

Documenting Smoking Status

Trial of three strategies

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SUMMARY

A randomized trial at a family medicine center compared three ways of improving the rates of recording patients' smoking behavior: letter, telephone, and reminding physicians to inquire at visits. Telephone produced the highest rate of recordings, while physician reminder was most cost-effective. We recommend physician reminder with telephone calls from the practice nurse for patients who do not attend.

RÉSUMÉ

Un essai randomisé effectué dans un centre de médecine familiale a comparé trois moyens d'améliorer les taux d'inscription au dossier des comportements tabagiques des fumeurs: lettre, téléphone et les rappels aux médecins de ne pas oublier ce renseignement au moment des visites. Le téléphone a produit le plus haut taux d'inscription, alors que le rappel aux médecins s'est avéré le plus rentable. Nous recommandons le rappel aux médecins et les appels téléphoniques faits par l'infirmière praticienne dans le cas des patients qui ne fréquentent pas la clinique.

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BECAUSE OF THE IMPORTANCE of cigarette smoking as a cause of preventable morbidity and mortality, much attention has been paid to the role of family physicians in smoking cessation.¹⁻³ Several studies, principally in Britain, have shown that simple physicians' advice increases cessation rates. North American studies, however, have failed to replicate these findings.⁴⁻⁹

A large-scale study conducted by a group from the Departments of Family Medicine and Clinical Epidemiology and Biostatistics at McMaster University in Hamilton, Ont, and the Department of Health Studies at Waterloo, Ont, determined that a practical, carefully structured intervention for family physicians in their office was effective. In that study, which enrolled smokers selected at random from practices (and thus not necessarily strongly motivated), 7.5% of patients in the intervention group stopped smoking for more than 1 year, compared with 3.5% in the control group.^{10,11}

Therefore, family physicians should be aware of their patients' smoking habits;

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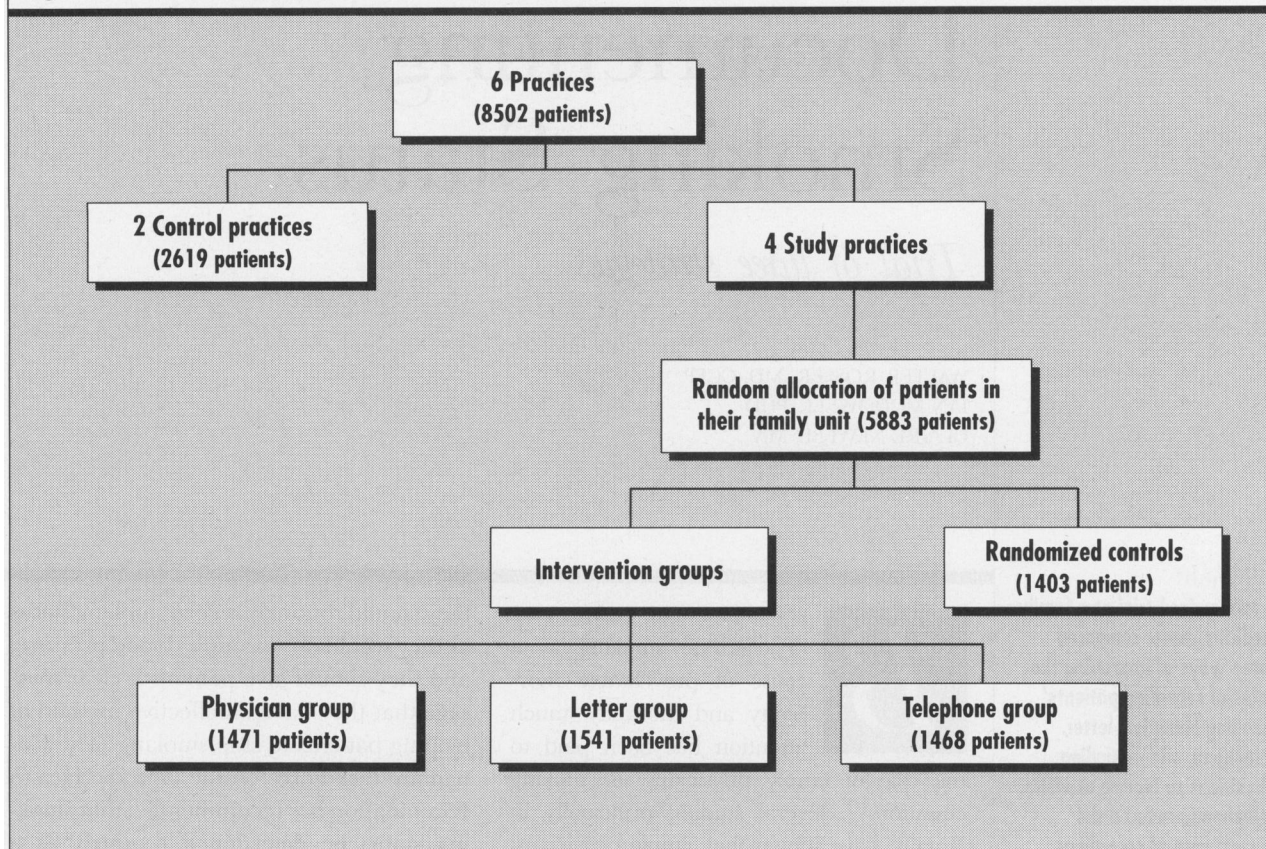
they should routinely record smoking status as they would (for example) blood pressure, and they should give patients a clear message that they have an effective method of helping patients to stop smoking. The Canadian Task Force on the Periodic Health Examination has recommended that smoking status be determined routinely as a case-finding technique when the patient attends for unrelated symptoms.¹²

