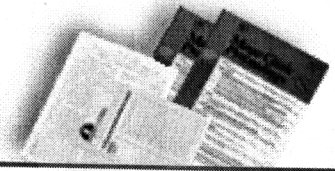


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Smoking Status as the New Vital Sign: Effect on Assessment and Intervention in Patients Who Smoke

[Articles]

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Abstract

Objective: To assess the effect of expanding the vital signs to include smoking status.

Design: We prospectively conducted exit interviews with patients at a general internal
medicine clinic in Madison, Wisconsin, during a 16-month period from 1991 to 1993.

Methods: Patients were surveyed briefly before (N equals 870) and after (N equals
994) the implementation of a simple institutional change in clinical practice. This change
involved training the staff in how to use progress notepaper with a vital sign stamp that
included smoking status (current, former, or never) along with the traditional vital signs.
Included in the survey were questions about whether the patient smoked, whether the
patient was asked that day about smoking status (by a clinician or other staff), and, for
smokers, whether they were urged to quit smoking and given specific advice on how to
do so.

Results: After expansion of the vital signs, patients were much more likely to report
inquiries about their smoking status on the day of a clinic visit (an increase from
approximately 58% at baseline to 81% at intervention; P less than 0.0001). The vital sign

intervention was associated with significant increases in the percentage of smokers who reported that their clinician advised them that day to quit smoking (from approximately 49% at baseline to 70% during the intervention; P less than 0.01) and in the percentage who reported that their clinician gave them specific advice that day on how to stop smoking (from approximately 24% at baseline to 43% during the intervention; P less than 0.01).

Conclusion: Expanding the vital signs to include smoking status was associated with a dramatic increase in the rate of identifying patients who smoke and of intervening to encourage and assist with smoking cessation. This simple, low-cost intervention may effectively prompt clinicians to inquire about use of tobacco and offer recommendations to smokers.

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GIMC equals General Internal Medicine Clinic; MA equals medical assistant

Despite decades of coaxing, American clinicians have not adequately addressed the chief avoidable cause of illness and death in our society: cigarette smoking. Recently, the Centers for Disease Control and Prevention reported that fewer than 60% of smokers in the United States have ever been advised by their physician to quit smoking. [1] In a much smaller percentage of smokers, clinicians have provided specific assistance on how to quit smoking successfully.

These findings are especially discouraging because of the opportunities physicians have to offer advice to patients who smoke. More than 70% of smokers are examined by a physician every year, [1] 65% of smokers say that they want to quit smoking and have made at least one attempt to do so, [2] and smokers cite a physician's advice to quit smoking as an important motivator for attempting to stop. [3] Moreover, even a brief recommendation from a clinician has been shown to increase smoking-cessation rates significantly. [4] Addressing this issue, the American Medical Association Council on Scientific Affairs [5] has recommended that physicians should ``assess routinely the smoking habits of their patients and encourage them to quit smoking by offering direct educational assistance or referring them to community smoking cessation clinics."

Educational strategies such as lectures, conferences, and guidelines have minimally influenced physicians to inquire about smoking. Recent data suggest that institutional or system changes may be necessary to alter physician practices. [6-11] In 1991, Fiore [12] proposed a simple institutional change to promote the identification and documentation of

patients who smoke--expansion of the vital signs to include smoking status. Such an intervention has many virtues. (1) The recording of vital signs is an accepted and almost universal medical practice; therefore, including smoking status in the vital signs would not entail unique efforts (for example, chart marking or coding). (2) Vital signs can routinely be documented by a medical assistant (MA) or nurse; thus, compliance with the procedure should be facilitated, and physician time need not be expended. (3) Expanding the vital signs is essentially cost-free because it piggybacks onto a current procedure that is almost universal. (4) The procedure is easily "exportable" and could be used in virtually every clinic. (5) It is remarkably simple. (6) Because of the widespread assessment of the vital signs, it would promote the identification of most smokers encountered in a clinic or emergency department setting. (7) It charges the institution with the responsibility of identifying patients who smoke and thereby enables clinicians to focus on intervention rather than assessment. (8) It can readily be used in conjunction with other office-based smoking-cessation efforts such as the National Cancer Institute program, "How to Help Your Patients Stop Smoking." [13]

Thus far, no published research has assessed the effectiveness of expanding the vital signs to include smoking status. In this article, we report our initial findings about the effect of this simple institutional change on the identification of patients who smoke and on the interventional efforts to assist with smoking cessation.

METHODS

The research site was the General Internal Medicine Clinic (GIMC) at the University of Wisconsin Hospitals and Clinics. Baseline and intervention (the expansion of the vital signs to include smoking status) data were collected during a 16-month period from 1991 to 1993 by using anonymous inperson surveys of patients as they exited the clinic. During this period, the GIMC was staffed by 47 physicians and 5 nurse-practitioners. Approximately 28,000 patients made 50,000 visits per year to this clinic during this time.

Baseline Survey.

