A study was conducted to test the potential influence of a physician on the smoking behavior of his patients. The results seem to indicate that a physician may influence patients to give up smoking. It is recognized that the results are preliminary and several aspects of patient-physician interaction are suggested for further study.

THE INFLUENCE OF A PHYSICIAN ON THE SMOKING OF HIS PATIENTS

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SMOKING, in particular the smoking of cigarettes, is now widely recognized as a major hazard to health.[1] The past few years have witnessed numerous efforts to reduce smoking. Because of the large numbers of people concerned, these efforts have consisted mainly of attempts to work with groups. Prominent among them have been educational programs in school systems[2-4] and antismoking clinics.[5,6]

The limited effects of education in producing change in smoking behavior have been apparent. The widespread publicity attendant upon the release of the Surgeon General's report led only to a temporary drop in consumption of cigarettes. One of us (B. Mausner) found that even when significant learning and attitude change about smoking were produced through programed instruction, the amount of concomitant change in behavior was negligible.[7]

The general success of antismoking clinics reported on long-term follow-up has been relatively low. For example, long-term follow-up of a series of antismoking clinics at Roswell Park[8] showed that, over-all, 17 per cent of the participants had quit smoking. However, of greater importance is the fact that these clinics have uniformly handled volunteers, a self-selected group of smokers who have decided to make an attempt to stop.

The importance of the difference between a total group of smokers and a self-selected subgroup willing to attend an antismoking clinic can be seen in the experience of the Philadelphia Smoking and Health Project.[9] This organization decided to focus its efforts on the parents of children attending grade schools in one school district of Philadelphia. Approximately 11,000 parents identified themselves as smokers on questionnaires. Although 4,800 indicated an interest in attending a series of antismoking clinics, only 150 actually attended the clinic and, on follow-up, 56 had abstained from cigarettes for at least six months. This reduction in numbers at each step in the process is a sharp reminder of the danger of overestimating the effects of reducing smoking in a group of volunteers in terms of the total magnitude of the problem.

The above limitations make it important to search for alternate methods

NOTE: A preliminary version of the data was included in a paper presented at the 1966 National Research Conference on Smoking Behavior at the University of Arizona and published in the proceedings of that conference, University of Arizona Press, 1967.

of encouraging smokers to quit smoking. A direction for this search may be found in the work of sociologists on personal influence. One of the most thorough sociological studies of influence[10] concluded that influence on decision is most potent when it comes from individuals who are both authoritative and involved in personal interaction with the person to be influenced. In behavior related to health, the most appropriate person to apply influence is the practicing physician. The effectiveness of a physician in exerting this kind of influence has been demonstrated by Bass and Wilson[11] who reported that telephone messages from a "safety organization" and letters from pediatricians were relatively ineffective in influencing people to purchase seat belts for their automobiles compared to a brief recommendation about seat belts by a pediatrician during the customary interactions of a routine office visit. A significantly higher proportion of the subjects who had heard about seat belts from their doctor in the office installed them compared to those in the control groups. To test the effectiveness of a physician's influence on his patients' smoking behavior, the following study was undertaken.

The Study

Ideally, for an experimental study of physician-influence all patients should be assigned by random allocation to the experimental or the control group. This did not seem feasible for the current study because it would have introduced too much manipulation into a busy office routine. Therefore it was decided that one of us (W.Y.R., the "study physician") would attempt to influence the smokers among his patients ("study group") to stop smoking. The patients of the physician who shares his office were designated as a comparison group. It was expected that both sets of patients would be comparable.

Both men carry on general practice in a college town close to Philadelphia. Both were strongly convinced by the evidence that smoking and disease were linked. Both had engaged in intensive attempts to influence their patients shortly after the publication of the Surgeon General's report. However, at the time of the study neither was routinely discussing smoking with every patient. Thus they probably treated smoking much as it is handled by the majority of American physicians.

All patients who came to their office in July and August, 1965 were given a questionnaire by the receptionist before contact with their doctor. Questions were asked as to type of smoking, amount usually smoked, and lifetime smoking history in a format developed by Ravenholt and Applegate.[12] In addition, inquiry was made about several items of personal information.

The study physician spoke briefly with each patient about smoking, except where a medical emergency intervened. He asked whether the patient smoked and indicated that smoking is harmful to health. He offered a small supply of Nicoban, a lobeline preparation, and a pamphlet to all patients who indicated an interest. The pamphlet gave specific directions to assist people attempting to stop smoking. The study physician engaged in no detailed discussion of the effects of smoking except with a few patients who wanted to discuss the problem in depth.

