Cancer Prevention Services and Physician Consensus in Primary Care Group Practices

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Abstract

Background: We conducted a randomized clinical trial of interventions to achieve physician consensus, practice changes, and patient activation designed to help primary care group practices enhance the delivery of cancer prevention and screening services. Methods: In each of 42 primary care practices in 1991 to 1994, we studied approximately 60 patients per physician who were between the ages 53 and 64. Data sources included patient and physician questionnaires, medical record audits of consenting patients for evidence of 11 cancer prevention services during the previous 3 years, and telephone interviews with key practice personnel. Results: None of the interventions was associated with significant changes in frequency of services or procedures received or provided. Increased frequencies of services overall and of specific activities were associated with HMO membership or insurance coverage for six screening procedures. Patient reports of clinic staff recommendations to have each of six screening procedures were specifically associated with higher frequencies of services (P = 0.001). Conclusions: Demonstration of intervention impact may have been limited because the rates of prevention services were significantly higher in this study than have been reported elsewhere. These results might be explained by selection biases inherent in studying patients with a regular provider, overall practice trends for changes in provision of the studied services, and the study methods. (Cancer Epidemiol Biomarkers Prev 2004; 13(6):958–66)

Introduction

There is a large deficit in cancer prevention counseling and screening services ('cancer prevention services') provided to adults in academic and nonacademic primary care medical practices (1, 2). This deficit is thought to be associated with excesses in incidence, morbidity, and mortality from cancer because counseling and screening services have been shown in clinical trials to reduce these rates (3, 4). Intervention studies designed to increase provision of prevention services have had mixed results. Many trials have been conducted with select patient populations or in academic practices (5-8), a selectivity that questions their relevance for nonacademic medical practices (1). Studies of predictors or correlates of obtaining various cancer prevention services, especially mammography, have pointed to the apparent central role of provider staff or physician recommendations in the ultimate delivery and receipt of these services (9, 10). Patient ''activation'' strategies and computer reminders, and other technical strategies have been associated with limited success depending on practice circumstances (8, 11-15).

To study the frequency of prevention services and methods for changing them, we focused on the most common organizational setting for the delivery of prevention services in the United States—nonacademic primary care group practices. Data suggest that such settings may be functional communities, the collective attitudes and behaviors of which evolve into local consensus and norms of practice (16). We hypothesized five requisites for provision of optimal cancer prevention services by such practice groups:

1. Awareness of their current levels of performance (17)
2. Group consensus about standards or goals for specific prevention services (16)
3. Active involvement of physicians in critical decisions about and plans for behavior changes (enabling mechanisms) to address consensus standards (18-21)
4. Implementation of the enabling mechanisms, such as practice strategies or specific procedures to facilitate an activity (22)
5. Attention to patients to ensure their awareness of the practices as cancer prevention services providers and to acknowledge their role in initiating and seeking cancer prevention and screening services (23)

On the basis of these hypothesized requisites, we proposed a consensus model for the delivery of prevention services in primary care (Fig. 1) and designed an intervention study of groups of primary care providers and their patients with interventions based on these requisites. Our goal was to evaluate whether attention to

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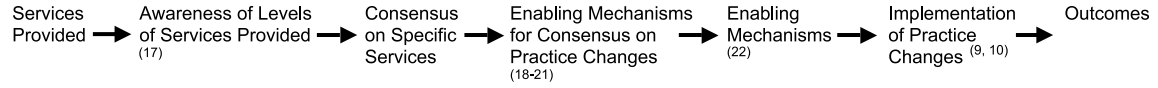

Figure 1. A consensus model for preventive services delivery in primary care and variables used to measure each construct.

all or some of these requirements affected performance rates for cancer prevention and screening services. We studied adults 53 to 64 years of age because of greater consensus on cancer prevention services for this age group (3).