Before the vital sign intervention was implemented, approximately 870 patients were surveyed between September 1991 and January 1992 to determine baseline rates of smoking status assessment and intervention. Physicians were told that the interviewers were conducting a brief patient survey of clinic experience, but they were not informed that the survey specifically addressed the assessment of patients' smoking status. Patient self-report was the exclusive source of data for this survey.

A research assistant sat at the sole exit of the clinic and administered a brief anonymous survey of up to seven simple questions. Specifically, patients were asked their age and the name of the clinician they visited that day. Patients were then asked whether the clinician had asked them that day about their smoking status, whether another staff person in the clinic had asked that day about smoking, and if anyone in the clinic had asked about their smoking status. Lastly, all patients were asked whether they smoked. Nonsmokers were thanked and not questioned further.

Patients who identified themselves as smokers were then asked whether the clinician had (1) advised them that day to stop smoking and (2) provided specific advice or suggestions that day on how to stop smoking. On the average, the inperson survey was completed in 40 seconds. The research assistant attempted to survey every patient who exited the clinic. Fewer than 5% of patients refused to participate. The number of surveys collected was approximately equal across the 5 weekdays that the clinic was open and approximately equal between morning and afternoon visits to the clinic.

Expansion of Vital Signs.

After the baseline assessment of usual care, a simple institutional intervention was initiated--making smoking status part of the vital sign assessment completed by MAs before the consultation with a clinician. At the time of registration at the GIMC, each patient has a new piece of progress notepaper inserted in the front of the personal medical record. This piece of progress notepaper is used by the clinician as the permanent medical record of the current encounter. Before the intervention, MAs manually recorded the traditional vital signs (blood pressure, pulse, respiratory rate, and temperature) at the top of the progress notepaper. Beginning in September 1992, all progress notepaper was preprinted with a vital sign stamp Figure 1. Thereafter, when the traditional vital signs were determined by the MA, the preprinted vital sign stamp was used to prompt the MA to inquire about and document whether the patient was a current, former, or "never" smoker.

Blood pressure: _____			
Pulse: _____		Weight: _____	
Temperature: _____			
Respiratory rate: _____			
Smoking:	Current	Former	Never
	(circle one)		

Figure 1. Vital signs stamp. (From Fiore. [12] By permission.)

The MAs were given a 30-minute in-service training in September 1992. They were told that the purpose of expanding the vital signs was to improve our effectiveness in smoking-cessation assistance. They received instructions in how to ask about smoking status and were told that the question must be asked of every patient on every visit regardless of what medical problem prompted the visit. Moreover, they were instructed to inquire about the smoking status of every patient, even if the patient had recently been to the GIMC. Finally, the MAs were told that the smoking status question was a required part of assessment for each patient; it was not optional. Intervention surveys were collected from September 1992 until January 1993.

RESULTS

The baseline survey was completed by 870 patients, including 80 current smokers (9.2%); 994 patients, including 165 smokers (16.6%), completed surveys during the intervention phase Table 1. At baseline, about 60% of the sample was female and the mean age was 45 years (SD equals 17.7). During the intervention phase, approximately 54% of patients surveyed were female and the mean age was 48 years (SD equals 17.9). At the time of these surveys, the overall prevalence rate for smoking in Madison, Wisconsin, was 16%. [14] This low percentage of smoking reflects the high average educational attainment of residents of Madison, a university city of approximately 200,000 residents. We are unable to account for the especially low smoking prevalence

rate among patients surveyed during the baseline phase.

Factor	Survey	
	Baseline	After intervention
Participants (no.)	870	994
Female (%)	60	54
Age (yr)		
Mean	45	48
SD	17.7	17.9
Smokers (%)	9.2	16.6

Table 1. Characteristics of Patients Surveyed at Baseline and After Expansion of Vital Signs to Include Smoking Status

The vital sign intervention increased dramatically the rates of identification of smokers. Of all patients surveyed (smokers plus nonsmokers), 25.5% at baseline versus 52.6% during the intervention phase reported that they had been asked that day by their clinician whether they smoked Table 2. This doubling in the rate of clinicians asking about smoking was statistically significant.

Asked that day about smoking status	Patients (%)		P	χ^2
	Baseline (N = 870)	After vital sign intervention (N = 994)		
By clinician	25.5	52.6	<0.0001	141.9
By nonclinician	45.5	65.7	<0.0001	76.8
By clinician or nonclinician	57.5	80.8	<0.0001	120.4

Table 2. Expansion of Vital Signs to Include Smoking Status: Effect on Rates of Identification of Patients Who Smoke

Of all patients surveyed, 45.5% at baseline versus 65.7% during the intervention phase reported that they had been asked that day by a staff person other than their clinician whether they smoked. Finally, 57.5% at baseline versus 80.8% during the intervention phase reported that they had been asked that day by anyone in the clinic (clinician or other staff person) whether they smoked. These increases in percentages after expansion of the vital signs were statistically significant Table 2.