It is not surprising that most general practitioners, aware of these recommendations, claim that they counsel against smoking. But studies of medical records suggest that they do not do so comprehensively. In two studies, only 18% and 23%, respectively, of smokers were known to their physicians.^{13,14} Chu and Day¹⁵ suggest that physicians are more likely to recognize smokers when they are seen for health problems associated with smoking; physicians, predictably, "behave in a manner which is more disease oriented than preventive."¹⁵

Recently the Premier's Council on Health Strategy in Ontario produced a series of health goals for the province. One of the goals is to reduce tobacco consumption by 50% by the year 2000.¹⁶ If all family physicians systematically identified smokers in their practices and then provided them with an effective (structured) cessation program, we could make important steps toward meeting Ontario's goal.

This study evaluated alternative ways to improve the monitoring of smoking status

Figure 1. STUDY DESIGN



in practice records. The trial compared a case-finding approach (issuing reminders to physicians to ask patients about smoking habits at appointments) with a screening approach (asking patients by letter or telephone about their smoking habits). This formed one component of a larger trial that also evaluated the impact of reminders promoting four other screening procedures.

METHODS

All patients attending the University of Ottawa Family Medicine Centre at the Civic Hospital since 1976 have been registered on a computerized record system.¹⁷ Six medical practices are located at the Family Medicine Centre; each comprises a team of a staff physician, a nurse, and between three and five residents. The study ran for 1 year and involved all 8502 patients who were aged 15 years and older and not living in an institution.

Study design

The patients registered with four of the practices (16 physicians) were randomly al-

located to a control group or to one of three experimental groups, to be contacted by the physician, by the nurse's telephoning, or by letter (Figure 1). To reduce contamination among interventions, patients were allocated by family, so that all family members living at the same address were in the same group. To spread the work of contacting patients over a year, patients in the letter and telephone groups were divided into 24 equally sized "study week" groups. One study group was contacted every 2 weeks.

The remaining two practices (eight physicians) did not participate in the trial; these physicians did not change their usual approach to recording smoking status. The non-participating practices provide an additional, external control. We postulated that the control group of patients within the experimental practices might nevertheless be affected by the increased awareness of their physicians, who, being active in the experiment, might record smoking status more often. Comparison of the internal and external control groups should reveal any such contamination. No special inquiry was made of patients in either control group,

Table 1. NUMBER OF PATIENTS FOR WHOM SMOKING STATUS WAS RECORDED

TRIAL GROUP	NO. ALLOCATED	SMOKING NOT RECORDED AT BEGINNING OF STUDY	SMOKING RECORDED DURING STUDY ^a	CURRENT SMOKER ^a
Randomized control	1403	1294	154 (11.9%)	42 (27.3%)
Physician	1471	1363	517 (37.9%)	124 (24.0%)
Letter	1541	1437	706 (49.1%)	172 (24.4%)
Telephone	1468	1359	759 (55.8%)	217 (28.7%)
Control practices	2619	2417	229 (9.5%)	72 (31.4%)
TOTAL	8502	7870	2365 (30.1%)	627 (26.5%)

^aPercentages of the number in the previous column

but information gathered on smoking status (eg, during a routine consultation) was recorded on the computer in the usual way.

