0–10)					
M	5.1_a	5.1_a	5.1_a	5.8_b	$\chi^2(3, N = 1{,}748) = 4.94$**
SD	3.3	3.3	3.1	3.3	

Note. Group C = control condition; M = self-quitting materials only; MS = M + social support instructions; MST = MS + telephone counseling. Means or percentages with different subscripts differ significantly ($p < .05$) on the basis of the Tukey multiple comparison procedure or single *df*, two-tailed chi-square tests.
* $p < .05$. ** $p < .01$. *** $p < .001$.

shows, control subjects (Group C) were significantly more likely than subjects in the three treatment groups (Groups M, MS, and MST) to report using other cessation guides, group treatments, and nicotine gum. Across all four groups, only the use of another guide was significantly related to 16-month 1-week quit status, and the effect was negative: Subjects using an additional guide were less likely to be abstinent, $\chi^2(1, N = 1{,}741) = 23.71$, $p < .0001$. However, 5 of the 16 within-group analyses showed significant differences between quitters and nonquitters in the use of outside treatments—with results indicating that outside treatments proved beneficial only for control subjects and detrimental only for treatment group subjects. Specifically, use of group treatment was associated with a significantly greater 16-month 1-week quit rate in Group C, $\chi^2(1, N = 434) = 8.86$, $p < .003$. Use of other guides was associated with significantly lower 16-month quit rates in Groups M, $\chi^2(1, N = 440) = 4.07$, $p < .04$; MS, $\chi^2(1, N = 433) = 11.88$, $p < .001$; and MST, $\chi^2(1, N = 440) = 9.07$, $p < .003$, and use of nicotine gum was associated with a significantly lower 16-month quit rate in Group M, $\chi^2(1, N = 451) = 4.97$, $p < .026$. Negative relationships between use of outside treatments and 16-month quit status among treatment group subjects suggest that these subjects may have turned to outside treatments *after* failing to quit with the experimental treatment.

Discussion

It was anticipated that smokers enrolling in this trial would self-select for a minimal contact treatment and therefore would consist largely of lighter, less addicted smokers with few past quit attempts or cessation treatments (Orleans, 1985; Wilcox, Prochaska, Velicer, & DiClemente, 1985). However, in the absence of efforts specifically to recruit such "ideal" self-quit candidates, this trial attracted smokers who had an extensive history of addiction, were veterans of multiple past quit attempts and treatments, and reported many pathophysiologic effects of smoking (Wagner et al., 1990). These older, heavier, more extensively treated smokers are less likely to succeed in quitting on their own than are younger, lighter smokers (Cohen et al., 1989; Cummings et al., 1988; Glasgow et al., 1985; Gritz et al., 1988; Wilcox et al., 1985). Future trials may benefit from efforts to recruit more appropriate self-quitting candidates (Schoenbach et al., 1990).

A major objective was to develop a self-quitting guide that would be helpful, easy to read, and easy to follow. To a considerable extent, this objective was achieved. The majority of subjects said they read most or all of the materials and followed the self-quitting program to some degree. The quitting guide was rated as generally helpful and easy to follow. These results com-

Table 2
Percentages, Means, Standard Deviations, and Treatment Effects for Smoking Outcomes Among Smokers at 16-Month Follow-Up

Variable	Condition				Treatment effect
	Group C (n = 465)	Group M (n = 467)	Group MS (n = 471)	Group MST (n = 474)	
Change in cigarettes/day					
M	−4.6	−3.7	−4.7	−4.7	$F(3, 1390) = 1.00$
SD	9.1	8.9	8.9	10.6	
Change in mg nicotine/cigarette					
M	$-.01_a$	$-.15_b$	$-.15_b$	$-.24_c$	$F(3, 1195) = 33.83$**
SD	0.17	0.29	0.29	0.30	
% reducing estimated daily nicotine intake ≥ 50%	16.5_a	30.9_b	36.3_b	48.7_c	$\chi^2(3, N = 1{,}175) = 67.00$**
% smoking within 30 min	66.8_a	70.1_a	68.8_a	78.5_b	$\chi^2(3, N = 967) = 8.84$*
Desire to quit (0–10)					
M	7.4	7.3	7.4	7.5	$F(3, 963) = .24$
SD	2.4	2.4	2.4	2.5	

Note. Group C = control condition; M = self-quitting materials only; MS = M + social support instructions; MST = MS + telephone counseling. Means or percentages with different subscripts differ significantly ($p < .05$) on the basis of the Tukey multiple comparison procedure or single *df*, two-tailed chi-square tests.
* $p < .05$. ** $p < .001$.

pare favorably with those reported in other studies of self-help materials (Cummings et al., 1988; Gritz et al., 1988). In contrast with past studies (Cummings et al., 1988; Glasgow et al., 1981; Gritz et al., 1988), the amount read did not predict long-term abstinence—perhaps because most subjects reported reading most or all of the materials. But 16-month quitters reported using a greater number of prequitting strategies (including brand switching) than did nonquitters.

The numbers of subjects returning mail-back adherence cards was disappointingly low. Reinforcement or feedback for their return might have heightened their use and adherence to the guide. In the future, mail-back cards might be used to identify nonadherent subjects needing additional help. Subjects who did not return an initial quit date card were significantly less likely to be abstinent at 16 months: They might benefit from a motivational prompt or offer of assistance 6–8 weeks after the mailing self-help materials.

The lack of an *un*treated control group limits the conclusions that can be drawn about the efficacy of the experimental quitting guide. Hypothesized differences in quit rates between the control and experimental guide did not occur. Smokers receiving the control guide achieved the same quit rates as did those receiving the experimental guide without telephone counseling. However, control and experimental subjects appear to have reached abstinence through somewhat different routes. Subjects receiving the experimental guide were more likely to use behavioral prequitting strategies (like setting a quit date, switching brands, listing quitting reasons); subjects receiving the control guide were more likely to use outside treatments (other guides, group treatments, nicotine gum). The very specific re-

Table 3
Means, Standard Deviations, and Treatment Effects for Social Support Ratings at 8-Month Follow-Up

Variable	Condition				Treatment effect
	Group C (n = 465)	Group M (n = 467)	Group MS (n = 471)	Group MST (n = 474)	
No. of people invited to help					
M	2.4	2.7	2.4	2.3	$F(3, 1143) = .84$
SD	2.9	4.1	2.9	2.1	
Overall quitting support (0–10)					
M	5.6	6.0	5.6	6.1	$F(3, 1715) = 2.66$*
SD	3.5	3.5	3.4	3.3	
Positive quitting support (0–30)					
M	10.0_{ab}	11.0_{ab}	9.7_a	11.2_b	$F(3, 1029) = 3.73$**
SD	5.7	6.5	6.3	6.5	
Negative quitting support (0–15)					
M	5.8	5.5	5.2	5.5	$F(3, 1033) = .94$
SD	3.9	3.9	4.0	3.8	

Note. Group C = control condition; M = self-quitting materials only; MS = M + social support instructions; MST = MS + telephone counseling. Means with different subscripts differ significantly ($p < .05$) on the basis of the Tukey mutiple comparison procedure.
* $p < .05$. ** $p < .01$.

Table 4
Percentages and Treatment Effects for Use of Outside Quitting Treatments at 16-Month Follow-Up

Treatment used (by %)	Condition				Treatment effect
	Group C (n = 435)	Group M (n = 451)	Group MS (n = 444)	Group MST (n = 444)	
Other books or guides	32_a	21_b	23_b	22_b	$\chi^2(3, N = 1{,}745) = 16.83^{**}$
Individual treatment	11	7	9	8	$\chi^2(3, N = 1{,}748) = 5.53$
Group treatment	14_a	8_b	7_b	9_b	$\chi^2(3, N = 1{,}759) = 13.64^{*}$
Nicotine gum	33_a	28_a	27_b	23_b	$\chi^2(3, N = 1{,}777) = 11.63^{*}$

Note. Group C = control condition; M = self-quitting materials only; MS = M + social support instructions; MST = MS + telephone counseling. Percentages with different subscripts differ significantly ($p < .05$) on the basis of single df chi-square tests.
$^{*}p < .01$. $^{**}p < .001$.

ferral information given in control materials; the emphasis on easily accessible, low-cost programs and materials; and the inclusion of advice on how to "self-triage" either to self-help or to more intensive treatments may have contributed to the relatively high use of outside treatments by control subjects. Incorporating these features into standard referral practices might boost the low rates of referral follow-through typically documented (e.g., Thompson et al., 1988).