Methods

Group Practice, Physician, and Patient Samples. Under a protocol approved by the University of Wisconsin Committee for the Protection of Human Subjects (UWCPHS 90-370-368; approval date November 1, 1990) and by local institutional review boards where appropriate, we solicited participation from regional (Wisconsin, Minnesota, Michigan, Illinois, Iowa) group practices with 3 to 10 primary care (family medicine, general practice, or internal medicine) physicians. Confidentiality of data was assured, and physicians were not told which of their patients agreed to participate. An eligible practice had to have most physicians (no fewer than three) who consented to participate. Forty-six practices were successfully recruited. Three were used to pilot instruments and methods. One withdrew before any data were collected. The final convenience study sample was 42. Following stratified random selection procedures, we identified potential patient subjects of physician participants—60 per practitioner, 40 women, 20 men—by brief review of all charts (in 19% of practices), computer records of practice patients (in 26% of practices), or by a combination of these (50% of practices). In 5% of practices, the absence of computer records and the chart organization system led to an agreement that practice staff would follow the same procedure and identify subjects from the charts. An eligible patient had to be (1) identified as 'with' a consenting physician by chart notation for a visit in the previous 3 years; (2) between 52 and 64 years of age on the date of identification; and (3) had to have had at least two visits to the consenting physician during the previous 5 years with at least one of these visits being in the previous 2 years. Such criteria were felt to identify patients whom physicians would consider to be regular patients to the practice (24). We projected that 20 male and 40 female cases per physician would provide stable estimates of physician prevention and screening practices, and these projections were confirmed in the sequential hierarchical outcomes (25).

Patient Questionnaires. Eligible patients were mailed a preliminary questionnaire and letter which asked for (1) eligibility (birth date, provider, and health status—subjects had to be without a diagnosis of cancer except for non-melanomatous cancers of the skin) and demographic information; (2) recall of 11 preventive services received at least once in the previous 3 years [specifically, periodic health visit, diet counseling, smoking status, smoking counseling, breast self-examination (BSE) instruction, clinical breast exam, mammography, rectal exam, Pap test, ''Hemoccult,'' and sigmoidoscopy or colonoscopy]; and (3) consent to review of their medical records. Eligible patients who returned this preliminary questionnaire and who consented to questionnaires and medical record audits in the next 2 years were then mailed a questionnaire with 51 items which sought information about (1) provision of preventive services; (2) perceptions of health and health care preventive services; and (3) demographic information, including insurance coverage. Completion time for this instrument was approximately 30 minutes.

Approximately 2 years after mailing the questionnaire, a second questionnaire was mailed to all patients who completed the initial questionnaire.

Physician Questionnaires. Consenting physicians were given a 123-item questionnaire (completion time approximately 25 minutes) which asked for (1) demographic information (including practice workload); (2) self-estimates of provision of cancer prevention services to this patient population; (3) attitudes and perceptions about the delivery of prevention services; and (4) personal recommendations for services. Approximately 2 years later, all consenting physicians were again asked to respond to a mailed questionnaire.

Medical Record Audit. At the beginning of the study and 2 years later, the practice medical records of consenting patients were audited for evidence of provision or receipt of the previously listed 11 prevention services. Audits at both times covered services provided during the previous 3-year period; thus, we included in our analysis the data for the overlap year (year 3). Because 60 patients matching the gender and age-sampling requirements could not be identified for all eligible physicians, minimum audits for 10 women and for 5 men were included in the study database. If fewer than 10 or 5 audits, respectively, were completed for patients of a single practitioner, then the entire gender group of audit data was omitted from the database.

Practice Questionnaire. In separate telephone interviews, a single group practice physician, nurse, and business manager were each asked a similar series of questions about practice demographics (e.g., numbers and types of practitioners; fraction of patients in HMOs), organizational structure, policies, and procedures. These interviews were conducted at the beginning of the study and 2 years later.

Interventions. This randomized clinical trial consisted of a control group of practices and three intervention groups of practices. All groups had a 1-hour ''feedback'' meeting in the clinic at a mealtime at which the investigators presented an oral and written summary of aggregated specific practice data derived from preliminary

patient questionnaires, medical record audits, and physician questionnaires about provision of 11 preventive services. The feedback data summary compared physician reported frequency, patient reported frequency, and medical record evidence of a discussion of and the provision of prevention services performance rates for 11 services for the specific group practice.

