

How Important Are Clinician and Nurse Attitudes to the Delivery of Clinical Preventive Services?

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BACKGROUND. The purpose of this study was to determine the relation between primary care clinic physician and nurse attitudes toward preventive services and the rates at which their clinics provide these services to their adult patients.

METHODS. Forty-four private primary care clinics contracting with the sponsoring health maintenance organizations were recruited for a randomized controlled trial of an intervention consisting of training and consultation in continuous quality improvement and office prevention systems. Before the intervention began, 647 clinic physicians, midlevel practitioners, and nurses in the 44 participating clinics completed a questionnaire addressing their attitudes toward prevention, and 6830 patients visiting those clinics completed a questionnaire about their own up-to-date preventive care status as well as clinic actions to provide eight important preventive services during the visit. Scales were developed from significantly intercorrelated sets of attitude questions. Correlations were calculated by clinic for the relation between mean provider scores on those scales and specific service rates.

RESULTS. The questionnaire provided three scales with high internal consistency reliabilities that appear to measure generally favorable attitudes toward preventive services and toward improving them in an organized way. There was little association between these attitudes and rates of providing preventive services.

CONCLUSIONS. While favorable attitudes may be helpful, they are clearly insufficient to affect the actual delivery of preventive services. There is reason to believe that preventive services rates could be improved more effectively by targeting factors related to the provision of preventive services, particularly those that shape the clinical environment in which clinicians work.

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Despite the establishment of rather modest national goals for the delivery of preventive services to meet the targets of *Healthy People 2000*¹ and of evidence-based guidelines from the United States Preventive Services Task Force (USPSTF),² current rates of many clinical preventive services still could be substantially improved.³⁻⁵ In general, preventive guidelines have achieved a high degree of acceptance among primary care physicians,⁶⁻⁸ although there is some disagreement with USPSTF recommendations to stop performing some screen-

ing tests entirely or to reduce the frequency with which they are utilized. Thus, the underuse of recommended screening tests and other services is yet another example of how guidelines are probably important but certainly insufficient by themselves to achieve the desired effects.⁹⁻¹⁵

As the problem of implementing guidelines gains increasing attention, the authors and others have studied and discussed the barriers to clinical behavior change.^{13,16-18} Physician and patient attitudes are invariably included in these lists of barriers, as well as in nearly all recommendations for facilitating change. How do the attitudes of clinicians and nurses really affect the delivery of various preventive services in primary care settings? Do favorable attitudes lead to or correlate with more effective delivery? How much effort should be put into trying to strengthen favorable attitudes?

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While previous literature addressing these questions is largely limited to surveys and theorizing about constructs, some have compared the opinions of a group of clinicians about preventive guidelines with their actions, as reflected in record documentation. Woo et al,³ for example, found that faculty and residents at Brigham and Women's Hospital in Boston did not live up to their own recommendations for preventive services most of the time, performing either too few or too many tests. Weingarten et al¹⁰ found a similar inconsistency in a health maintenance organization (HMO) primary care physician group, despite widespread support among them for preventive guidelines. Rosser and Lamberts¹⁹ have described and puzzled over this gap between physician perceptions of their prevention behaviors and their actual measured performance.

Understanding the contribution of favorable attitudes toward preventive services and guidelines is complicated by other factors affecting clinical behavior. There is an increasing realization that the practice environment is probably the most important behavioral barrier, and that the creation and maintenance of organized office systems to make that environment more prevention-friendly is the most needed change. Recent studies by many investigators, as well as a report by the American Cancer Society Advisory Group on Preventive Health Care Reminder Systems, have emphasized that the major vehicle for improved clinical preventive services is the establishment of office systems that are conducive to meeting prevention needs during the course of normal patient care.^{13-15,20-28} The federal initiative in support of implementing the USPSTF recommendations, entitled "Put Prevention Into Practice," is also built largely on that concept.²⁹ Nevertheless, it is not yet known how the implementation or maintenance of these office prevention systems can be facilitated in medical practices.^{30,31}

In the authors' experience in research, teaching, and working with many primary care practices over the years, they have been repeatedly impressed by how difficult it is to accurately predict the prevention behavior of physicians and their practices. In particular, there has seemed to be little relation between the desire to deliver preventive services and the presence of the office prevention systems that seem so critical to successful prevention efforts. Furthermore, there is a widespread assumption that

providing attitude-changing experiences in medical school or practice is the main way to improve preventive services delivery. Therefore, the current study was undertaken when a large preventive services research grant from the Agency for Health Care Policy and Research provided an opportunity to measure relevant attitudes and compare them with the delivery rates of preventive services.