Overall, our results indicate positive absolute outcomes for quitters using minimal contact strategies. The 14–18% 16-month quit rates for subjects receiving self-help materials approximate the 13–15% 12-month quit rates reported by Cohen et al. (1989) for two similar NCI trials with over 900 smokers receiving self-help materials, and these rates compare favorably with the 10% self-quit rate for the U.S. population as a whole (Fiore et al., 1990). The 23% 16-month quit rate among subjects receiving the self-help guide plus brief telephone counseling approximates the 20–25% long-term quit rates typically achieved with more intensive treatments (Glasgow & Lichtenstein, 1987; USDHHS, 1989). More than three quarters of the subjects in all groups reported making at least one serious attempt to quit smoking, and continued smokers reported significantly lower daily smoking rates and estimated nicotine intake at the 16-month follow-up. These findings may be less important as evidence of reduced smoking than as an index of progress from contemplation to action stages of change (Prochaska & DiClemente, 1983). Interventions that help smokers move ahead even one stage can double the chance that they will take further action on their own in the near future (Rossi, 1989).

A single reinforcement mailing sent 12 months after enrollment had no effect on program adherence or smoking behavior change. Earlier or more frequent (serial) mailings, or mailings containing personalized feedback, might have proven more effective (Glynn et al., 1990), but it is likely that the greatest benefit would come not from additional *print* materials but from reinforcements using different modalities (face-to-face, telephone, video; Kottke, Battista, DeFriese, & Brekke, 1988). In fact, this view is consistent with present findings concerning telephone counseling effects.

We hoped that intervening to raise natural social supports for quitting might prove more effective among self-quitters than it has proved among treated quitters. Lichtenstein, Glasgow, and Abrams (1986) reviewed five studies evaluating a variety of interventions to boost natural quitting supports (including coworker and spouse training programs and support manuals) and concluded that "the addition of a social support component to a standard behaviorally based cessation program in no case resulted in significant improvements in treatment outcome" (p. 617) or, for that matter, in the amount of support received.

Results of this self-help trial paralleled those of the studies Lichtenstein and colleagues reviewed: (a) Measures of naturally occurring social support for quitting strongly predicted long-term cessation, and (b) the intervention to heighten support (supporter guides) influenced neither support ratings nor long-term quit rates. As has been observed in other self-help studies (Gritz et al., 1988), the social support guides were not utilized as fully as expected: Only 58% of subjects handed out one or more support guides to significant others; and although they were written to facilitate quitters' requests for social support, the support guides did not appear to have this effect. Subjects in all conditions invited a similar number of people to help them quit.

Interestingly, those smokers who handed out supporter guides received more support from their natural environments and had higher 16-month quit rates than those who did not. However, these differences appear to reflect self-selection rather than any effect of the supporter guide per se. Future analyses will explore baseline differences between self-selected "social" and "solo" quitters—those who did and did not choose to use the support guides (K. Brownell, personal communication, June 20, 1987)—and will attempt to identify smokers most likely to utilize or benefit from support instructions.

Brief telephone counseling significantly improved long-term outcomes with self-help materials. Counselor calls boosted quit rates by a relative 50%. This effect was clear at the 8-month follow-up (after only two of the four calls had been made) and persisted through the 16-month follow-up. A higher proportion of subjects receiving counselor calls made one or more serious quit attempts. Subjects in this condition also had higher mean self-confidence scores. Nonquitters receiving counselor calls reported a greater mean reduction in nicotine per cigarette and were more likely to reduce their daily estimated intake by 50% or more, although they were also more likely to smoke.

The better outcomes of quitters receiving counselor calls appeared to reflect greater adherence to quitting protocol in the guide. Subjects receiving calls did not read more of their materials, but they did follow them more closely, and they used more

of the recommended prequitting strategies. Subjects rated the counseling they received as somewhat helpful but not "too" helpful. It may be that the calls were not so intrusive or coercive as to eclipse a personal attribution for success (Janis, 1983).

In summary, telephone counseling was found to be an effective strategy for assisting self-quitters. Reducing the costs of phone counseling could increase its potential for widespread application, for instance, in medical settings (Kottke et al., 1988). The strong counseling effect apparent at 8 months, after just two calls, suggests that four calls may not have been necessary. The similar outcomes achieved by the different counselors suggest that the role of lay counselors should be explored (Lando, 1987). Further research to identify the types of smokers most likely to benefit from counselor calls would be helpful. Finally, it is unknown whether comparable benefits might accrue if smokers could be induced to initiate calls *into* a telephone Quitline, eliminating costly contact time and telephone expenses. Additional research on the efficacy of calls into existing telephone quitlines, such as the NCI Cancer Information Service, is needed (Ossip-Klein, et al., 1991).

References

American Lung Association. (1980). *A lifetime of freedom from smoking.* New York: Author.

Cohen, S., Lichtenstein, E., Prochaska, J., Rossi, J., Gritz, E., Carr, C. R., Orleans, C. T., Schoenbach, V. J., Biener, L., Abrams, D., DiClemente, C., Curry, S., Cummings, M., Giovino, G., & Ossip-Klein, D. (1989). Some misconceptions about self-quitting: Evidence from 10 prospective studies of persons quitting smoking by themselves. *American Psychologist, 44,* 1355–1366.

Coppotelli, H., & Orleans, C. T. (1985). Partner support and other determinants of smoking maintenance among women. *Journal of Consulting and Clinical Psychology, 33,* 455–460.

Cummings, K. M., Emont, S. L., Jaen, C., & Sciandra, R. (1988). Format and quitting instructions as factors influencing the impact of a self-administered quit smoking program. *Health Education Quarterly, 15,* 199–216.

Curry, S. J., Marlatt, G. A., Gordon, J., & Baer, J. S. (1988). A comparison of alternative theoretical approaches to smoking cessation and relapse. *Health Psychology, 7,* 545–556.

Danaher, B., & Lichtenstein, E. (1978). *Become an ex-smoker.* Englewood Cliffs, NJ: Prentice-Hall.

Davis, A. L., Faust, R., & Ordentlich, M. (1984). Self-help smoking cessation and maintenance programs: A comparative study with 12-month follow-up by the American Lung Association. *American Journal of Public Health, 74,* 1212–1217.

Dubren, R. (1977). Self-reinforcement by recorded telephone messages to maintain nonsmoking behavior. *Journal of Consulting and Clinical Psychology, 45,* 358–360.

Fagerstrom, K. O. (1978). Measuring degree of physical dependence to tobacco smoking with reference to individualization of treatment. *Addictive Behaviors, 3,* 235–241.

Fiore, M. C., Novotny, T. E., Pierce, J. P., Giovino, G. A., Hatziandreu, E. J., Newcomb, P. A., Surawicz, T. S., & Davis, R. M. (1990). Methods used to quit smoking in the United States: Do cessation programs help? *Journal of the American Medical Association, 263,* 2760–2765.

Foxx, R. M., & Brown, R. A. (1979). Nicotine fading and self-monitoring for cigarette abstinence or controlled smoking. *Journal of Applied Behavior Analysis, 12,* 111–125.

Fry, E. B. (1968). A readability formula that saves time. *Journal of Reading, 11,* 513–516.

Glasgow, R. E., Klesges, R. C., Mizes, J. S., & Pechacek, T. F. (1985). Quitting smoking: Strategies used and variables associated with success in a stop-smoking contest. *Journal of Consulting and Clinical Psychology, 53,* 905–912.

Glasgow, R. E., & Lichtenstein, E. (1987). Long-term effects of behavioral smoking cessation interventions. *Behavior Therapy, 18,* 297–324.

Glasgow, R. E., Schafer, L., & O'Neill, H. K. (1981). Self-help books and amount of therapist contact in smoking cessation programs. *Journal of Consulting and Clinical Psychology, 49,* 659–667.

Glynn, T. J., Boyd, G. M., & Gruman, J. C. (1990). Essential elements of self-help minimal intervention strategies for smoking cessation. *Health Education Quarterly, 17,* 329–345.

Gritz, E. R., Marcus, A. C., Berman, B. A., Read, L. L., Kanim, L. E., & Reeder, S. J. (1988). Evaluation of a worksite self-help smoking cessation program for registered nurses. *American Journal of Health Promotion, 3,* 26–35.

Haley, N. J., Axelrad, C. M., & Tilton, K. A. (1983). Validation of self-reported smoking behavior: Biochemical analyses of cotinine and thiocyanate. *American Journal of Public Health, 73,* 1204–1207.

Janis, I. C. (1983). The role of social support in adherence to stressful decisions. *American Psychologist, 38,* 143–160.

Kottke, T. E., Battista, R. N., DeFriese, G. H., & Brekke, M. L. (1988). Attributes of successful smoking cessation interventions in medical practice. *Journal of the American Medical Association, 259,* 2883–2889.

Lando, H. (1987). Lay facilitators as effective smoking cessation counselors. *Addictive Behaviors, 12,* 69–72.

Lichtenstein, E., Glasgow, R. E., & Abrams, D. B. (1986). Social support in smoking cessation: In search of effective interventions. *Behavior Therapy, 17,* 607–619.

Mermelstein, R., Cohen, S., Lichtenstein, E., Baer, J. S., & Kamarck, T. (1986). Social support and smoking cessation and maintenance. *Journal of Consulting and Clinical Psychology, 54,* 447–453.