Implementing the vital sign intervention also increased the rates of advising and intervening in patients who smoked. Among smokers surveyed, 48.8% at baseline versus 69.8% during the intervention phase reported that their clinician advised them that day to quit smoking. Finally, after the intervention, smokers were much more likely to report that their clinician provided specific advice or suggestions that day on how to stop smoking (from 23.8% at baseline to 42.6% during the intervention) Table 3.

Advised that day by clinician	Smokers (%)		<i>P</i>	χ^2
	Baseline (N = 80)	After vital sign intervention (N = 165)		
General recommendation to stop smoking	48.8	69.8	<0.01	8.9
Specific advice or suggestions to stop smoking	23.8	42.6	<0.01	7.4

Table 3. Expansion of Vital Signs to Include Smoking Status: Effect on Rates of Intervention in Patients Who Smoke

DISCUSSION

The survey data reported herein suggest that expanding the vital signs to include smoking status is an extremely potent intervention. This simple change in the operation of a general internal medicine clinic along with brief staff training was associated with a

substantial increase in both the rate of assessment of smoking status and the rate of intervention in patients identified as smokers. If these findings are systematically replicated, this easy, low-cost, institutional change will provide a simple means of ensuring that most patients who smoke are identified and can be offered intervention when encountered in a health-care setting.

These findings build on other recent studies in which institutional or system changes were considered necessary to alter clinician behavior fundamentally. Dietrich and colleagues [8] compared the influence of physician education versus office system intervention on the delivery of cancerprevention interventions, including advice to quit smoking. Their system interventions consisted of preventive-care flow sheets for each patient's medical record (including smoking status) and an external identifier for smokers' records. Those investigators found that the institutionalized intervention, but not the educational intervention, resulted in more recommendations to quit smoking. Strecher and associates [9] reported that inclusion of smoking status prompts in the medical records yielded a higher rate of smokers reporting that their physician had advised them to quit smoking (71%) in comparison with a control condition in which such prompts were not implemented (58%). McPhee and coworkers [10] assessed the effect of using computer-generated lists of required cancer-prevention activities, including smoking assessment and counseling, among a population of community-based primary-care clinicians. This institutional change significantly increased the rates of both smoking assessment and counseling. Finally, Cohen and colleagues [11] found that simple labeling of medical records of smokers before a physician visit was associated with a considerable increase in the rates of biochemically confirmed long-term smoking cessation. They concluded that "changing the way clinicians practice requires altering their routine practice environment." [11] These findings support the conclusions of Kottke and associates [15] and Lawrence [16] that the implementation of systemic or organizational changes within a practice setting enables and facilitates the counseling behavior expected of the clinician.

In the current study, certain limitations warrant mention. Because the study consisted of a single clinic site, it does not provide information on the generalizability of the observed effects. Inclusion of smoking status in vital sign assessment should be evaluated in a larger sample of heterogeneous clinics to rule out the possibility that the University of Wisconsin GIMC was unique in its receptiveness to this intervention. In addition, our study yielded no information about the effect of various providers on outcomes. Perhaps in a future study, providers might constitute the unit of analysis, and results could be analyzed with respect to this factor. Another limitation was that no control group was

assessed concomitantly with the vital signs intervention at the GIMC. Without a control group, the observed effect could possibly have been a time-dependent phenomenon linked to secular trends or events. Such trends or events may have included increased physician knowledge about the health risks of cigarette smoking or the introduction of a new pharmacologic smoking treatment (the nicotine patch) in 1991 and 1992. Additionally, the sample size in this study was relatively small; thus, the effect of the intervention on individual physicians could not be analyzed. This issue should be addressed in future research, which might include gathering data on physician readiness to counsel patients who smoke as a predictor of clinician intervention. [17] Moreover, the fidelity of the intervention over time was not systematically monitored. Although initial spot checks were completed to ensure that the intervention was implemented, an important aspect would be to assess whether expanding the vital signs to include smoking status results in long-term changes in clinical practice without the need for time-consuming monitoring and feedback. Finally, the current study was conducted in a clinic that included resident physicians in training. Replication in a more representative primary-care setting is necessary.

If replication studies confirm the "exportability" of the vital signs intervention to other clinic settings, the next logical research investigation should address the following question: Does increased identification of, and intervention in, patients who smoke result in greater numbers of attempts to quit smoking and more successful smoking cessation? Because the current study used an anonymous survey, follow-up of individual patients was precluded, and this important concern could not be addressed. Of importance, however, this simple, low-cost, institutional intervention was sufficient to more than double the rate of smoker identification and was associated with a significantly increased rate of clinical intervention. With increasing demands on limited clinician time, this institutional change offers a vast potential to improve existing rates of intervention to assist in smoking-cessation efforts.

CONCLUSION

In this initial study, expansion of the vital signs to include smoking status was associated with significantly increased rates of identification of patients who smoke and intervention to inquire about and discourage cigarette smoking. If these findings prove generalizable, inclusion of smoking status as a vital sign will provide a simple, effective, and low-cost method of intervening clinically with the chief avoidable cause of illness and death in our society--use of tobacco. [18]

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