Under the AHCPR grant, the IMPROVE (Improving Preventive Services through Organization, Vision, and Empowerment) Project is a randomized controlled trial designed to determine whether managed care organizations can increase preventive services rates by facilitating the development of effective office prevention systems in the private primary care clinics with which they contract. This study objective was to be accomplished by means of providing training and consultation in office systems and in the concepts of continuous quality improvement (CQI).^{32,33} As part of the evaluation of this trial, physician and nurse attitudes about prevention and office systems were measured and patients were randomly surveyed about the prevention services offered to them during office visits.³⁴

These baseline physician/nurse and patient surveys in the 44 private clinics recruited for the trial provided the opportunity to test the hypothesis that there would be a relatively weak relation between supportive attitudes and the delivery of eight adult preventive services. The eight services included in this trial were chosen because they represent a full range of diverse service needs and are widely supported as important, including by most clinicians (Table 1). The ages and frequencies for services listed in Table 1 reflect a compromise between targets selected by *Healthy People 2000*¹ and the USPSTF² as opposed to the the need for some common age and frequency groupings for research purposes.

The clinics recruited for this trial were all in the greater metropolitan area of Minneapolis and St Paul and had contracts with one or both of the HMOs sponsoring the trial. They ranged in size from 1 to 28 primary care physicians with a mean size of 8. Their patients had the full range of insurance arrangements and, although 45% of their patients were covered by managed care plans, an average of only 19% of their patients had coverage with the two sponsoring HMOs (Table 2).

METHODS

SURVEY INSTRUMENTS

The Provider Attitude Survey (PAS) was adapted from a similar survey used in the "Doctors Helping Smokers" clinical trial.³⁵ The adaptation involved broadening the questions to cover the eight services in the IMPROVE trial, changing the wording to make it relevant to office nursing staff as well as physicians, and adding concepts learned from the previous work.¹⁷ It included 25 questions that addressed the following:

1. Personal and perceived organizational importance of, and desire to improve, preventive services in general and the eight preventive services targeted in the IMPROVE trial in particular
2. Personal and organizational interest in using a systems approach for preventive service improvement
3. Personal support for teams and delegation
4. Personal belief about the interest and willingness of patients to change behaviors to improve health
5. Perception of colleague and clinic support for change
6. Concern about time and reimbursement.

A patient survey, called the Patient Recent Visit Survey (PRVS), was administered at baseline to adult patients soon after a clinic visit. The details of this survey and its administration have been described elsewhere.³⁴ The main purposes of the PRVS were to determine the patients' self-reported need for the eight preventive services targeted in this study (Table 1) and to elicit their report of whether the services were recommended or provided at the visit. The questionnaire included 128 questions in the version for women and 91 questions in the version for men. Both instruments were pretested several times and modified after an analysis of both subjective comments and objective identification of questionable areas.

DATA COLLECTION

The PAS was administered at each clinic to primary care physicians, midlevel practitioners, and nurses working in primary care areas. The survey was conducted during a group meeting for all targeted personnel who were in the clinic on the survey day(s).

The PRVS necessitated a much more complex

TABLE 1

Target Preventive Services

Cancer Screening

- Clinical breast examination every 2 years from age 50
- Mammography every 2 years from age 50
- Papanicolaou smears every 2 years from age 20

Heart Disease Risk Factor Screening

- Tobacco use at each visit from age 20
- Blood pressure at least yearly from age 20
- Blood cholesterol every 5 years from age 20

Immunizations

- Influenza yearly from age 65
- Pneumococcus once from age 65

sample selection and administration. The clinic was the unit of analysis for the larger randomized trial, and the primary comparison was the change in the mean rate of providing each preventive service from pre- to post-intervention. The design therefore called for the same number of patients to be sampled from each clinic from each of five age/sex categories (cells), regardless of the relative size of any clinic or