Letter group. Patients in the letter group were sent a letter during their study week inquiring, among other things, about their smoking status. They were given a prepaid return envelope and were asked to record their smoking status on a tear-off slip. A second letter was sent to those not responding within 21 days. The letter was printed and addressed by the computer; it was signed by the patient's physician and the practice nurse.

Telephone group. During every study week, four nurses called approximately 15 patients. The lists of people to be called, with telephone numbers, were produced by the computer. The nurses made up to five attempts to contact each family, during the day, to ask whether the patient smoked and, if so, how much. For a cost-effectiveness evaluation the nurses also recorded numbers of calls and the time required for all calls.

Physician group. When patients in the physician group attended for a scheduled appointment, the computer printed a message on the usual encounter form to remind the doctor to ask about smoking status. If the information was not recorded, further reminders were generated on subsequent visits. To assess the completeness of recording, we checked all such reminders to physicians for a 9-week period midway through the trial, interviewing the physicians after their consultations to compare their verbal

report with the data they recorded in the chart.

Data analyses

All information on smoking status was added to the computerized medical records. We compared the rates of recording smoking status in each intervention group. As the allocation was made by family and not by individual patient, the data were initially analyzed by randomly selecting one member from each family. These results were virtually identical to those obtained using all patients, and so for simplicity, the results presented here include all patients.

We evaluated the interventions in terms of the patients allocated to each group, rather than those known to have received the message. For the telephone and letter groups the results could have been inflated by the inclusion of patients who happened to visit the doctor before their study week and had their smoking status recorded during routine care. To correct this, we reanalyzed the data, considering only information recorded after the study week.

The cost-effectiveness analyses assessed the effectiveness of each intervention as the number of patients for whom smoking was recorded, beyond the number that would have been predicted from the rate in the randomized control group. Cost calculations considered the expense to the practice of contacting each patient. For the letter this included stationery, stamps, prepaid replies, and clerical time. For the telephone call it covered the clerical time to prepare and distribute the telephone lists to the

Table 2. SMOKING STATUS RECORDED BY DEMOGRAPHIC CHARACTERISTICS (N = 7870)

TRIAL GROUP	AGE GROUPS (%)				TOTAL (%)
	15-24 N = 1291: 741 F, 550 M	25-44 N = 3409: 1871 F, 1538 M	45-64 N = 1857: 994 F, 863 M	65+ N = 1313: 816 F, 497 M	
FEMALES					30.9
Randomized controls	14.2	10.2	18.8	8.1	
Physician	32.3	34.5	46.9	61.5	
Letter	38.4	39.3	60.0	68.4	
Telephone	52.0	50.7	65.0	64.5	
Control practices	7.3	8.1	11.8	11.7	
MALES					28.9
Randomized controls	5.7	9.5	15.4	15.7	
Physician	22.8	25.1	42.2	62.0	
Letter	40.4	36.4	65.8	64.9	
Telephone	55.6	50.4	63.4	56.8	
Control practices	6.4	6.8	10.8	17.4	
TOTAL	24.9	25.3	36.5	38.4	

nurses and the nurses' time in calling patients. Issuing reminders to the physicians required no additional clerical time, as the reminders were printed automatically on a summary sheet that is routinely produced for every consultation. The costing does not include computer costs, which were similar for all interventions.

RESULTS

As the random allocation was by family, the first analyses checked the equivalence of the study groups in terms of demographic characteristics. There were no significant differences among the four random groups in age, sex, or family size. There was no significant difference among the five study groups (including the control practices) on the sex of the patients (χ^2 3.31, 4 df). Therefore, it is unlikely that differences in outcomes were due to contrasts between the composition of the study groups.