Approximately one week after the office visit, a trained interviewer called the smokers to inquire about smoking behavior during the previous day and since the office visit. The interviewer did not know which physician the patient had seen. Several questions were asked about the patient's pattern of smoking and the rewards obtained from smoking. The degree to which smoking was related to social activity and the level of affective involvement in smoking were both classified on two four-point scales (Table 1), the latter of

which was based on a theoretical model proposed by Tomkins.[13] Approximately six months afterwards the patients were again called and queried about their smoking behavior.

Four hundred and forty-one questionnaires were given to people entering the waiting-room shared by the two physicians. Of these, 31 were eliminated because they submitted incomplete questionnaires; 253 were nonsmokers or exsmokers. Thus 157 smokers were available for the study, 121 in the study group and 36 in the comparison group. One hundred and forty-five of these were reached for both follow-up interviews, 113 in the study and 32 in the comparison group. During the course of the interviews 20 individuals were removed from the study population because there was reason to doubt that they had actually received a message from the physician. The final population consisted of 93 smokers in the study group and 32 in the comparison group (Follow-up II). Subjects were placed in two categories, those who stopped or reduced smoking and those who either maintained or increased their level of smoking. Reduction was defined as a decrease of at least one-half pack of cigarettes per day.

The study and comparison groups were generally similar in regard to sex, age, occupation, and education. In large part they were from clerical, sales, or skilled craft occupations, with a sizable minority of professional and technical people. The proportion of smokers in the two practices was the same, 39 per cent in each. However, there was a much higher proportion of heavy smokers in the study than in the comparison group (Table 2). We cannot account for this difference. The smoking histories indicate that it did not result from a marked decrease in smoking by the comparison group prior to the study.

On the initial follow-up, approximately 40 per cent in both groups reported some decision to change their smoking habits.

Table 1—Code for analysis of smoking patterns

A. Level of affective involvement
- 0. No answer or doesn't know
- 1. Habit
  - a. Something to do
  - b. Absolutely nothing
  - c. Dieting (crutch, and so on)
  - d. Strictly social
  - e. Nothing from it
  - f. Just feel like smoking
- 2. Pleasant
  - a. Like the taste
  - b. Satisfaction
  - c. Enjoyment
- 3. Tension release
  - a. Excuse to sit down and do nothing
  - b. Relaxation
- 4. Addiction
  - a. Physical need

B. Level of social involvement in smoking
- 0. No answer
- 1. Solitary
  - a. Smokes more alone
- 2. Moderate
  - a. About the same with or without people
- 3. Fairly important
  - a. More with others
- 4. Crucial
  - a. Only smokes socially
  - b. Social crutch
  - c. Definitely more socially

(If subject mentions more than one aspect, highest named rating is assigned.)

Table 2—Reported levels of smoking on initial questionnaire (Follow-up I Group)

Number of cigarettes smoked per day	Study group	Comparison group
<10	10 (9%)	7 (20%)
10–19	19 (16%)	11 (31%)
20–29	44 (36%)	15 (42%)
30–39	28 } (40%)	2 } (8%)
40 and up	20 }	1 }
Total	121	36

Table 3—Number of subjects reporting decrease or no decrease in smoking (Follow-up II Group)

Group	Decrease	No decrease	Total
Study	31 (33%)	62 (67%)	93 (100%)
Comparison	3 (9%)	29 (91%)	32 (100%)
Total	34	91	125

However, a higher proportion in the study group actually did reduce consumption of cigarettes, 45 per cent compared to 25 per cent. The difference between the two groups was more marked after six months (Table 3).

Thirty-one persons in the study group decreased the amount smoked. Of these, the three who initially smoked less than half a pack per day stopped completely. There were seven smokers whose intake was approximately one pack per day. Of these, four reduced to half a pack and three to even lower levels. The 11 subjects whose initial smoking level was one and one-half packs all reduced to one pack per day. The ten smokers who consumed over one and one-half packs per day showed a median reduction of one pack per day, with two patients eliminating smoking almost entirely.

The relation between decision and actual change is obscure. Of those who decreased, only slightly more than half had previously indicated an intention to change. However, decrease in smoking on the first follow-up was predictive of continued reduction in smoking (Table 4).