Moos, R. H., Cronkite, R. C., Billings, A. G., & Finney, J. W. (1986). *Health and Daily Living Form Manual.* Palo Alto, CA: Stanford University Medical Center.

Murray, D. M., & Perry, C. L. (1987). The measurement of substance abuse among adolescents: When is the "bogus pipeline" method needed? *Addictive Behaviors, 12,* 225–233.

Nepps, M. M. (1984). Minimal contact smoking cessation program at the worksite. *Addictive Behaviors, 9,* 291–294.

National Cancer Institute. (1986). *Smoking, tobacco, and cancer program: 1985 report.* Bethesda, MD: United States Department of Health and Human Services, National Institutes of Health Publication No. 86-2687.

O'Farrell, T. J., & Keuthen, N. J. (1983). Readability of behavior therapy self-help manuals. *Behavior Therapy, 14,* 449–455.

Orleans, C. T. (1985). Understanding and promoting smoking cessation: Overview and guidelines for physician intervention. *Annual Review of Medicine, 36,* 51–61.

Ossip-Klein, D. J., Giovino, G. A., Megahed, N., Black, P. M., Emont, S. L., Stiggins, J., Shulman, E., & Moore, L. (1991). Effects of a smokers' hotline: Results of a 10-county self-help trial. *Journal of Consulting and Clinical Psychology, 59,* 325–332.

Pomerleau, C. S., Pomerleau, O. F., Majchrzak, M. S., Kloska, D. D., & Malakuti, R. (1990). Relationship between nicotine tolerance questionnaire scores and plasma cotinine. *Addictive Behaviors, 15,* 73–81.

Prochaska, J. O., & DiClemente, C. C. (1983). Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology, 51,* 390–395.

Rossi, J. (1989). The hazards of sunlight: A report on the Consensus Development Conference on Sunlight, Ultraviolet Radiation and the Skin. *Health Psychologist, 11,* 3–5.

Satterthwaite, F. W. (1946). An approximate distribution of estimates of variance components. *Biomedical Bulletin, 2,* 110–114.

Schoenbach, V. J., Orleans, C. T., Wagner, E. H., Quade, D., Salmon, M. A. P., & Porter, C. (1990). *Characteristics of smokers who enroll and quit in self-help programs.* Manuscript submitted for publication.

Thompson, R. S., Michnich, M., Friedlander, L., Gilson, B., Grothaus, L. C., & Storer, B. (1988). Effectiveness of smoking cessation interventions integrated into primary care practice. *Medical Care, 26,* 62–76.

USDHHS (United States Department of Health and Human Services). (1989). *Reducing the health consequences of smoking: A report of the Surgeon General (Publication No. CDC 89-8411).* Rockville, MD: U.S. Government Printing Office.

USFTC (United States Federal Trade Commission). (1985). *"Tar," nicotine and carbon monoxide of the smoke of 207 varieties of domestic cigarettes.* Rockville, MD: Office on Smoking and Health.

Wagner, E. H., Schoenbach, V. J., Orleans, C. T., Grothaus, L. C., Saunders, K. W., Curry, S., & Pearson, D. C. (1990). Participation in a smoking cessation program: A population-based perspective. *American Journal of Preventive Medicine, 6,* 258–266.

Wilcox, N. S., Prochaska, J. O., Velicer, W. F., & DiClemente, C. C. (1985). Subject characteristics as predictors of self-change in smoking. *Addictive Behaviors, 10,* 407–412.

Received May 7, 1990
Revision received December 17, 1990
Accepted December 17, 1990 ■

The Role of Tobacco Intervention in Population-Based Health Care: A Case Study

DRAFT

Tim McAfee, MD, MPH
Director, Center for Health Promotion
Group Health Cooperative of Puget Sound

Julie Wilson, MPH
Assistant Director, Center for Health Promotion
Group Health Cooperative of Puget Sound

Neal S. Sofian, MSPH
Vice President, Program Development
Lexant (Monsanto)

Michael Hindmarsh, MA
Clinical Improvement Coordinator
Group Health Cooperative of Puget Sound

Send correspondence to:
Tim McAfee
Suite 1520 - Center for Health Promotion
Group Health Cooperative
1730 Minor Ave
Seattle WA 98101
mcafee.t@ghc.org

Send reprint requests:
Julie Wilson
Suite 1520 - Center for Health Promotion
Group Health Cooperative
1730 Minor Ave
Seattle WA 98101

ABSTRACT

Managed care organizations are in an excellent position to implement population-based, as well as patient-centered approaches, to reduce behavioral risk factors associated with major chronic diseases. Group Health Cooperative of Puget Sound employed a population-based model for smoking that contributed to a decrease from 25% to 15.5% in smoking prevalence in ten years among its more than 550,000 adult enrollees in western Washington. This model may have application to other arenas where health systems can support beneficial behavior change.

INTRODUCTION

This paper describes the efforts of Group Health Cooperative (GHC) of Puget Sound to develop an effective and comprehensive evidence-based approach to decreasing the prevalence of tobacco use among its members. The interventions described here may also serve as a model for creating and delivering additional population-based approaches that address other risk factors and conditions. The paper outlines GHC's overall population-based approach to prevention, its application to tobacco use, and efforts to replicate the model in other areas such as diabetes.

POPULATION-BASED APPROACH TO PREVENTION

Background

How does a purchaser of health care make a decision favoring one health plan over another? Until recently, price has often been the primary, or even the only, determining factor. Price remains an important consideration, but purchasers are also beginning to look more closely at the total quality of the health plan, and prevention is an essential part of this.

The idea of measuring quality is not new, but until the advent of the National Committee on Quality Assurance (NCQA), a non-governmental national organization that accredits managed care organizations, there had never been agreed-upon standards to define it, measure it, or a way to make meaningful comparisons among managed care plans. The NCQA, in its original pilot study to build performance indicators, chose to take a population-based approach to quality rather than simply to document professional credentials and medical care activities. These performance indicators built on the work of Healthy People 2000 goals,[1] a measurable set of targets developed by the government as a mechanism to prevent major chronic illnesses, injuries, and infectious diseases. The goals were designed to help create national consensus target for these health issues. NCQA performance indicators (also called HEDIS measures) provide an easy reference for managed care organizations (MCOs) and purchasers of health care to identify quality and track changes over the course of time. Using these standards as a means to assess progress, MCOs can begin to think of their membership as a 'community of health consumers' or population who they would like to impact as a whole. Rather than only looking at the impact of individual healthcare interventions, MCOs can explore strategies to reach large numbers of people and generate significant positive impact on health status for both individuals and the population as a whole[2]

History of Prevention at GHC

GHC is a mixed-model MCO with more than 550,000 members in Western Washington. Since its inception in 1947 GHC has been committed to integrating preventive care and health promotion services into its core medical care offerings[3]. GHC created a Committee on Prevention (COP) in 1978 to establish a locus of responsibility within the organization for prevention guidelines, program development, and implementation. In addition, a Department of Preventive Care and Center for Health Promotion were created to, among other things, provide staffing for the analysis of prevention and health promotion issues and program implementation. These departments also work in collaboration with GHC's Center for Health Studies to bring in external funding to help answer critical research questions that affect the delivery of preventive care. By 1987 GHC preventive care guidelines had been compiled into a manual and distributed to all practitioners throughout the GHC system.

In 1991, the COP sponsored a process for winnowing down a list of more than 170 prevention activities to the "Vital Few" that would have the greatest impact on morbidity and mortality. Eleven conditions and behaviors were identified as accounting for 80% of the morbidity and mortality at GHC. The committee did not rank these conditions with one exception, tobacco use was identified as the number one cause of preventable morbidity and mortality[4] and GHC's number one prevention priority.

TOBACCO USE REDUCTION

The identification of tobacco use as GHC's number one prevention area grew out of work done by a group of providers, planners and researchers who formed a subcommittee sponsored by the COP. Their 1991 report, "Decreasing Tobacco Use at Group Health Cooperative" [5] clearly delineated how tobacco met the COP's review analysis format for disease prevention/health promotion issues. In summary, it documented the following:

1) Tobacco use at GHC was prevalent. In 1985 over 25% of adult GHC members smoked. This translated to approximately 63,000 adult subscribers who were smokers or who used other forms of tobacco.
2) Tobacco use could be easily identified by asking about it at every clinical encounter.
3) Tobacco use causes significant morbidity and mortality, including increased incidence and greater complications in cancers, cardiovascular disease, diabetes, asthma, etc. GHC estimated deaths from these conditions totaled about 500/year among GHC members and resulted in tremendous, unnecessary health-care costs, estimated at $18 million/year at GHC.
4) Smoking cessation has major health benefits for smokers of all ages.
5) Randomized controlled trials had demonstrated that having physicians provide advice to quit and supporting that message with brief, repetitive messages from multiple sources could triple long-term cessation rates[6].
6) A rough cost effectiveness calculation based upon a model used by the state of Washington showed a cost-per-quit of $582 and a cost-per-year of life saved of $400. In comparison, HTN and cholesterol treatment and cervical, breast and colon cancer screening average $10,000 to $100,000 cost-per-year of life saved.