At the start of the trial, smoking status had been recorded within the previous year for only 7% of patients. The results that follow examine the effect of the interventions for the remaining 7870 patients. Table 1 shows that 10% of patients in the control practices and

12% of the random control patients had their smoking status recorded during the year. Reminders to the physician increased the recording rate by 26% above the control level, the letter by 37%, and the telephone call by 44%. The differences among the three experimental interventions were statistically significant (χ^2 90.2, $P < 0.0001$), as were differences from the randomized control group (χ^2 97.7, $P < 0.0001$).

When data were reanalyzed, counting only results obtained after the study week for letter and telephone patients, the recording rates were 47.1% for the letter group and 54.8% for the telephone group, only marginally lower than those shown in Table 1. The telephone approach failed to produce a record, in cases when the nurse was unable to reach the patient, the patient did not return phone calls, or the patient spoke neither French nor English. No patients contacted refused to answer the question.

Not all patients visited the practice during the year; those in the physician group who did not visit would not have had their smoking recorded. Smoking status was recorded for 75.7% of patients who did visit the practice. The equivalent figure for the random controls was 22.9%.

Completeness of recording

Table 2 shows the completeness of recording by age and sex of the patient, indicating a steady increase in recording in the experimental groups from age 45 onward. Results for the control groups, by contrast, showed little association with age, especially for women. Among the older age groups, the physician was as effective as the letter and nurse approaches, presumably because older patients visit more often. Young women tend to visit their physicians more frequently than young men, and the physician approach was, indeed, more successful for young women than for young men, whereas there was little difference between the sexes for the other intervention methods.

Cost effectiveness

The total cost for the letters, including replies, was \$2299. The letter yielded a 37.2% improvement over the control group, and thus cost \$61.80 for each percentage point increase over the control group result.

For the telephone intervention, clerical and data entry time (at \$10.00 per hour) cost a total of \$150.97; the nurses took a total of 54.56 hours to call 1188 families. At a salary of \$15 per hour, this cost \$818.40, giving a total for the nurse group of \$969.37. The telephone approach yielded a 44% improvement over the control group, thus costing \$22.03 for each percentage point of improvement over the control group result.

The physician required an estimated 15 seconds to record the patient's smoking status, a total of 191.5 minutes for the 766 patients who visited the practice. At a salary of \$60 per hour, this cost \$191.50. The physician achieved a 26% improvement over the control group. The cost per percentage point of improvement was, therefore, \$7.37.

DISCUSSION

It seems unlikely that a brief consultation with a physician will significantly alter an addictive habit that sometimes has endured for many years. It then becomes all the more important to offer long-term encouragement and support to patients who are trying to quit smoking. To achieve this, the doctor must, obviously, be aware of patients who are smoking and of those who have recently stopped. The administrative demand of

such record keeping can be eased by an automated system that prints a summary of relevant health information, such as previous smoking status, each time the patient visits. This trial addressed the practical issue of how to ensure that medical records contain information on smoking; we fully recognized that this is a necessary, but far from sufficient, condition for establishing routine antismoking counseling.

The letter and telephone interventions were both active screening approaches. The difference was that the telephone intervention involved personal contact with a health professional and offered the opportunity for discussion and counseling. This method proved more effective than the letter. The telephone approach might also be made more effective by making phone calls in the evening, if this is feasible for the practice.

The physician intervention was opportunistic. As expected, the physician's case-finding approach was less effective at a population level, because only 53% of patients visited their family physician during the study year. However, among patients who did visit, physician contact gave the highest yield of the three groups (75.5%). Because approximately 90% of patients are likely to visit the physician within 3 years, this method could be considered the most effective in the long term.

Comparing the costs is more complex. The opportunistic approach costs very little. It requires little extra time to raise the issue of smoking during a consultation, making the marginal cost very low. Simply reminding the physician to inquire about the smoking status of every patient, therefore, appears to be a cost-effective first-line approach. As *Table 2* suggests, however, this approach will not reach patients, such as many young men, who seldom visit the practice. Reaching them will require additional, active interventions.

Of the methods we compared, sending letters proved almost three times as expensive as telephoning to achieve a similar result. Accordingly, we suggest using telephone calls as a second-line approach to patients who do not visit the practice regularly. The relatively high cost of telephoning will, of course, be more acceptable if several preventive topics (blood pressure, immunization, etc) are discussed in the same call.