Following this, using a blocked randomized assignment, the three intervention groups had two additional 2-hour meetings. In all intervention groups, physicians were asked to reach consensus on minimal prevention goals for healthy adults 50 to 65 years of age. This task involved compiling a list of counseling, procedures, immunization, and periodic health visit goals and then reaching agreement on inclusion, exclusion, and frequency with which these should be accomplished. The investigators, acting as facilitators, recorded the conclusions, and mailed a written summary to all participating physicians in the group for their review before final approval at the next meeting.

The agendas for the second part of the intervention meeting and the entire second intervention meeting varied in the critical decisions addressed according to intervention group: (1) Practice system changes to better address the consensus goals (n = 10). Specific roles of clinic personnel, use of chart reminders and stamps, introduction of audit procedures for monitoring the consensus activities—practices chose which of these to do. (2) A letter to activate patients and plan responses of the practice to patients who initiated questions about preventive services (n = 10). Using a template provided by the investigators, these letters to patients contained explicit information on the preventive services and recommended frequencies, as well as specific strategies patients could use to obtain these services. (3) Both practice system and patient letter activities (n = 11). In this condition, both strategies were employed. In all conditions, critical decisions served as a plan for taking concrete steps toward implementing change. These steps were summarized in a letter to each practice at the conclusion of the third intervention meeting. After the intervention meetings, no further support or monitoring of practice activities was done.

Specific Variables Used to Measure Constructs in the Consensus Model (*Fig. 1*). The following variables were for each consecutive (left to right) construct in our consensus model: the forenamed 11 services, physician attendance at intervention meetings, achievement of consensus, ratios of non-physician practitioner/physician staff, preexisting prevention screening policies and HMO membership percentage, patient reports of staff recommendations for specific services and annualized rates of services.

Statistical Methods

Analysis. The intervention analysis was conducted based on two definitions of possible intervention program success. The first definition was considered a conservative assessment of program success. This assessment only considered post-intervention improvement in preventive services, for example, if a patient did not have the specific preventive service occurring in the pre-intervention baseline but subsequently received the service in the post-intervention period. The second definition was considered a liberal assessment of program success. This definition added patients to the conservative assessment by incorporating those patients who received services in both pre- and post-intervention periods. For counseling services, the 3-year pre- and post-intervention periods included a common third year.

Because patients were nested under physicians, who were in turn nested under specific group practices, a multilevel analysis strategy was conducted. The patient-level information about receiving or not receiving a preventive service, based on the two definitions (liberal and conservative), was assessed as a dichotomous occurrence for each of 11 preventive services.

Multilevel Logistic Regression Model. Because the analysis concerned information at multiple levels, we chose an analytic framework based on a multilevel philosophy and constructed 12 three-level hierarchical logistic regression models, 1 model per preventive service (12 models were constructed due to separate gender analysis for rectal procedures). This logistic regression approach simply modeled each dichotomous outcome measure as a function of three treatment dummy variables (using control group as reference), over the three levels (patient, physician, and group practice). In modeling these outcomes, we let π_{ijk} be the probability that the ith patient seen by the jth physician in the kth group practice received the preventive service. We then defined this probability as a function of an intercept and three explanatory variables (treatment dummies) as follows:

$$\log it(\pi_{ijk}) = \beta_{1jk}x_1 + \beta_2 x_{2ijk} + \beta_3 x_{3ijk} + \beta_4 x_{4ijk} \qquad (A)$$

In the above equation, x_1 (with no further subscript) takes the value 1 for all respondents. Its coefficient β_{1jk} indicates that we are modeling the intercept in this relationship as random at both levels of physician and group practice. The variables x_{2ijk} to x_{4ijk} are the $k - 1$ treatment dummy variables, using the control group as reference. Their coefficients indicate that they are also random at both levels of physician and group practice. Equation A was then adjusted to model k treatment dummy variables, each being random. This allowed estimates of variation at the physician and clinic levels for each treatment condition. A priori test of the difference in variation between the control group and the three other treatment conditions indicated no significant differences in the variability in the proportion of procedures conducted at the physician and clinic levels (results are not presented to save space).