In addition, tobacco could serve as a model for future intervention development. Historically, prevention programs within MCOs have emphasized screening tests and immunizations. Future improvements in prevention outcomes will require interventions that are able to change individual health behaviors on a population-wide basis.

Recommendations and Strategies

The report proposed a goal to decrease the prevalence of tobacco use at GHC by 50%, from the 1985 level of 25% to 12.5% by the year 2,000.

The program objective was to initiate a comprehensive, coordinated set of interventions. Strategies were as follows:

1. Identify, track, and treat tobacco users with the same vigor as is done for other diseases with significant morbidity and mortality.
2. Establish coverage of tobacco services for which clinical effectiveness has been convincingly established.
3. During clinic contacts and through school and community outreach, encourage adolescents never to become tobacco users.

4. Make tobacco use prevention a top lobbying priority of the GHC Legislative Affairs Office.
5. Develop educational programs about tobacco use and services for staff at all levels, including nurses, physicians, clerical staff, medical assistants, and pharmacy employees. Encourage and support on-going programs to decrease the prevalence of tobacco use among GHC employees.
6. Maintain a standing tobacco services subcommittee that reports to the COP.
7. Seek funding to help support the implementation of a comprehensive tobacco use reduction initiative. Implementation should not depend on the acquisition of external funds such as research grants.

These strategies assume that a population-based strategy requires different interventions in a variety of settings. For example, media and school-based programs and legislative activity to decrease smoking initiation among youth are more effective than teen focused cessation programming, since there is not yet any evidence for effectiveness in teen cessation programs.

The potential for health improvement and long-term cost savings described in the report had a profound impact. The document was endorsed by the COP and worked its way up the GHC chain of committees, receiving top leadership endorsement and has since served as the basis for using tobacco use status as a key health indicator within GHC.

CONVERGENCE BETWEEN PREVENTION AND QUALITY OF CARE: TOBACCO ROADMAP

GHC, like many MCO's, has been actively developing and implementing plans to improve health outcomes while, where feasible, reducing costs. To accomplish this challenging objective, GHC has developed a series of clinical roadmaps. These roadmaps, or plans developed by interdisciplinary teams from throughout the Cooperative, use the tools of total quality management and evidence-based medicine to focus on the critical areas that can have the greatest impact on the health of our members. These roadmaps were established by identifying the conditions and diseases that result in high utilization and high cost, the number of members affected by the disease or condition, where there is a gap between known achievable outcomes and current practice, and formalized input from practitioners about which conditions and diseases required the most complicated care.

In the course of researching the most effective strategies for designing and implementing the roadmap process in care management, a critical convergence occurred. Many of the areas identified as high priority on the care side had already been identified as the vital few on the prevention side. Practitioners whose primary focus had been a largely reactive, one-to-one, clinical approach, were learning that an effective long-term strategy to improve health status and to control costs was a prevention-oriented, proactive, population based model of care. Based on this convergence, tobacco reduction became not only the number one prevention priority of the organization but also one of the organization's first four clinical roadmaps.

Implementing the Tobacco Roadmap

One of the first steps for the Tobacco roadmap steering committee was to define clear, measurable outcomes. Specifically, goals for the year 2000 were to :
-Decrease smoking prevalence among GHC enrollees 18+ years of age to 12.5%.
-Reduce from 21% to 10% initiation of smoking among GHC members before the age of 21.

-Increase from 25% to 95% the percent of medical records that have the patient's tobacco status prominently displayed.
-Increase from 20% to 80% the percent of charts that document advice to quit at the most recent primary care visit.

Organizational Support

Making tobacco use reduction a clinical roadmap increased senior leadership and clinical support for a variety of population-based approaches to reducing tobacco use among members. Nonetheless, in a large, mixed-model MCO with many competing demands and clinical priorities, taking a population-based approach to a health risk factor was a challenge. Although there had been proven, effective behavioral and pharmacological interventions available that could result in tobacco reduction for many years, it was clear they were not consistently used by health-care practitioners or patients. The tobacco team therefore chose to apply lessons learned from individual behavior-change theory[7] to institutional changes, i.e., to determine how ready the person or organizational unit is to change and then to deliver consistent messages matching that readiness state, with provision of assistance and follow up for the agreed-upon changes. Change messages included presentations and provider training, letters to employees from the medical director and CEO, communication pieces directed to front-line staff, etc. Four years of commitment to these messages moved tobacco use to the front line[8].

Cessation Services

A top priority was to provide plan coverage for tobacco cessation services. GHC had a smoking-cessation program, FREE & CLEAR, but the program was not covered as a benefit. This presented a major barrier to participation and the lack of accessible follow up for motivated smokers was a problem. To address this barrier, in 1992 GHC provided coverage for FREE & CLEAR (with a copay) and for nicotine replacement therapy (NRT) for FREE & CLEAR participants who were determined to be appropriate candidates for NRT. There was a 10 fold increase in program participation that year.

In 1996 GHC completed a review of the effects of varying the benefit structure on utilization, satisfaction, and outcomes. The review demonstrated that by eliminating copays it is possible to dramatically increase participation in cessation services while only marginally affecting cessation rates. Thus, reducing barriers to treatment results in far more individuals successfully quitting smoking. In addition, GHC found that in cohorts with a $42 copay approximately 30% of registrants in the FREE & CLEAR Program do not participate. In contrast, in groups with no copay, only 1% of those who register do not participate. Evidence to date suggests that, by removing copays from the behavioral program within the context of a comprehensive organizational effort to reduce tobacco use, it may be possible to increase enrollment to as many as 8% to 10% of smokers per year in a given population. Given these findings, in May 1997 GHC began providing full coverage for tobacco cessation services.

FREE & CLEAR Program for Smoking Cessation

The FREE & CLEAR program was tested and validated in a National Cancer Institute-sponsored randomized clinical trial at GHC[9]. The cessation program is available in two types of behavior modification support: 1) proactive outbound telephone calls, or 2) group meetings. About two-thirds of registrants choose the telephone calls. For those who participate in the telephone program, after they register program materials are sent and the outbound phone intervention begins. During the first call, the phone specialist assesses the

smoker's nicotine dependence, readiness to quit, motivation to use behavioral techniques, and self-efficacy regarding cessation. With the smoker, the specialist develops a quitting plan that may include nicotine fading, involving brand switching before quitting. A recommendation for use of NRT, if appropriate, is included. Phone follow-up (for additional calls) is scheduled for one full year. In the group format a similar program is followed through a series of 8 classes in a 6 week period. Throughout the year care providers receive letters regarding their patient's progress and receive periodic feedback about the number of patients on their panel or in their clinic who are enrolled in the FREE & CLEAR program compared to the overall organization. The program also generates a letter from the physician to the patient congratulating them on enrolling. The goal throughout this process is to link the physician with the patient and vice versa.

If NRT is part of the quit plan (about 60-70% of FREE & CLEAR participants use NRT), recommendations on the appropriate starting dose and duration of therapy are made. This process, including coverage, has remained in place, even though today NRT is an over-the-counter product. Four to seven days after initiating NRT, the patient is called by a GHC staff member who checks for symptoms of under-or overdosing and gives behavioral support during the first week of quitting, a critical time.

The program is in the process of integrating bupropion into its algorithm, based on the results of several randomized controlled trials indicating it is efficacious[10].

Brief, Repetitive Messages

Another key strategy was the development of an infrastructure which supported the provision of brief, supportive, repetitive messages to quit smoking given from multiple sources. An important "source" of this message is the smoker's provider. GHC developed a guideline based on the National Cancer Institute's "Ask, Advise, Assist, and Arrange follow-up" model[11], and distributed this to all primary care teams along with an implementation manual, tools, training and ongoing support for guideline integration.

In addition, GHC provided broad-based consumer and community based education through its bimonthly distribution of Northwest Health magazine to all households of GHC consumers. Northwest Health is the third most widely distributed magazine or newspaper in Washington. As a component of the population-based approach, Northwest Health has run a major tobacco-related story in many issues, including a Garrison Keillor story describing his experiences quitting smoking, pictorial essays of counter-ads, several analyses of the tobacco industries attempts to ensnare children, and profiles of successful GHC "quitters." They have also run large ads for the FREE & CLEAR program.

Population-based Primary Prevention Efforts

The GHC clinical guideline for prevention of tobacco use calls for clinicians to engage in activities such as letter-writing and testifying for policy changes on tobacco issues. In addition, GHC has applied its organizational weight to numerous community and legislative initiatives in Washington State. Support for these activities grew out of our outcome-based approach. For example, although research in adolescent cessation has been discouraging, there is considerable evidence that changes in public policy and community norms can result in a decrease in smoking initiation and can support adult cessation[12].