The results could have underestimated the effectiveness of our interventions. In telephoning and sending letters, we discovered that our practice denominator was inflated, a well recognized problem in family practice research.¹⁸ The nurses found that 15% of the people they tried to contact had left the practice. Because these people belonged to all study groups, the problem did not affect our comparison among the interventions, but it did reduce the estimates of their overall effectiveness.

By no means, though, had all of the patients who did not visit during the study year left the practice. Replies to the telephone calls and letters were obtained from 48% of those who did not visit the practice during the study years, illustrating the advantage of a screening approach.

Our data reflect the general downward trend in smoking. A 1980 survey of 2000 consecutive patient visits to the practice determined that 36% of patients in the practice smoked.⁷ A survey in 1982 estimated that 33% of patients smoked,⁸ while this study in 1985 found the rate had fallen to 29%. Further studies would be required to determine whether repeated assessment of smoking status and the possible addition of a counseling component have a cumulative effect on smoking cessation.

CONCLUSION

At a minimum, family physicians should routinely record the smoking status of all their patients. We recommend a two-stage strategy, with reminders to the physician being supplemented by telephone calls to patients who do not visit within a chosen period. Telephoning patients who do not attend also allows practice denominators to be updated regularly. Widespread adoption of this policy, combined with offering validated smoking cessation programs, could contribute substantially to the health goal of reducing tobacco consumption by 50% by the year 2000. ■

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References

- Wechsler H, Levine S, Idelson RK, Rohman M, Taylor JO. The physician's role in health promotion: a survey of primary care practitioners. *N Engl J Med* 1983;308:97-100.
- Baumgartner K. Smoking cessation: physician - make a stand [editorial]. *Can Med Assoc J* 1982;126:101-2.
- Conger B, Nelson EC, Dietrich AJ, Blanchard C, McHugo GJ, Simmons JJ, et al. Effectiveness of physician antismoking advice. *Am J Prev Med* 1987;3:223-6.
- Russell MAH, Wilson C, Taylor C, Baker CD. Effect of general practitioners' advice against smoking. *Br Med J* 1979;2:231-5.
- Richmond RL, Austin A, Webster IW. Three-year evaluation of a programme by general practitioners to help patients to stop smoking. *Br Med J* 1986; 292:803-6.
- Rose G, Hamilton PJS. A randomized controlled trial of the effect on middle-aged men of advice to stop smoking. *J Epidemiol Community Health* 1978; 32:275-81.
- Stewart PJ, Rosser WW. The impact of routine advice on smoking cessation from family physicians. *Can Med Assoc J* 1982;126:1051-4.
- McDowell I, Mothersill K, Rosser W, Hartman R. A randomized trial of three approaches to smoking cessation. *Can Fam Physician* 1985;31:845-51.
- Pederson LL. Compliance with physician advice to quit smoking: a review of the literature. *Prev Med* 1982;11:71-84.
- Wilson DM, Taylor WE, Gilbert JD, Lindsey EA, Wilms DG. A randomized trial of a family physician intervention for smoking cessation. *JAMA* 1987; 260:175-9.
- Gilbert JD, Wilson DM, Best AJ, Taylor W, Lindsay EA, Singer J, et al. Smoking cessation in primary care: a randomized controlled trial of nicotine bearing chewing gum. *J Fam Pract* 1989; 28:49-55.
- Canadian Task Force on the Periodic Health Examination. The periodic health examination: 1985 update. *Can Med Assoc J* 1986;134:724-7.
- Battista RN, Palmer CS, Marchand BM, Spitzer WO. Patterns of preventive practice in New Brunswick. *Can Med Assoc J* 1985;132:1013-5.
- Fleming DM, Lawrence MST. An evaluation of recorded information about preventive measures in 38 practices. *J R Coll Gen Pract* 1981;31:615-20.
- Chu FZ, Day RG. Smoking recognition by family physicians. *J Fam Pract* 1981;12:657-60.
- Premier's Council on Health Strategy. *Towards health outcomes: goal 4 - objectives and targets*. Toronto, Ont: Ontario Ministry of Health, 1991:13.
- Rosser WW, Fluker G. Software for family practice: a decade of development. *Can Fam Physician* 1984;30:2567-71.
- Cherkin DC, Berg AO, Phillips WR. In search of a solution to the primary care denominator problem. *J Fam Pract* 1982;14:301-9.