Within the study group the average initial level of smoking was significantly higher among those who changed than among those who did not ($t=3.05$, $n=91$, $p<0.01$). They also had a heavier lifetime burden of smoking, an index calculated as the product of amount smoked per year times the number of years smoked ($t=2.30$, $n=86$, $p<0.05$). There was a tendency of borderline significance for proportionately more of the men to change than the women. However, within each sex it was the heavier smokers who changed (Table 5). There were no significant differences in age of starting to smoke or in numbers of years of smoking. Reported decrease was also not related to age nor to occupational or educational level.

Table 4—Decrease on Follow-up II related to decrease on Follow-up I (study group)

		Follow-up II		
		Decrease	No decrease	Total
Follow-up I	Decrease	21	23	44
	No decrease	10	39	49
	Total	31	62	93

$\chi^2=7.79$, $df=1$, $p<0.01$.

Table 5—Number of study subjects decreasing or not decreasing smoking by sex

Group	Decrease	No decrease
Male		
	N=14 (M=33.3*)	N=16 (M=24.7*)
Female		
	N=17 (M=27.1*)	N=46 (M=21.2*)

* M=mean number of cigarettes smoked initially.
$\chi^2=3.54$, df=1, $p<0.10>0.05$.

The ratings of social and affective factors obtained in the first telephone interview were independent. There was a slight tendency for change to occur more frequently among subjects who rated high on emotional factors in smoking than among those who indicated smoking had little or no affective import. However, social factors were significantly related to tendency to change. A smaller proportion of those whose smoking was largely social decreased compared with those whose smoking was largely solitary (Table 6). In addition, the more solitary smokers who decreased smoked more heavily than the social smokers who decreased. There was no such relation between amount of smoking and rating on social scale among the subjects who did not change. As Table 7 demonstrates,, the relation of social factors to tendency to change is independent of smoking level. For the heavy smokers, i.e., one and one-half packs per day or more, a significantly higher proportion of solitary smokers was found among those who decreased. Thus both a tendency toward solitary smoking and a heavy level of smoking seemed to be related independently to tendency to decrease. There is one additional minor point regarding the importance of social support for continued smoking. In none of the six married couples in the study group where both partners smoked did either partner diminish the level of smoking.

Discussion

The above findings support the thesis that personal influence of a physician can alter smoking behavior. The dissimilarity in proportion of heavy and light smokers in the two practices means that the attempt to conduct an experiment with two comparable groups was not successful. However, this does not appear to vitiate the inference that a physician can potentially influence the smoking behavior of many patients. Despite the initial differences in level of smoking between the two groups, the minimal reductions in smoking in the comparison group over the six-month period of follow-up suggest that the changes observed in the study group exceed random fluctuations. Since there is a possibility that the current findings are dependent on the particular circumstances of the study and of the individual physician concerned, such a study should be extended and replicated with a wider variety of practitioners to control for the unique character of individual patient-physician relations.

The finding of so much immediate effect in the "control" group, i.e., 39 per cent reporting an intention to decrease smoking, was disconcerting at

Table 6—Decrease in smoking (study group) by rating of social factor in smoking

Social factor*	Decrease	No decrease
1	6 M=36.3†	5 M=21.0†
2	14 M=33.3†	19 M=26.2†
3, 4	10 M=22.2†	37 M=20.4†

* A rating of 1 indicates predominantly solitary smoking, 4 mainly smoking with others.
† Mean number of cigarettes smoked prior to contact with physician.
$\chi^2=6.55$, df=2, $p<0.05$.

Table 7—Relation of rating on social character of smoking to decrease among heavy smokers (study group: >1½ packs per day)

Social character	Decrease	No decrease
1	5	0
2	12	8
3, 4	4	8

$\chi^2 = 6.7$, df = 2, $p < 0.05$.

first. However, in the telephone interviews several of the patients in this group reported that filling out a questionnaire on smoking just before a visit to the doctor reminded them that smoking has serious effects on health. The comparison physician is well-known to his patients and in the community as being opposed to smoking; in fact, he had NO SMOKING signs on his office walls! Thus even contact with such a physician in conjunction with a questionnaire on smoking had a noticeable effect, albeit a temporary one.

Two findings require further comment. First, in this study it was the heavy smokers who tended to change. Previous reports have indicated varied patterns of relation between level of smoking and tendency to change.[14,15] The net result of the interaction of several factors may differ in different groups. Light smokers probably find it relatively easy to change; heavy smokers may take persuasive influences more seriously, either because of symptoms or because they view the issue as salient. And second, decrease in smoking was concentrated among smokers whose pattern of smoking was relatively solitary. A low level of social supports for smoking may very well be crucial in an individual's ability to modify his smoking behavior.