Some administrative, marketing and medical staff within GHC were resistant to this community-based approach. In their view:

- This is not an appropriate arena for HMO activity - "It's the health department's job"

- The effectiveness of community strategies was questionable
- Resources should be directed at more bottom-line issues such as hiring more nurses
- It is difficult for organizations working on tobacco control (e.g., governmental bureaucracies, advocacy groups) to cooperate effectively.

Nonetheless, GHC was able to garner support from key decision makers throughout the Cooperative by emphasizing that evidence supported this approach to achieving its desired outcomes. GHC has remained active in several coalitions that support regulatory change and legislation directed at: decreasing youth access to tobacco products; increasing counter-advertising and tobacco education; obtaining a dedicated tobacco excise tax to support prevention activities; and strengthening clean indoor air regulations. GHC has co-sponsored a children's art counter-ad poster contest, provided free office space and grant support to Washington "DOC" (Doctors Ought to Care: a State-based tobacco control organization), provided seed grants to the American Heart Association for tobacco control, provided testimony in support of an office smoking ban, and encouraged staff participation in the Tobacco-Free Washington coalition.

GHC's chief executive officer, physicians, staff, and lobbyists have successfully fought a "smoker's rights" bill and successfully supported a youth access bill that eliminated vending machines and required licensing fees and penalties for merchants selling tobacco to minors (with the money raised being devoted to enforcement and youth use prevention programs). In addition, GHC staff members were instrumental in establishing a large coalition of community groups that helped convince the Seattle Times newspaper in 1993 to stop accepting tobacco advertisements. Washington State has now banned smoking in all public (government or private) office buildings. Through the work of many organizations, including GHC, as of July 1, 1995, Washington had one of the highest tobacco taxes in the nation.

RESULTS

Measurement of process and outcome measures for GHC roadmaps, including tobacco, is coordinated by the Division of Clinical Planning and Improvement. Quarterly chart audits are conducted to measure the following process measures: documentation of tobacco use status and provision of advice to quit for patients who smoke. In addition, tobacco related questions have been included on phone-based satisfaction surveys as a way to annually measure tobacco use prevalence and patient self-report of the above stated measures.

GHC has seen the following improvements:

- The prevalence of tobacco use among adults dropped from 25% in 1985 to 20% in 1990 and 15.2% in 1996. This stands in contrast to data obtained via random phone surveys which showed a much slower rate of decline during the same period in the state of Washington's general population: 23% in 1987 to 21% in 1993. (Figure 1)
- The percent of charts in which a patients tobacco use status is prominently identified has increased from 25% in 1992 to 91% in 1997.
- The percent of smoking patients who received advice to quit at their last primary care visit as measured by chart documentation has increased from 20% to 40% (first quarter 1997).
- The percent of smoking parents who took their child in for an appointment and received advice about the dangers of exposure to cigarette smoke increased from 45% in 1994 to 68% in 1996.
- Participation in the FREE & CLEAR program increased eleven-fold from 175 in 1992 to more than 2,000 in 1993 and surpassing 2,500 in 1997. Twelve month one-week point prevalence data showed over 30% of participants were not smoking (non-responders are counted as smokers).

- The largest referral source for FREE & CLEAR participants is physicians (40% of referrals in 1994); 83% of primary care providers are satisfied or very satisfied with the FREE & CLEAR program.
- There had also been a ten-fold increase in the use of GHC's principal tobacco use self-help patient education piece, "Clearing the Air," developed by the National Cancer Institute customized to Group Health and provided free to clinics since GHC's organized tobacco reduction efforts began.

Figure 1. Insert Prevalence graph here

REPLICABILITY OF THE MODEL: Diabetes

The GHC effort to reduce tobacco use among its entire member population has demonstrated that it is possible for an MCO to take a population approach to a key health risk factor and get significant results. The next question is: can this conceptual approach be replicated for behaviors such as physical activity and diet or in a disease state like diabetes, cancer, or heart disease? Though the specific strategies applied to each risk factor or disease state could vary considerably, there is no reason to believe working from a similar model would be problematic for other health risk and/or disease management areas. Examples could include the remaining list of the Vital Few; listed alphabetically:

Alcohol Consumption Abuse	Nutrition
Cancers (Breast, Cervical and Colon)	HIV/AIDS
Coronary Artery Disease	Immunizations & Infectious Diseases
Depression	Inactivity
Diabetes	Injuries

As mentioned earlier, GHC identified four initial clinical roadmaps, one of them being diabetes. Like tobacco use, a critical element of success in diabetes management was to identify desired long-term health outcomes as well as specific processes-of-care outcomes to ensure GHC was building the appropriate infrastructure to meet its overall goal. This meant determining the prevalence of diabetes in the population and the prevalence of modifiable risk factors such as smoking, high glycohemoglobin levels, obesity, and lack of foot and retinal exams and then determining those elements within the care process that could most effectively reach that population.

During the initial planning of this roadmap, it was determined that most diabetes care is delivered by family practitioners rather than specialists. To deliver effective education and behavioral intervention many questions need to be asked and answered about the patient's health behaviors, symptoms, and support needs. In addition, there is the expectation the provider team will be able not only to answer questions but also effectively counsel the person about behavior change. However, few have enough time in a typical encounter to address all the educational and behavioral needs of a person with diabetes.

The initial plan to improve diabetes education was therefore to redesign patient visits. The visits were designed so that persons with diabetes were seen in clusters, with small group and individual nursing education visits tied to the physician visit. This group format allowed nurse educators and doctors to see a maximum number of patients with similar issues within a relatively small time window. Having many diabetes patients coming to the clinic at the same time also encouraged medical staff to prepare appropriately for the needs of that particular population. This approach is still being evaluated in a randomized controlled trial at GHC. An initial evaluation showed that providers found the approach very helpful and patients found the experience satisfying. Implementing the cluster visit approach, however

was not without its logistical difficulties in the chaotic Primary Care environment. There was need for adjunct support systems to augment behavior change capabilities of the cluster visit approach. The diabetes team, working with the team that operationalized the FREE & CLEAR program, developed a new diabetes education and behavioral intervention program called The Right Track.

The Right Track is designed to provide both the basic education and ongoing behavior-change programming needed to help patients manage their diabetes. Using Certified Diabetes Educators and behavioral change specialists, the program is able to take the meal and monitoring plans and any information about physical activity provided by the patients' physicians and, over 15 months, help patients and their families create and maintain behavior change. Preliminary data show that participants reduced their average blood glucose levels and made significant changes in their diet, physical activity, and self-monitoring behaviors. Though much more research remains to be done, the results are encouraging.

A diabetes registry was developed on our computer workstation that tracked individual data. This data could be used both at individual patient encounters and to generate exception data of patients in need of services such as retinal screening. Who does the population work is still being determined. Additional innovations in computer technologies may be able to improve shared decision making between patient and physician. Other strategies for dissemination of educational materials and health behavior management and care management are being explored. It is too early in the process to suggest that sweeping permanent positive changes have occurred in the GHC diabetic population. However, there is reason to be excited by the potential of this population-based approach to improving health outcomes.

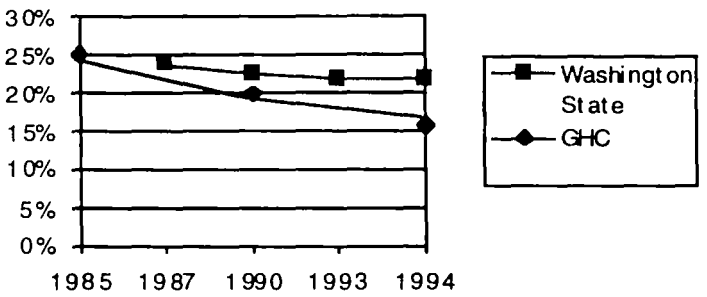
CONCLUSION

GHC's experience with applying a population-based multisystem approach to tobacco use reduction has shown great promise. We are actively engaged in applying this approach to other areas, such as diabetes. But condition-specific system design and implementation requires a lot of work. Developing numerous isolated programs is unlikely to be fundable or sustainable. Future delivery of quality preventive services, behavior change support and patient education will require the development of an integrated cohesive system that addresses issues ranging from primary prevention such as exercise and diet, screening for cancers, and tertiary prevention of chronic disease progression in a seamless holistic manner. Such a health improvement system will take into account evidence regarding specific content areas, as well as what is known about evidence regarding individual behavior change support. It will take full advantage of communication technologies such as regular individually customized risk assessments (that include stages of change, readiness-to-learn, learning-style indicators and follow-up), computerized remind systems, tailored print interventions, easily accessible telephonic support (including interactive voice response), and inter/intranet and web tv sites that support health education, self-care, and behavior change.

Carefully integrating these new support capabilities and technological improvements with the existing healthcare system, such as by having just-in-time clinical reminders and patient education support available to providers, will be an important challenge. Ensuring that staff with training in behavior change support skills such as motivational interviewing and health education are built into the expanded healthcare team will also be important. These and other technological innovations offer ways to make it easier for patients to become active members of their health care team. Exploring new ways to coordinate and deliver an optimal mix of interventions and support to improve patient health while controlling or reducing costs will continue to be an exciting area for research and development.

