

Improving Physician Compliance With a Health Maintenance Protocol

Paul S. Frame, MD, Barbara A. Kowulich, PA, and Ann M. Llewellyn, RN
Cohocton, New York

A two-year prospective study was conducted to determine whether specific educational, organizational, and behavior reinforcing interventions could improve physician performance of selected health maintenance procedures in the private practice setting. The procedures studied included history of tobacco use, blood pressure determination, history of alcohol use, fecal occult blood testing for colon cancer, Pap smears, and physician breast examinations. Overall compliance with these procedures improved from 58 percent to 72 percent.

There were marked differences in compliance among the procedures, ranging from 99 percent of patients having their blood pressure recorded to 51 percent having a fecal occult blood screening for colon cancer.

Compliance with use of a screening flow sheet was much less than compliance with specific procedures. The screening flow sheet was completed on only 29 percent of patients' charts.

Selective longitudinal health maintenance has become increasingly accepted by organized medicine since it was introduced in the mid-1970s. Numerous authors and groups, including The American Cancer Society,¹ American College of Physicians,² and The American Medical Association,³ now endorse this concept, although they may disagree on specific screening recommendations.

Any health-maintenance protocol is worthless, however, unless it is actually used on a day-to-day basis by practicing physicians. Mandel et al⁴ have shown that physician compliance with a health maintenance protocol in a family practice resi-

dency program was poor, with only 37.4 percent of physician-dependent screening procedures completed. Cohen and co-workers⁵ reported improvement with rates of immunization for pneumonia and influenza as well as referrals for mammography from 2 percent to 40 percent after a short (four-month) period of educational interventions in a university internal medicine clinic. No study has reported physician compliance with a health maintenance protocol in private practice. In 1979 Frame⁶ described implementation of a health maintenance protocol in a rural private practice. Other physicians in that group (Tri-County Family Medicine) were aware of the protocol and had access to it. It was not known to what extent they used the protocol or offered selective longitudinal health maintenance to their patients.

The purpose of this study was to demonstrate that physician compliance with a protocol of selective health screening could be improved by a motivation-building program including educational

From the Tri-County Family Medicine Program and The Department of Preventive, Family and Community Medicine, University of Rochester, School of Medicine, Rochester, New York. Requests for reprints should be addressed to Dr. Paul S. Frame, Tri-County Family Medicine, Cohocton, NY 14826.

sessions, organizational changes, and behavior-reinforcement techniques.

Methods

Tri-County Family Medicine is a nonprofit corporation that provides primary care to patients in a rural area surrounding the Village of Dansville (population 6,000) in western New York State. The group maintains five offices: a central office in Dansville staffed by two family physicians, an office in the Village of Nunda (population 1,000) staffed by one family physician and a physician's assistant, offices in Canaseraga (population 700) and Wayland (population 2,500), each staffed by a family physician, and a fifth office in Cohocton (population 1,000), staffed by two of the authors (PSF and BAK) and not included in the analysis of data for this study. Thus, although the six physicians are members of the same group, they practice in different offices and are largely independent in their style of practice. For purposes of the study the physician and physician's assistant in Nunda were considered a single team, since the physician reviewed the charts and was responsible for the work of the physician's assistant. Four of the physicians are residency trained and are diplomates of the American Board of Family Practice. One physician is not board certified or residency trained.

An initial audit of the charts of 100 of each physician's patients was done in December 1980 to establish a baseline of screening performance. Charts were chosen randomly from patients aged over 21 years (born in 1958 or before) by selecting every tenth patient from the age-sex registry. To be included in the audit, the patient must have been seen at least twice in the preceding two years. Furthermore, in the Dansville office patients were not included unless the identified physician had seen them on two thirds or more of their office visits.

Table 1 shows the specific parameters that were audited. It was decided to confine the study to the six screening procedures in the protocol that were felt to be most important and whose value was best substantiated in the literature. In addition, two chart-recording items were audited. The first, use of the screening flow sheet, was emphasized in

subsequent interventions, while the second, use of the problem list, was not mentioned and therefore served as a control that the results of the study were not due to better record keeping in response to nonspecific interventions.

Since physician compliance, not patient compliance, was being studied, physicians were given credit for a test not actually performed if it was noted that the test was done elsewhere, that it was offered and the patient refused, or that the test was contraindicated because of other medical conditions.

A two-year study period was established during which interventions to improve compliance with the screening protocol were completed. A follow-up audit identical to the initial audit was done at the end of two years in January 1983 to evaluate what change in physician health maintenance behavior had occurred. Interventions to modify behavior included educational sessions, organizational meetings within each office, and spot audits to reinforce compliance.

The educational sessions were physician and staff oriented. Two sessions were directed at the physicians. One was a presentation of the results of the first audit and a discussion of the reasons for noncompliance with screening. The outline of the proposed program for improving compliance was presented to the physicians in order to obtain their support, feedback, and comments. An outside consultant from the University of Rochester Department of Family Medicine was present at this session.

The second physician-oriented session was a journal club discussion of the rationale for particular screening tests about which the physicians had doubts (eg, fecal occult blood testing). An educational session was also held for the staff of all the offices. The concept of selective longitudinal screening was presented, and the role of staff members in implementing screening was discussed.