Similarly, Eq. A was adjusted in a stepwise fashion to incorporate the various theoretical covariates based on our consensus model for preventive services delivery, provided in Fig. 1. Incorporation of these covariates added little to the understanding of the treatment effects by indicating no significant change in the original treatment effect estimates.

Results

Baseline data were collected between April 1991 and September 1992 (time 1) and reflect services delivered

during the time period 1988 to 1992. The interventions were conducted in 1991 to 1992. Post-intervention data were collected in 1993 and 1994 (time 2) and reflect services delivered between 1991 and 1994.

Samples, Participation Rates, and Demographics. At the 42 group practices, 172 physicians consented to study participation: 163 (95%) completed the questionnaire pre-intervention; 157 (91%) were practicing in the same group at the time of the 2-year follow-up; and 143 (83%) completed both the pre- and 2-year post-intervention questionnaires. Eighty percent (n = 137) of the 172 consenting physicians attended the feedback meeting for all groups. Consenting physician attendance at the two-intervention meetings averaged 80%.

The 3,286 patients, whose data are reported here, are described in Fig. 2. They were 24.5% of the individuals from 42 practices who were initially identified as eligible. The demographic characteristics of the study patients by insurance status (HMO versus non-HMO) are described in Table 1. The demographic characteristics of the 5,425 patients found eligible by questionnaire, consenting and with demographic data, and the total study population are insignificantly different (data not shown). Demographic characteristics of the physicians and of the practices indicated that almost 80% of physicians were male, 90% were Caucasian, three quarters were family physicians, and median age was 40 years. Consenting and participating physician groups were very similar. Practices were slightly more often urban than rural. The clinical and support staff to physician ratios did not change meaningfully in the practices over the duration of the study. The study patient sample (n = 3,286) is demographically similar to the larger eligible patient sample (n = 5,425). The study protocol did not allow for collection of demographic data on patients initially identified who did *not* participate and consent (see Fig. 2). HMO and non-HMO subsets differ from each other in that HMO patients are more likely to be male, better educated, have a larger annual household income and to be employed full-time.

Medical record data are not included for female patients of 8 physicians, for male patients of 15 physicians, and for all patients of 18 physicians because the minimal numbers of patients to be audited for these doctors were not available.

Patients' records revealed a median of 2.33 visits annually before and 2.5 after the intervention. Health maintenance visits averaged a median of 0.33 visits annually before and 0.5 after the intervention.

Physician and clinic manager estimates of the proportion of clinic patients who were HMO members correlated highly with patient reports of HMO membership, aggregated to the clinic level.