Figure 1

Percent of Adults
Currently Smoke



References:

[1] U.S. Department of Health and Human Services. Healthy People 2000: national health promotion and disease prevention objectives. Washington D.C., U.S. Department of Health and Human Services, Public Health Service, 1990. DHHS Pub. No. (PHS)91-50212.
[2] Johnson R, Teeter D. The roadmap for clinical quality. HMO Pract 1994;8(1).
[3] Thompson RS, McAfee TA, Stuart ME et al. A review of clinical prevention services at Group Health Cooperative of Puget Sound. Am J Prev Med 1995;11(6):409-416.
[4] McGinnis MJ, Foege WH. Actual causes of death in the United States. JAMA 270:2207-2212, 1993.
[5] McAfee TA, Curry S, Dacey S, Sofian N, Wilson, J, Zeidman L. Decreasing Tobacco Use At Group Health Cooperative during the 1990s: a report to the Committee on Prevention by the Tobacco Use Committee. Internal Group Health Document, July 1991.
[6] AHCPR Smoking Cessation Guideline - Smoking Cessation Guideline Panel. JAMA 1996: 275(16).
[4] Prochaska JO, Velicer WF. The Transtheoretical Model of Health Behavior Change. American Journal of Health Promotion, Vol. 12, No 1., Sept/Oct 1997.
[8] McAfee T, Wilson J, Dacey S. Awakening the sleeping giant: Mainstreaming efforts to decrease tobacco use in an HMO. HMO Pract 1995;9:138-46.
[9] Orleans CT, Schoenbach VJ, Wagner E, et al. Self-help quit smoking interventions: effects of self-help materials, social support instructions and telephone counseling. J Consult Clin Psychol 59: 439-448, 1991.
[10] Hurt RD, Sachs DPL, Glover ED et al. A comparison of sustained-release bupropion and placebo for smoking cessation. N Eng J Med 1997;337(17):1195-1202.
[11] Glynn TJ, Manley MW. How to help your patients stop smoking. A National Cancer Institute Manual for Physicians. Smoking and Tobacco Control Program, Division of Cancer Prevention and Control, National Cancer Institute and the U.S. Department of Health and Human Services, Public Health Service, National Institute of Health; NIH publication no. 92-3064. Washington, DC;PHS, 1991
[12] Elders, JM. Preventing Tobacco Use Among Young People. A Report of the Surgeon General, U.S. Department of Health and Human Services, 1994.

Treating Tobacco Dependence in the U.S.:
Ad Hoc Group
Findings and Recommendations

February 11, 1998

Center for the Advancement of Health
2000 Florida Avenue, NW, Suite 210
Washington, DC 20009
TEL: (202) 387-2829 FAX: (202) 387-2857
WEB: www.cfah.org EMAIL: cfah@cfah.org

Treating Tobacco Dependence in the US:

Ad Hoc Group Findings and Recommendations

CONTENTS PAGE

Introduction 1

Recommendations 2

A. Treatment recommendations

I. Basic Level of Care 3

II. Intensive Treatment 4

III. Improving Quality of Treatment
- a) Treatment Guidelines 5
- b) Proficiency Standards 5
- c) Quality Monitoring 6

B. Other recommendations

IV. Use of Funds Designated for...
- a) Research 7
- b) Tobacco Use Prevention and Control Activities 8

Appendices
- a) List of Ad Hoc Group Members 9
- b) Reviewers 10
- c) Resources 11

About this paper: *This paper represents the efforts of a group of experts in the science of tobacco control (see Appendix A) who sought to outline a cost effective, science-based strategy for reducing tobacco dependence in the US. Our goal is to ensure that treatment services are of consistent high quality and available. This document does not discuss whether funds should be spent at the federal or state level, but rather, focuses on the investments that are most likely to result in a sustained capacity to deliver effective treatment for tobacco dependence into the future.* *The group gratefully acknowledges the staff and financial support from the Center for the Advancement of Health (which receives core funding from the John D. and Catherine T. MacArthur Foundation and the Nathan Cummings Foundation) and the unrestricted financial support provided by SmithKline Beecham Consumer Healthcare.*

Introduction

Cigarette smoking currently kills nearly 440,000 Americans each year, and up to half of all long-term smokers will prematurely develop debilitating disease.[1,2] Tobacco use is already the leading cause of death and disability in this country.[3] Efforts to prevent young people from taking up smoking are an essential part of a plan to stem this epidemic, but such efforts will only begin to impact death rates after 30 years of successful smoking prevention. Moreover, youth smoking prevention efforts are less successful than they might be, due in part to the ever-present example set by adult smokers.

Most American adult smokers want to stop smoking.[4] Proven, effective behavioral and pharmacological treatments exist for tobacco dependence. These methods were carefully reviewed and promulgated in guidelines from the Agency for Health Care Policy and Research (AHCPR) and related guidelines.[5] Evidence-based tobacco dependence treatments are more cost-effective than interventions that are routinely paid for by insurance, including mammograms and treatment for hypertension and hypercholesterolemia.[6] Indeed, treatment of tobacco dependence has been ranked as the most cost effective of all clinical preventive services.[7] Nonetheless, proven treatments are not widely available or widely used.[8,9] Our national tobacco control policy must make effective treatment available to the widest possible group of tobacco users. We should support treatment not only because it reduces morbidity and mortality and is cost effective, but because current tobacco users *deserve* to see some of the benefits of tobacco industry payments. In effect they will be funding those payments out of their own pockets.

We can make a dramatic impact on the overall rate of tobacco use in the United States by delivering low-cost, low-intensity interventions to large populations of smokers, using existing health-care delivery channels. During medical encounters, attention to tobacco use should be as routine as attention to blood pressure. For instance, providing a brief physician intervention to all smokers could more than double our national annual quit rate.[10]

However, some smokers will continue to require more intensive treatment from trained providers - particularly those smokers with more severe addictions and those facing illnesses and other factors that complicate their care. It is especially critical that effective interventions be available to smokers with conditions such as cardiac disease, vascular disease and diabetes, where immediate reduction in smoking is needed to reduce mortality.

Unfortunately, our nation currently lacks the capacity to deliver effective basic and intensive treatment to those who need it. In allocating funds for treatment of tobacco use, therefore, the number one priority must be to develop the systems, competencies, and resources needed to deliver and monitor integrated, evidence-based basic and intensive treatment to tobacco users. Additional priorities include reducing financial barriers to obtaining intensive services and proven medications for disadvantaged populations and the uninsured; and ensuring that treatment is provided based on the best available effectiveness and cost-effectiveness data, and that programs and professionals are held to consistent quality standards.

While this document focuses on the need for clinical treatment services, the ad hoc group would be remiss if we did not also discuss the central contributions of programs in research and in tobacco prevention and control for supporting and improving efforts to reduce tobacco dependence.

Recommendations

Funds should be used as follows:

A. TREATMENT RECOMMENDATIONS

1) The major portion of the funds (e.g., 65%) should be used to build and maintain the capacity of health care systems to deliver and monitor, as a part of routine medical care, "basic" tobacco treatment interventions to all who use tobacco products. Basic treatment capacity-building includes:

- emphasizing evidence-based basic interventions as the standard of care for all clinicians, and providing other support to ensure routine assessment and screening of tobacco use;
- implementing tobacco-user identification and monitoring systems in every office and clinic;
- ensuring that clinicians and patients have needed treatment resources (e.g., funds to support staff whose duties are to enhance integration of tobacco use interventions into clinical services, to support reminder systems, and to reduce cost barriers for efficacious, evidence-based patient aids and pharmacotherapies).

2) A smaller portion of the funds (e.g., 25%) should be used to develop capacity for the delivery of "intensive" treatment services to smokers who require it, and to ensure access to such care for underserved populations. Intensive treatment capacity-building includes:

- establishing and implementing referral protocols for people needing intensive treatment;
- training providers to deliver intensive treatments;
- ensuring that care is culturally appropriate and is relevant to those with particular conditions, by increasing training and promoting targeted programs;
- reimbursing delivery of intensive treatment for low-income, uninsured, and publicly insured populations.

3) Funds should also be used (e.g., 10%) to enhance the quality of both basic and intensive treatment services by establishing procedures for: a) ensuring that treatment is provided based on the best available effectiveness and cost-effectiveness data; b) developing model standards for training, certifying or licensing professionals who deliver intensive treatment services; c) monitoring program impact.

B. OTHER RECOMMENDATIONS

4) In addition to the funds to be set aside for treatment of tobacco dependence, we recommend that: a) substantial portions of research funds be dedicated to research on tobacco treatment interventions; and b) treatment of tobacco dependence should be integrated within the broader tobacco use prevention and control activities (media, community interventions, public education).

NOTE: The allocations we recommend apply to the startup period of capacity-building, and should be altered over time to respond to changing circumstances.