TABLE 2

Characteristics of the 44 Participating Clinics

| Characteristic | Mean | SD |
|--------------------------------|------|------|
| Clinic age, y | 31.0 | 23.9 |
| No. of primary care physicians | 7.7 | 5.3 |
| No. of primary care nurses | 13.8 | 12.2 |
| No. of patient visits/wk | 721 | 572 |
| Minority patients, %* | 9.0 | 12.1 |
| Patient insurance status, % | | |
| Prepaid (HMO/PPO) | 44.8 | 23.3 |
| Blue Plus | 9.3 | 10.7 |
| HealthPartners | 9.9 | 14.0 |
| Other private insurance | 20.2 | 18.6 |
| Medicare | 0.7 | 8.3 |
| Medical assistance | 10.6 | 12.3 |
| Self-pay | 8.2 | 7.6 |
| No insurance | 5.7 | 4.5 |

*Minority indicates self-reported race other than white.

SD denotes standard deviation; HMO, health maintenance organization; PPO, preferred provider organization.

the relative age/sex distribution of its patients. This design produced the following cells: women 20 to 49, 50 to 64, and 65+ years old, and men 20 to 64 and 65+ years old.

Just before the intervention in September 1994, the authors drew names from appointment records provided by the participating clinics for randomly selected days. The names of patients who had seen a clinician were consecutively drawn for the survey sample until enough had been obtained to fill each of the five age/sex cells. When the number of patient names on a particular day's record was greater than the number needed to fill a particular age/sex cell, the names of patients on the log were selected at random (instead of consecutively) until the precise number of names needed to fill the category was reached.

An independent vendor who was provided with these selected names mailed gender-specific questionnaires at a median interval of 8 days after the patient's visit, along with a cover letter from the patient's physician and \$1 as a thank you for replying. The vendor tracked the questionnaires as they were returned. Following the recommendations of Dillman,³⁶ approximately 1 week later, the vendor mailed a reminder thank-you postcard to all subjects and another questionnaire to nonrespondents 2 weeks after that. Telephone follow-up interviews were then attempted by the IMPROVE staff (a maximum of 12 calls) to those who had not responded 10 to 20 days after the second questionnaire was mailed. All data collection procedures were completed by mid-January of 1995.

DATA MANAGEMENT AND ANALYSIS

Provider Attitude Survey. The PAS questionnaires collected from clinic staff were scanned into a database, verified, and summarized, by individual as well as by clinic. Scales to measure three facets of attitude toward preventive services had been previously formulated, based on analysis of the PAS pretest questionnaire response data. This was accomplished by identifying three sets of significantly positively intercorrelated items (indicators), each representing one of the several content domains built into the PAS. When response data from each set were analyzed using the SPSS REL procedure, with negatively stated items reverse-scored, any items that did not independently contribute to the overall internal con-

sistency of the set were deleted. Therefore, from each set, only the items that progressively maximized their aggregate internal consistency reliability (as measured by Cronbach's alphas of 0.76 to 0.95) were then used to form simple additive scales. These scales and their reliabilities were verified with the full baseline PAS data set. The statements (questionnaire items) that comprise each of those scales and the names that describe the apparent commonality of their respective sets are listed in Table 3.

Patient Recent Visit Survey. After verification, patient survey responses were aggregated by clinic and were adjusted for age and sex in proportion to the US population, as defined in the 1990 US Census.³⁷ This weighting method allows the reader to compare rates to a standard population.

When statistical tests for subgroup differences were performed using these weighted data, the numbers of respondents were also rescaled in the weighted proportions so that they would be equal in total to the original total number of respondents. Thus, the degrees of freedom for the statistical tests were not changed by the weighting process.

The rates from patient data that are reported for each service are based on the denominators of all individuals who were eligible by age and sex for the service being reported. Although data pertaining to tobacco use were limited to current users for the sake of simplicity, they closely reflect activities reported by both users and nonusers who responded.

Even though the rates of providing preventive services represent clinic means, they are not substantially different from the aggregate means for individual patients. Clinic rates were chosen not only because of the overall need to make group comparisons but also because of the need to recognize that whole clinics create clusters of similar activities and patients. The responses of clinic personnel were analyzed on the basis of clinic means for the same reason.