The control of smoking is an urgent problem of major dimensions. Since the results of control programs to date have not been encouraging, it is important to explore the potentialities of physician influence. Patient-physician relations are a broad area of study. Several delimited problems within this area should be investigated to determine their relevance to the control of smoking.

In the current study, the physician for the study group has a close personal relationship with his patients. It would be important to determine whether the effect we reported is dependent on this or whether *any* physician, no matter what the background of previous patient-physician relations, could exert a similar effect. The context in which the patient sees the physician could be varied to include groups from health plans, clinics, and industrial or school populations as well as patients from private practices. It would be important to know whether the prestige of a consultant would counteract his limited personal involvement with his patients; the influence of an internist or surgeon could be compared with that of a general practitioner.

A number of variables on the patient's side of the physician-patient relation may be important. Demographic factors such as socioeconomic status, education, religion, or race may affect the willingness of a patient to accept a physician's dicta on smoking. The circumstances which bring the patient to the physician may be important. The impact of the physician may be different in a visit which is part of a screening program or one in which help is sought because of symptomatic illness. Patients with asymptomatic abnormalities on physical examination or laboratory work-up possibly related to smoking may differ in responsiveness from those without such changes.

Different terms have been used by social scientists to describe the relations between the two members of a dyad. The fundamental process may be viewed as one of "suggestion," in which influence flows in only one direction, or of "in-

teraction," in which each actor influences the other. In general, the physician-patient relation is predominantly a one-way process in which the physician seeks to initiate change in the patient. However, since a physician's behavior may be influenced both by the identity of the patient and by the patient's reactions to his suggestions, we prefer to consider it an interaction. Unfortunately, due to the specific circumstances of the current study, we could not search for aspects of the interaction which might have increased or diminished the likelihood that the antismoking message would lead to behavioral change. Where practicable, future studies should include observational or other measures of the nature of the interaction.

Several aspects of the interaction should be examined carefully. Variations in the extent to which the physician actively attempts to rouse anxiety may be studied. It would be desirable to determine the degree to which a physician's influence could be enhanced by the use of educational materials imparting detailed information about the risks of smoking. It may be that such detailed learning, even if it did not by itself change smoking behavior, could potentiate the response to suggestions by a physician. Further, Leventhal[16] demonstrated that a persuasive message is most effective in creating changed behavior if it is accompanied by specific instructions to the recipient. Controlled studies with varied degrees of specificity of direction could be designed to test its applicability to the problem at hand. Lastly, the importance of the placebo effect in the use of antismoking drugs should be evaluated. Potentially the prescription of such drugs legitimizes the notion that smoking is a "disease" and could facilitate change.

In many previous studies emphasis has been placed almost entirely on complete cessation of smoking. While cessation may be the most desirable goal, any reduction in smoking levels certainly should be welcomed. In the current study complete cessation occurred in only a small proportion of the subjects. However, it may be that the initial influence of a physician coupled with other measures such as intensive education or group action could lead to long maintained reduction or, for some, to elimination of smoking.

Future studies should undoubtedly include longer periods of follow-up than the six months employed in the current investigation. It was not practicable for us to continue follow-up past six months. However, we do not feel that this relatively short period was ill-advised. It was long enough to show that change could persist beyond the period of immediate contact with the physician. In view of the complex and continuing influences on smoking behavior in the lives of both the study and comparison groups, continued follow-up would probably yield results decreasingly related to our limited manipulation. In future studies it may be possible to maintain contact with patients not only for purposes of follow-up but also for experimental programs of continued support for the diminution or cessation of smoking.

It should be stressed that meaningful studies on the control of smoking cannot be limited to volunteer subjects. Somehow studies will have to be developed which will draw upon consecutive groups of patients who are not self-selected. This will not be easy but will require the cooperation of practicing physicians and persons skilled in study design and behavioral analysis. However, the urgency of the problem requires that the effort be made.

Summary

Efforts to date to reduce the smoking of cigarettes have generally met with only limited success. Because of this, it seemed important to test the potential

influence of a physician on the smoking behavior of his patients.

A small study was conducted, utilizing the practices of two general practitioners who share an office. One physician urged all the smokers in his practice who came to his office over a two-month period to stop smoking; the other made no special mention of smoking. Follow-up six months after the office visit showed that a higher proportion of patients in the study group than the comparison group had reduced smoking.

Despite the preliminary nature of the data, the results are presented to stimulate further interest and exploration of the role of physicians in the control of smoking. Several parameters of patient-physician interactions are suggested as appropriate for further study.

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