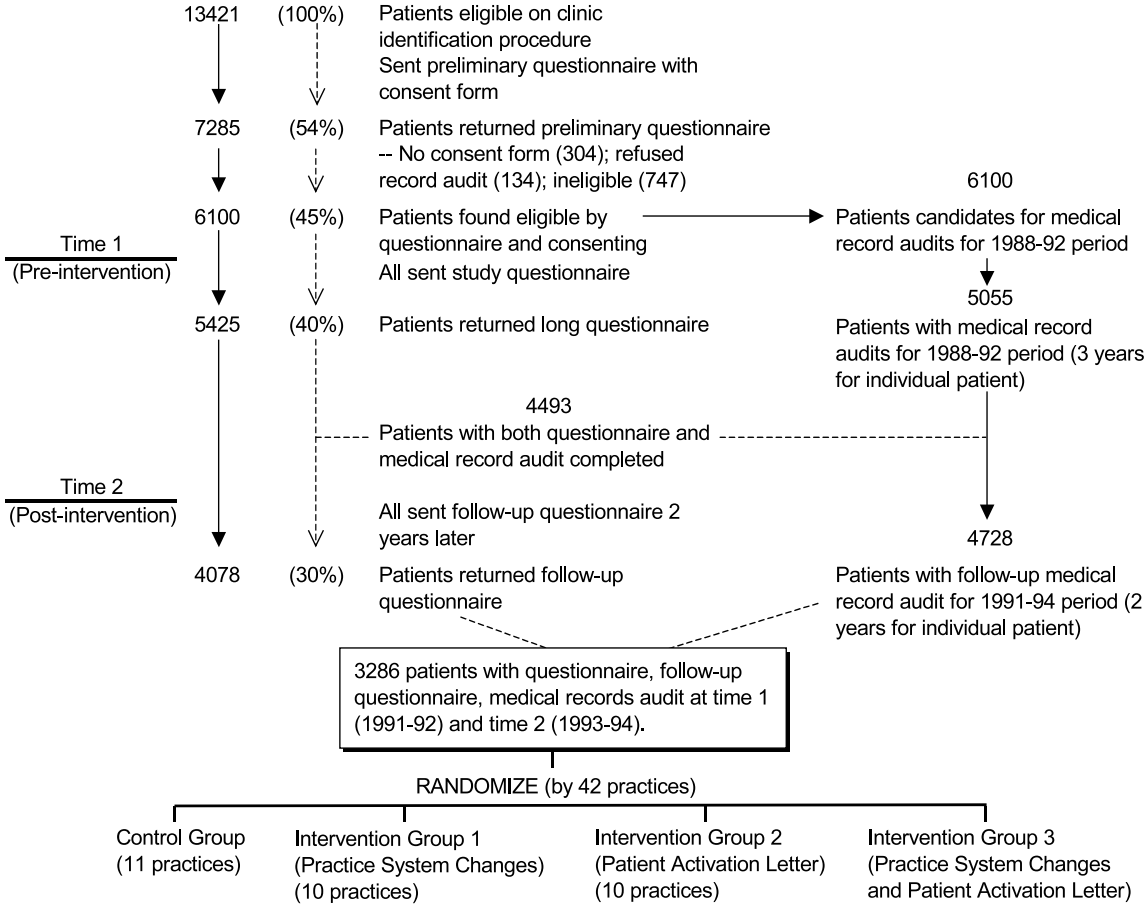

Figure 2. Study data samples for patients of 172 physicians at 42 clinics.

Table 1. Demographic characteristics of the patient samples

	Study patient sample (N = 3,286)*			
	HMO patients (n = 999)		Non-HMO patients (n = 2,256)	
	n	%	n	%
Race				
Caucasian	969	97.0	2,227	98.7
African-American	9	0.9	2	0.1
Asian/Pacific Islander	5	0.5	5	0.2
American Indian	2	0.2	7	0.3
Hispanic	3	0.3	4	0.2
Other	7	0.7	4	0.2
(Missing)	4	0.4	7	0.3
Gender				
Female	633	63.4	1,533	68.0
Male	366	36.6	703	31.2
Marital status				
Married	828	82.9	1,867	82.8
Widowed	65	6.5	179	7.9
Divorced	76	7.6	126	5.6
Never married	23	2.3	70	3.1
Separated	3	0.3	12	0.5
(Missing)	4	0.4	2	0.1
Education				
8th grade or less	33	3.3	119	5.3
High school	402	40.2	1,142	50.7
College	558	55.8	989	43.8
(Missing)	6	0.6	6	0.3
Annual household income				
Less than US$20,000	171	17.1	569	25.2
US$20,001-$60,000	597	59.7	1,302	57.7
>US$60,000	164	16.4	228	10.1
Don't know or missing	67	6.7	157	6.9
Employment status				
Full-time	527	52.8	1,001	44.4
Part-time	152	15.2	382	16.9
Full-time homemaker	115	11.5	312	13.8
Disabled	25	2.5	94	4.2
Retired	151	15.1	398	17.6
Unemployed	23	2.3	51	2.3
(Missing)	6	0.6	18	0.8

*Thirty-one cases had missing data for the variable used to identify HMO status.