I. Basic Level of Care

Recommendation 1: The major portion of the funds (e.g., 65%) should be used to build and maintain the capacity of health care systems to deliver, as a part of routine medical care, "basic" tobacco treatment interventions to all who use tobacco products.

Goal:
Funding should be provided to support grants for programs to establish or maintain a basic level of treatment intervention (e.g., regular assessment, clinician advice, FDA-approved pharmacotherapies) for all tobacco users in all health care settings, public (including the Indian Health Service, military, HRSA community clinics, Medicare, and Medicaid) and private.

Rationale:
Seventy percent of smokers see a clinician each year.[11] If clinicians provided brief interventions to all smokers, we could more than double our national annual quit rate.[12] The addition of brief behavioral counseling and pharmacotherapy could more than triple the national annual quit rate.[13],[14] Because basic interventions can have such a powerful effect at the population level, they are promoted as the standard of care by health organizations including the National Committee for Quality Assurance, the American Medical Association, the American Academy of Family Physicians, and the American Cancer Society. The basic recommendation is that all health care clinicians (including physicians, nurses, dentists, respiratory therapists, health counselors) take the following steps with all of their patients:

Ask -- systematically identify all tobacco users at every visit;
Advise -- strongly urge all tobacco users to quit;
Assist -- with brief (3-5 minutes) behavioral counseling, treatment materials and the recommendation/prescription of appropriate pharmacotherapy;
Arrange -- follow-up support and/or referral to more intensive treatments if needed;
Anticipate -- assess and intervene to reduce the risk for tobacco use for children.

Investing in the *capacity* for delivering a basic level of treatment intervention rather than in paying individual clinicians for each encounter is important for three reasons. a) The system currently lacks the capacity to treat smokers effectively. b) Tobacco funds are not likely to be available in perpetuity. Raising the ability of health care systems to provide basic treatment is more likely to ensure continuation of service delivery when those funds dry up. c) When office- and plan-level capacity is present, insurers and health plans will be more likely to provide incentives to providers, since they will be assured of good quality, effective interventions by trained clinicians.

Implementation:
Funds shall support the systems, competencies and resources (including staff and patient treatment aids) needed to ensure that this standard of care can be incorporated into basic medical care. For instance, funds would be awarded to publicly- and privately-funded health care systems, clinics, provider organizations and health plans for the following types of activities and resources (as well as others that evidence may later support):

- ensuring that clinicians understand recommendations for basic treatment;
- ensuring that clinicians and patients have needed treatment resources (e.g., funds to support staff whose duties are to enhance integration of tobacco use interventions into clinical services, to support reminder systems, or to reduce cost barriers for efficacious, evidence-based patient aids and pharmacotherapies);
- implementing tobacco-user identification and monitoring systems in every office and clinic;
- creating information systems to monitor and evaluate the degree to which health care systems are meeting this basic standard of care.

II. Intensive Treatment

Recommendation 2: A smaller portion of the funds (e.g., 25%) should be used to develop capacity for the delivery of "intensive" treatment services to smokers who require it, and to ensure access to such care for underserved populations.

Goal:
Funding should be provided to establish and maintain intensive tobacco treatment interventions so that services are available to all who need more intensive care.

Rationale:
While basic, low-cost interventions in medical settings are likely to reach the majority of tobacco users and yield by far the largest number of quitters, many tobacco users will require more intensive treatment, which should be delivered by providers with demonstrated proficiency in treating tobacco use. [15] Those in need of intensive treatment are often those tobacco users at greatest risk for death and disease, making intensive intervention highly cost-effective.[16] Intensive treatment of tobacco use depends on the knowledge of tobacco dependence, pharmacologic treatments, counseling and other behavioral support techniques, recognition of co-existing conditions, criteria for determining the type and scope of treatment required, and other proficiency-dependent factors.

In general, intensive interventions will involve a combination of components, including multiple treatment encounters, application of both behavioral and pharmacologic interventions, individual or group counseling and follow-up, and treatment of co-existing conditions. Tobacco users in need of such care should be identified and provided with intensive treatment. A system of integrated care should be developed so that smokers referred to treatment have ready, rapid access to validated treatment delivered by providers with demonstrated proficiency.

Implementation:
The primary means of establishing a system of intensive treatment shall be investment in capacity development, such as incentives for development of treatment resources, networks, model programs, and funds for training of providers. Provider training shall include ways to meet special needs of clients with particular health conditions and problems including cardiovascular disease, diabetes, and psychiatric or substance use problems, and those staying in hospital settings. Providers from diverse ethnic and cultural backgrounds shall be trained, and training for all shall include components on cultural and linguistic appropriateness. Model programs shall include programs targeted to particular minority groups, and those targeted to people with particular health conditions such as those noted above.

In addition to creating systems, funds must be used to reduce financial barriers to treatment access. Funds shall be provided to reimburse delivery of intensive treatment through Medicaid and Medicare, the Indian Health Service, and, for people who lack basic health insurance coverage, through community clinics run by HRSA, health departments, etc. Incentive programs to encourage health plans and third-party payers to establish or expand and maintain coverage for these services shall be studied, and if appropriate, implemented.

III. Improving the Quality of Treatment for Tobacco Dependence: a) Treatment Guidelines; b) Proficiency Standards; c) Quality Monitoring

Recommendation 3: Funds should be used (e.g., 10%) to enhance the quality of both basic and intensive treatment services.

Goal:
To ensure that the treatment (both basic and intensive) available to tobacco users is of the highest quality and represents proven state-of-art treatment modalities.

A) Treatment Guidelines

Rationale:
Proven effective treatment interventions for tobacco dependence have been defined; however these interventions are not being widely implemented. In addition, treatments that have little or no evidence to support their efficacy are marketed to smokers. The treatment programs and initiatives supported by federal legislation must be based on current, best available scientific evidence. Efforts must be made to ensure that funds are not diverted to unproven or ineffective treatment.

Research continually documents improvements in treatment techniques that must be systematically incorporated into standard care. Current best evidence regarding the treatment of tobacco dependence is summarized in the 1996 AHCPR clinical practice guideline. However, there should be a mechanism to update and promulgate new tobacco treatment guidelines as new and more effective treatments are developed, so that the treatment being delivered continues to reflect the best available knowledge.

Implementation:
A system shall be established and maintained for updating and promulgating tobacco treatment guidelines.

B) Proficiency Standards

Rationale:
Tobacco users must have access to providers who are knowledgeable and proficient regarding the proven state-of-the-art treatment modalities. Tobacco dependence involves complex pharmacologic and behavioral factors, and successful intensive treatment requires unique knowledge and skills related to these factors. Health professions education curricula generally do not provide formal programs or training in treatment of tobacco use, nor are there standardized criteria for intensive training or continuing medical education in this area. Although there are health professionals and lay counselors who provide treatment to tobacco users, there are very few, and there is no way for consumers, third party payers and health systems to determine whether these individuals possess the requisite knowledge and skills. Further, no single health profession or specialty uniquely possesses the proficiencies needed for tobacco use treatment.

Given the need to provide quality care, proficiency standards are essential. While states should have the latitude to establish their own mechanisms for testing and recognizing proficiency, such systems should be based on national standards.

Basic treatment of tobacco dependence should be standard in the training of physicians, dentists, nurses and allied health professionals.

Implementation:
Within two years of implementation of provisions for tobacco use treatment, the Secretary shall develop and promulgate to States model standards for training, certification, or licensure of health professionals and others engaged in the delivery of intensive tobacco treatment services. These model standards should build on the successes of existing professional education efforts.

C) Quality Monitoring

Rationale:
Although there is good evidence from the AHCPR guidelines regarding the critical elements of tobacco treatment that increase success, there is less evidence available regarding the best mechanisms for incorporating these elements into a delivery system with the capacity to triage and to match smokers to the most effective and efficient mix of services. An essential activity under federal legislation should promoting the integration of quality control for tobacco with quality assurance for other clinical interventions. This monitoring system must be able to incorporate new scientific developments in the treatment of tobacco use. Thus, it is essential that programs (both basic and intensive) funded under the federal legislation include monitoring mechanisms. This monitoring will allow programs to provide feedback to providers, health system administrators, purchasers, regulatory agencies, and accrediting organizations in order to improve the quality of the services being provided to tobacco users. Dissemination of best practices regarding the implementation of proven tobacco treatment is also essential.

Implementation:
Funding for programs shall be contingent upon the programs including a reasonable method for monitoring the efficacy of the program. Publication and dissemination of effective methods for implementing treatment guidelines is encouraged.

IV. Use of Funds Designated for: a) Research; and b) Tobacco Use Prevention and Control Activities

Recommendation 4: In addition to the funds to be set aside for treatment of tobacco dependence, we recommend that: a) substantial portions of research funds should be dedicated to tobacco interventions; and b) treatment of tobacco dependence should be integrated within the broader tobacco use prevention and control activities (media, community interventions, etc.).