A meeting was held at each individual office by two of the authors (PSF and AML) for physicians and staff to reduce organizational barriers to screening. The concerns varied in each office, but included finding time to do screening, determining who would do which procedures, making flow sheets and patient handouts available, and developing specific procedures for doing specific tests (eg, distributing and developing fecal occult blood cards).

Table 1. Definitions of Audited Health-Screening Parameters

1. Blood pressure: recorded on the office chart during the past two years
2. Pap smear: done on women within the past two years
3. Smoking history: recorded anytime on the patient's chart
4. History of alcohol use: recorded anytime on the patient's chart
5. Physician breast examination: done on women within the past two years
6. A six-card fecal occult blood test: done within the past two years on all patients aged 50 years or older
7. Use of the screening flow sheet: defined as two thirds or greater of the above items, if indicated, recorded on the flow sheet in a proper manner
8. Use of the problem list: defined as containing one or more problems coded with the appropriate ICHPPC code. To be completed on all patients with chronic medical problems

Six spot audits were done during the study period. One of the authors (AML) would notify the office staff to save all charts of patients seen by a given physician that day. She would audit the charts using the same methods used in the initial audit, and the results would be discussed at subsequent staff meetings. The first of these audits was announced in advance; the rest were unannounced.

Results

There was a clinically and statistically significant improvement in performance of health maintenance procedures for the entire group during the study period. On the initial audit 58 percent of indicated procedures were done. This improved to 72 percent of indicated procedures done on the final audit ($\chi^2 = 93.6$, $P < .005$). Four of the

five individual physicians' performance improved. One physician's performance stayed the same; however, he had the highest compliance on the initial audit and the second highest compliance on the final audit.

There was a significantly better performance by the four residency-trained physicians on both the initial and final audits than the one non-residency-trained physician.

The wide range of compliance with specific screening recommendations among the physicians is presented in Table 2. For example, a history of alcohol use was obtained from only 18 percent of one physician's patients but was obtained from 81 percent of another physician's patients. Performance of stool occult blood testing for colon cancer was also highly variable, ranging from 13 percent to 71 percent among individual physicians' patients. In contrast, blood pressure determinations (done by nurses) were obtained on all patients in four of the five centers at the final audit.

Use of the screening flow sheet was less frequent than compliance with individual screening procedures (Table 2), but it did improve during the study period ($\chi^2 = 77$, $P < .005$). Use of the problem list, which was not mentioned in any of the interventions, did not show significant improvement ($\chi^2 = 2.06$).

Discussion

The goal of this project, to demonstrate that physician compliance with a health maintenance protocol could be improved, was accomplished. The 72 percent overall compliance on the final audit is quite respectable and is significantly better than the 40 percent compliance for immunizations and mammograms reported by Cohen et al in a shorter (four-month) study.⁵ Whether the improved performance of health maintenance procedures will continue after the end of the two-year study remains unknown and will depend largely on the internal motivation of the individual physicians.

The study did not determine which of the interventions, educational sessions, office organizational meetings, or periodic spot audits had the greatest effect on increasing compliance. The in-

Table 2. Percentage of Specific Screening Items Completed by Each Physician in December 1980 and December 1982

	Physician 1		Physician 2		Physician 3		Physician 4		Physician 5		Group Average	
	1980	1982	1980	1982	1980	1982	1980	1982	1980	1982	1980	1982
Smoking history	36	51	59	89	46	78	85	79	85	72	62.2	73.8
Blood pressure	89	100	91	100	87	94	100	100	100	100	93.4	98.8
Alcohol history	2	18	29	81	9	42	61	62	18	56	23.8	51.8
Stool occult blood	0	13	42	48	51	62	48	71	53	62	38.8	51.2
Pap smear	51	60	62	89	60	73	70	62	59	69	60.4	70.6
Breast examination	50	62	60	91	68	61	68	65	66	72	62.4	70.2
Use of flow sheet	0	10	27	73	6	7	8	26	0	29	8.2	29.0
Problem list	3	9	34	42	36	30	76	76	34	56	36.6	42.6

tent was to show that a maximal effort could change behavior. Initially a financial incentive for improved compliance was considered. This proposal met with considerable resistance from several physicians who felt such an incentive would be degrading and prove nothing more than that they could (or could not) be bribed.

A short questionnaire was given to the physicians after the end of the study but before the results were known. Their responses indicated that no single intervention was felt generally to have the most impact. In fact, two physicians said all the interventions had "little or no impact." Ironically, these two physicians improved the most. Perhaps awakening their own latent motivation was more important than any specific intervention.

There was some correlation between how strongly physicians believed in the value of a given procedure and how frequently it was performed. Specific doubts were expressed about the value of fecal occult blood testing and obtaining a history of alcohol use.

Surprisingly, a screening flow sheet does not seem to be essential to obtaining compliance with health maintenance procedures. Although use of the flow sheet increased, four of the five physicians used it relatively infrequently compared with their performance of specific screening procedures.

Lack of time was mentioned by several physicians as the greatest barrier to improved compliance with screening procedures.

These findings suggest that with motivated

physicians who believe in the value of the recommended screening procedures, compliance with health maintenance procedures can be improved. The specific interventions employed may be less important than the fact that some intervention has occurred.

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