Rates of Counseling and Screening Procedures. Patients reported that they received counseling about five cancer prevention subjects (Table 2) at least once during a 3-year time frame at rates from 67% to 89%. During the 6-year period of the study, rates for diet counseling fell by 4%, whereas rates for periodic health visit recommendations rose by 3% (Table 2).

Annualized rates over 2-year periods, according to medical record audits for six screening procedures, ranged from 12% for fecal occult blood testing to 41% for mammography (Table 2). Three procedures occurred at least once in the post-intervention time period at much higher rates: rectal examination in men and women (69% and 64%), and mammography and clinical breast examination in women (54%). During the entire study period, rates increased for mammography, clinical breast examination, and rectal examination rates; rates decreased for fecal occult blood testing.

HMO membership according to patient reports was associated with higher rates of all six screening procedures in both the pre- (1988 to 1992) and post-intervention (1991 to 1994) study periods (Table 3).

Patient reports of practice staff recommendations about each of the six screening tests were significantly related to both medical record evidence of having each procedure both before and after the interventions and physician reports of providing the services (P = 0.001 for each).

Other hypothesized clinic-level variables (Fig. 1), specifically enabling mechanisms of provider-mix and preexisting practice prevention policies, were not associated with greater rates of performance for any of the 11 prevention activities.

Physician Consensus on Prevention Activities and Impact of Patient Activation and System Change Facilitation Interventions. The 31 physician intervention groups reached consensus on the inclusion and periodicity for each of the 11 prevention activities. The majority of groups agreed to recommend all 11 counseling and screening procedures, usually at annual intervals. All groups recommended sigmoidoscopy at intervals of 3 years or more; some groups recommended Pap tests at 2- or 3-year intervals; and some groups recommended addressing some prevention service at every visit, such as assessing smoking status.

Table 2. Overall counseling (at least once in 3 years) according to patient reports and screening (annual) rates according to medical record audit before (1988 to 1992) and after (1991 to 1994) the interventions

	Reported at least once in 3 years					
	Before				After	
	%	(*n*)			%	(*n*)
Counseling						
Smoking assessment	77	(3,260)			77	(3,249)
Smoking counseling	89	(487)			89	(440)
Breast self-examination	70	(2,158)			71	(2,136)
Diet	71	(3,286)			67	(3,286)
Periodic health visit	69	(3,256)			72	(3,251)
	Once each year for two consecutive years				At least once in last 2 years	
	Before	88-90	After	92-94	After	
	%	(*n*)	%	(*n*)	%	
Screening procedure						
Mammogram	34	(2,212)	41	(2,212)	54	
Clinical breast exam	33	(2,212)	39	(2,212)	54	
Fecal occult blood test	16	(3,286)	12	(3,286)	40	
Cervical Pap test	28	(2,212)	29	(2,212)	45	
Rectal examination men	20	(1,074)	25	(1,074)	69	
Rectal examination women	21	(2,212)	25	(2,212)	64	
					Before	After
					% (*n*)	% (*n*)
Sigmoidoscopy					18 (2,212)	17 (2,212)

The effects of group interventions on annualized probabilities for all 11 prevention activities were investigated according to the two definitions of possible program success (conservative and liberal). Multilevel logistic regression analysis indicated limited statistically significant effects. When compared with the control condition, effects were detected, based on the conservative definition of success, for clinical breast examinations, smoking counseling, and female rectal examinations; however, only the finding for smoking counseling was in the predicted direction, showing a significant increase in counseling for the intervention group that sent a patient letter compared with the control group. In all groups over the study period, annualized provision of services increased by approximately 15% (conservative definition).

The multilevel logit models also allowed investigation of higher levels of performance variability at physician and clinic levels. Due to the nature of the conservative definition, providing small numbers of prevention events nested under the higher levels, particularly the physician level, variability estimates were difficult to obtain, thus resulting in a high proportion of zero variance estimates that are not useful for interpreting an intervention effect.