A) Use of Research Funds

Goal:
To prevent harmful effects of tobacco by developing improved treatments through an expanded research effort.

Rationale:
Research on the process and treatment of tobacco dependence has greatly advanced our ability to help smokers achieve cessation and reduce their risk of debilitating diseases. Just two decades ago, there was no system for the medical diagnosis of tobacco dependence and withdrawal, and no effective medicines for treating tobacco dependence or withdrawal symptoms. Today, as a result of research, there are well validated systems for assessing and treating tobacco dependence. We have achieved impressive results through combined pharmacological and behavioral approaches.

However, existing treatments may be ineffective or unacceptable for some people. For example, research on the development of effective treatments for people with psychiatric disorders and other forms of drug dependence is in early stages though already beginning to provide clinical guidance. Federally-supported research on the special treatment needs of tobacco-dependent youth, the elderly, and adaptation of proven methods to minority populations has been almost nonexistent. Little research has been supported on treatment for smokeless tobacco users and virtually none at all has been targeted to cigar and pipe smokers. Finally, research on reducing the harms of tobacco exposure, as well as research to improve the integration of behavioral and pharmacologic treatment approaches and to determine the most effective combination of approaches could substantially contribute to the health of our nation, but currently find little Federal support.

Implementation:
Treatment-focused research must be substantially expanded in the following areas:

- assessing and treating tobacco-dependent youth, including those addicted to various forms of tobacco such as smokeless tobacco, cigarettes, and cigars;
- enhancing treatment effectiveness among other high-risk or poorly studied populations;
- evaluating new and innovative treatments including exposure reduction and pharmacotherapies;

- approaches to expanding the acceptability, reach, utilization, and adherence to treatment, approaches to understanding treatment failure, and approaches to improving integration of relevant services into general health care settings;
- provider incentives to deliver effective treatments.

It is critical that new moneys for treatment research actually expand treatment research, increase research productivity, and not be diverted or used to replace existing funds.

B) Coordination with Tobacco Use Prevention and Control Activities:

Goal:
Clinical tobacco-use interventions need to be coordinated with other tobacco use prevention and control activities (public health tobacco-use interventions, media messages promoting tobacco treatment, and policy interventions that encourage attempts to quit).

Rationale:
Clinical tobacco-use interventions reach only the relatively small proportion of tobacco users ready to take action to quit. In addition, research has shown that many of these tobacco users quit without formal assistance. We could further increase interest in quitting and better support tobacco users' efforts to quit if we increased interventions such as media messages promoting treatment of tobacco dependence, and policy changes such as clean indoor air laws and a substantial increase in the price of cigarettes. In addition, smokers' access to proven interventions - particularly for those smokers who do not regularly use the health care system - could be improved by increasing funding for public health interventions such as telephone hotlines, referral services, and telephone counseling services.

Implementation:
Agencies that fund the various aspects of the tobacco legislation (media, community and public health interventions, and clinical interventions) shall be urged to integrate activities that support treatment as part of their overall efforts. They shall also be required to coordinate their activities in order to maximize the reduction in tobacco use.

Appendix A: Ad Hoc Working Group Members*

John M. Pinney, Chair, Ad Hoc Working Group
President
Pinney Associates, Inc.

Thomas Glynn, Ph.D.
Director of Cancer Science and Trends
American Cancer Society-National Office

Jessie Gruman, Ph.D.
Executive Director
Center for the Advancement of Health

Dorothy Hatsukami, Ph.D.
Professor
University of Minnesota
Department of Psychiatry, Division of Neurosciences

Jack E. Henningfield, Ph.D.
Associate Professor
Department of Psychiatry and Behavioral Science
Johns Hopkins University School of Medicine
and
Vice President, Research and Health Policy
Pinney Associates

Jack Hollis, Ph.D.
Director, Epidemiology and Disease Prevention Program
Kaiser Permanente Center for Health Research

Roni Neff, M.H.S.
Outreach Coordinator
Center for the Advancement of Health

Saul Shiffman, Ph.D.
Professor of Psychology
Director, Smoking Research Group
University of Pittsburgh

John Slade, M.D.
Professor of Clinical Medicine
St. Peter's Medical Center
Robert Wood Johnson Medical School
University of Medicine and Dentistry of New Jersey

*Affiliations listed for identification purposes only.

Appendix B: Reviewers*

Jasjit Singh Ahluwalia, MD
Associate Professor
University of Kansas Medical Center

Gregory Connolly, D.M.D., M.P.H.
Director
Massachusetts Tobacco Control Program
Massachusetts Department of Public Health

Susan Curry, Ph.D.
Associate Director
Center for Health Studies
Group Health Cooperative of Puget Sound

Michael Fiore, M.D.
Associate Professor, Department of Medicine
Director
Center for Tobacco Research Intervention
University of Wisconsin Medical School

Thomas Houston, M.D.
Director
Department of Preventive Medicine
and Environmental Health
American Medical Association

John Hughes, M.D.
Professor
Department of Psychiatry
University of Vermont

George Isham, MD
Medical Director
Health Partners

C. Everett Koop, M.D.

Jeff Koplan, M.D.
President
Prudential Center for Health Care Research

J. Michael McGinnis, M.D.
Scholar-in-Residence
National Research Council

Robert Mullan Cook-Deegan, M.D.
Director, National Cancer Policy Board
Institute of Medicine
and Commission on Life Sciences
National Academy of Sciences

Judith Ockene, Ph.D.
Professor of Medicine
Div. of Prev. and Behavioral Medicine
University of Mass. Medical Center

Leif Solberg, M.D.
Health Partners
Group Health Foundation

Susanne Hildebrand-Zanki, Ph.D.
Director
Tobacco Related Disease Program
University of California-Berkeley

* Inclusion in this list does not constitute an individual or organizational endorsement.

Appendix C: Resources for further Information

1. ENDNOTES

[1] Centers for Disease Control and Prevention: Smoking-attributable mortality and years of potential life lost - United States, 1984 (Reprint of landmark article with update). *MMWR* 46(20):444-51, 1997.
[2] Thun MJ, Day-Lally CA, Calle EE, Flanders WD, Heath CW: Excess mortality among cigarette smokers: changes in a 20 year interval. *American Journal of Public Health.* 85(9):1223-30, 1995.
[3] McGinnis JM, Foege WH: Actual causes of death in the United States. *JAMA* 270(18):2207-12, 1993.
[4] Centers for Disease Control and Prevention, 1997.
[5] U.S. Department of Health and Human Services. Smoking cessation: clinical practice guideline. AHCPR Publication No. 96-0692. Rockville, MD: United States Department of Health and Human Services, Public Health Service, Agency for Health Care Policy and Research and Centers for Disease Control and Prevention, 1996.
[6] Cromwell J, Bartosch WJ, Fiore MC, Hasselblad V, Baker T: Cost-effectiveness of the clinical practice recommendations in the AHCPR guideline for smoking cessation. *JAMA* 278(21):1759-66, 1997.
[7] Eddy DM. David Eddy ranks the tests. Harvard Health Letter. July 1992:10-11.
[8] Fiore MC, Novotny TE, Pierce JP, et al. Methods used to quit smoking in the U.S.: Do cessation programs help? *JAMA*, 263(20):2760-65, 1990.
[9] Centers for Disease Control and Prevention. Cigarette smoking among adults - United States, 1995. *MMWR* 46(51):1217-20, 1997.
[10] U.S. DHHS, 1996.
[11] Tomar CL, Husten CG, Manley MW. Do dentists and physicians advise tobacco users to quit? JADA 127:259-66, 1996.
[12] U.S. DHHS, 1996.
[13] Ockene JK, Kristellar J, Goldberg R., Amick TL, Pekow PS, Hosmer D, Quirk M, Kalan K. Increasing the efficacy of physician-delivered smoking interventions: a randomized clinical trial. *Journal of General Internal Medicine.* Vol. 6:1-8, 1991.
[14] U.S. DHHS, 1996.
[15] U.S. DHHS, 1996.
[16] Cromwell et al.

2. OTHER RESOURCES

Advocacy Institute. Sections from *Evaluating the Proposed Settlement: A comparison with the Koop-Kessler Report and with current public policies and efforts*, August, 1997.

National Cancer Policy Board, Institute of Medicine and Commission on Life Sciences, National Research Council. *Taking Action to Reduce Tobacco Use.* December 1997.

Society for Behavioral Medicine. *Policy Statement Regarding National Tobacco Control Efforts*, November 1997.

Society for Research on Nicotine and Tobacco. *SRNT Policy Statement: The Importance of Research in the Development of National Tobacco Control Efforts*, July 1997.

AHCPR Smoking Cessation Guideline: Its Goals and Impact: Proceedings of a National United States Conference. *Tobacco Control.* Autumn 1997, Volume 6, Supplement 1.

Smoking Cessation: Alternative Strategies: Proceedings of a National Conference. *Tobacco Control.* Autumn 1995, Volume 4, Supplement 2.