A variability analysis based on the liberal definition provided larger nesting and subsequently more confidence in the variance estimates. The results indicated that the control group maintained significantly larger variability in the provision of fecal occult blood tests, periodic health visits, Pap tests, and smoking assessment than any of the treatment conditions at the clinic level. One conclusion from this finding is that treatment reduced between-clinic variability within each treatment group, but did not effect between-group variability in the control group. No significant between-physician variability was detected in any of the groups. (Detailed data from the analysis reported in this section will be provided by the authors on request.)

Discussion

In attempting to describe and change favorably the levels of cancer prevention services received by populations, sampling, methodologic, theoretical, and analytic challenges confront investigators. The search for generalizable results and conclusions is daunting.

The current study patient population is defined primarily by its association with a regular primary care

Table 3. Overall screening rates (by medical record audit) for HMO and non-HMO members (according to patient reports) before and after interventions

	No HMO		HMO	
	At least annually for 2 years			
	Before	After	Before	After
Mammogram	33%	39%	38%	46%
Clinical breast examination	32%	37%	37%	43%
Fecal occult blood test	15%	10%	19%	15%
Cervical Pap test	26%	27%	32%	33%
Rectal examination males	19%	23%	21%	28%
Rectal examination females	20%	24%	25%	28%
At least once in 2 years				
Sigmoidoscopy	16%	16%	22%	21%

provider (whose group was interested in prevention issues by virtue of study participation) and then patient willingness to participate in a prevention services study. These features have been associated with higher rates of cancer screening (26). However, the demographics of this patient population are *not* strikingly different from the randomly selected regional population of adults sampled by telephone in the behavioral risk factor survey (27).

The multiple sources of data, non-academic practices, and longer time frames of services delivered are key features of the study reported here (28).

From a theoretical perspective, there are challenges both in the scope of primary care practice and the diversity of patient problems and expectations. The important variables must be studied in the complexity of the primary care setting using methods that not only isolate the phenomenon under study from its context but also include the measurement and assessment of the effect of context. In the current study, we attempted to expand our data and model to include patient, physician, and practice-level variables. Recent authors and the results or our intervention suggest that the dynamics of medical practice are a critical issue (29, 30).

Principal Study Descriptive Findings. Our intervention, consisting of facilitating intervention meetings that focused on the physician consensus-building combined with patient activation and/or systemic change, had no consistent impact on rates of performance for any of the 11 prevention activities. Beyond ''ceiling'' rates, there may be other explanations for this absence of benefit. We hypothesized five requisites for optimal provision of these services. With respect to the first—awareness of performance—while we could not quantify our perception, we surmise that groups concluded that their performance was, in fact, good and thus the detailed feedback was, in fact, counterproductive. Given our methods, we could not present ''gold standard'' data from other sources, and we did not suggest specific performance goals. In fact, the literature at the time suggested that providers in general were poor at delivery of prevention services. Therefore, groups were free to conclude that their performance was, in fact, good, and thus no motivation for change was developed from feedback.

Our second hypothesized requisite—that group consensus on standards was necessary—may have been irrelevant to the study physician population circumstances because such consensus was largely present, even though few practices had published prevention guidelines. However, putting that consensus into practice may be considerably more challenging than the concepts of Greer (16) suggested.

The third hypothesized requisite—active involvement of physicians—may have been relevant, and our intervention did show some evidence of jump-starting discussions and action plans. However, our two 2-hour intervention meetings may have been insufficient to truly achieve the level of physician involvement necessary to change behavior or implement plans that could lead to measurable prevention rate changes. This conclusion seems supported by data in several studies about positive effects of booster or computer-reminder interventions (13-15, 31).

Our fourth hypothesized requisite—implementation of enabling mechanisms—may have again been correct, but our interventions were weak. Our finding that staff reminders to patients about activities were strongly associated with receiving services supports the significance of enabling mechanisms. In other studies, a more structured approach, with specific goal setting, modification of specific office procedures, and follow-through to assure that stated changes were actually implemented, has been described (32). Because few practices had nonphysician providers, we had insufficient power to detect differences related to this provider mix.

Finally, with respect to our fifth hypothesized requisite, our intervention directed to patient activation may have also been appropriate but weak (32, 33). The significant association of HMO membership with higher rates of five procedures (as much as 6.5% greater) emphasizes the importance of an enabling mechanism outside of individual, practitioner medical system control. Furthermore, the higher post-intervention rates of smoking counseling reported by subjects in the patient activation condition suggest that even a brief, written statement about the scope of preventive services available can impact utilization of these services.

The results reported here are consistent with those found in similar intervention studies over the last decade. Dietrich et al. (32, 33) has emphasized the need for intense ''adequate'' assistance. Solberg et al. (34) found limited impact in a systems intervention study. Burack et al. (11) found that reminders for cervical Pap tests had a limited impact. Manfredi et al. (35) found benefit from reminders, but there were very low levels of services in their studied populations. Williams (36) found that an intense staff-activated computer reminder system for patients led to increased screening procedures. A recent meta-analysis of preventive-intervention studies concluded that health organization changes may be effective in increasing use of these services (37).

What is striking in the reported data are the patient-reported high rates of smoking assessment (77%), recommendations for periodic health visits (72%), and counseling given to smokers (n = 487; 89%). These are areas where there is considerable consensus among advisory groups. Similarly, for widely accepted screening procedures, while annualized rates may be considered ''low,'' 40% to two thirds of the populations had each of five procedures at least once in the last 2 years, according to medical record audits. While examining a longer window of screening with sigmoidoscopy (3 to 5 years) would be more consistent with the consensus recommended frequency for this test, this was not possible. To get an estimate of the rate of this screening for our sample, we estimated frequency of the procedure in a 2-year window. Only tests done by the specific group practice or known about and documented in the medical record of that practice were counted; our methods may have thus underestimated actual procedure rates because some were obtained elsewhere. Other circumstances may make the levels or service found in our study more optimal performance levels than are often acknowledged. Individual patient health status, such as the barrier of certain chronic disease conditions (38), history of hysterectomy (present in 40% of women studied), and economic status (e.g., annual household income less than US$20,000 in 23%

of sample; less than US$30,000 in 44%) may certainly influence what is best possible care for individual patients. The favorable HMO membership effect supports such an interpretation.

The most comparable source of data to those in this study on the frequency of periodic health visits and screening mammography, clinical breast examinations, and cervical Pap tests is from the Wisconsin Behavioral Risk Factor Survey (27). In 1999, 59% of adults over age 45 in that survey reported having a routine check-up in the past year, compared with 69% and 72% of study subjects here reporting such a visit at least once in the last 3 years (for 1988 to 1992 and 1991 to 1994; Table 2). Among survey women over 50, in the previous year, 58% reported having had a mammogram, 64% a clinical breast examination; and in the past 3 years, 58% reported having had a cervical Pap test (27). Table 3 shows the annual and last 2-year rates for the population reported here; the rates are somewhat comparable. Kottke et al. (39) found that approximately two thirds of adult patients surveyed in the Midwest reported being up to date in their receipt of similar prevention services. Weinick and Beauregard (40) and Burack et al. (41) noted differences similar to those reported here between HMO and fee-for-service patients.

The importance of periodic health visits as a facilitating mechanism for receipt of the specific health services studied here, seems to be a belief shared by the clinicians we studied (Table 3); 70% of patients reported provider recommendations that they have such health examinations. Current American health care delivery systems have to address multiple, widely varying service demands from patients (42).

In contrast with concerns that cancer counseling and screening services are not being provided as frequently as the data on efficacy urge, we found that, in nonacademic primary care group practices in the upper Midwest, rates for such prevention services among regular practice adult patients were high. A physician consensus approach for systems intervention or a patient activation did not impact on rates of these services.

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