ANALYTIC METHODS

With clinic as the unit of analysis, both Pearson product moment and Spearman rank order correlations were computed between (1) mean provider attitude scale scores within clinic and (2) clinic rates of patients being up-to-date when arriving for the visit and also of services being recommended when needed by visiting patients. The number of clinics (44)

provided power of 0.80 (one-tailed) with $\alpha = .05$ to detect a correlation as small as 0.37, or a common variance of about 14% between attitudes and rates of service. Differences between within-clinic provider and nurse mean attitude scale scores were tested with two-tailed *t* tests. Scatter plots between scale 1 scores, which reflect desire for improvement and rates of service, were examined for evidence of curvilinearity or other characteristics of the relations

that might attenuate or violate the assumptions of the correlation statistics.

RESULTS

PROVIDER ATTITUDE SURVEY

We obtained 647 completed surveys from the 993 primary care physicians, midlevel practitioners, and nurses in the 44 clinics for an overall response

TABLE 3

Prevention Attitude Scales Based on Questionnaires Completed by 647 Physicians, Midlevel Practitioners, and Nurses in Participating Clinics

| Prevention Attitude Scales | Agree or Strongly Agree, % | Neutral, % | Disagree or Strongly Disagree, % |
|---|----------------------------|------------|----------------------------------|
| Scale 1: Prevention improvement desire (Rxx = 0.95) | | | |
| Our clinic should improve the way we provide these services: | | | |
| Papanicolaou smear | 30.3 | 38.9 | 30.8 |
| Mammography | 39.7 | 33.4 | 26.8 |
| Breast examination | 43.3 | 37.4 | 28.3 |
| Hypertension screening/management | 39.7 | 38.8 | 21.6 |
| Hypercholesterolemia screening/management | 37.2 | 40.9 | 21.9 |
| Tobacco cessation advice | 51.3 | 33.3 | 15.4 |
| Influenza immunization | 31.1 | 38.6 | 30.3 |
| Pneumococcus immunization | 35.5 | 39.4 | 25.0 |
| Scale 2: Support for prevention systems (Rxx=0.76) | | | |
| 1. We need to find better ways to provide PS during the course of normal patient visits. | 77.2 | 18.0 | 4.8 |
| 2. If we had systematic ways to remind me of the PS my patients need, I could do a better job. | 80.8 | 14.5 | 4.7 |
| 3. If we had systematic ways to provide support and follow-up for patients in reducing their risk factors, I could do a better job. | 84.2 | 13.1 | 2.7 |
| 4. We should create a single integrated system for provision of PS. | 56.7 | 35.1 | 8.2 |
| 5. Using teams to work on problems is a good way to improve care. | 82.9 | 13.4 | 3.7 |
| 6. Most patients want us to provide PS. | 86.0 | 11.6 | 2.4 |
| 7. Physicians can be more effective if they delegate many aspects of providing PS to clinic staff. | 63.9 | 25.5 | 10.6 |
| 8. Our clinic's current approach to PS is good enough. | 13.2 | 34.7 | 51.6 |
| Scale 3: Perceived leadership support (Rxx=0.79) | | | |
| 1. Leadership in our clinic is committed to improving the quality of PS. | 66.4 | 25.7 | 7.9 |
| 2. Leadership in our medical group is committed to improving the quality of PS. | 66.8 | 26.1 | 7.2 |
| 3. There is a respected individual in our clinic who is personally committed to leading our efforts to improve our provision of PS. | 54.6 | 32.6 | 12.8 |

Rxx denotes Cronbach's alpha; PS, preventive services.

rate of 65.1%. This included 60.7% of the 331 physicians, 52.5% of the 61 midlevel practitioners, and 68.9% of the 601 nurses.

Although individual respondents produced a wide range of standard scores (mean = 50, standard deviation [SD] = 10) for each of the three attitude scales (scale 1, range of 23 to 72; scale 2, 4 to 72; and scale 3, 14 to 67), ranges of clinic means were much tighter (scale 1, range of 36 to 60; scale 2, 32 to 56; and scale 3, 41 to 63). The mean raw scores for the physicians compared with those of the nurses with whom they worked showed that the physicians on average had slightly higher scores for scale 1 (desire to improve services), 234 ± 86 vs 210 ± 80 ($P \leq .001$), and for scale 3 (leader-

ship support), 288 ± 76 vs 260 ± 76 ($P \leq .0001$). There was, however, no difference ($P = .84$) for scale 2 (support for prevention systems), 290 ± 51 vs 289 ± 50.

The responses to the unscaled items about provider attitudes are displayed in Table 4. Although these responses demonstrate an awareness of barriers to providing preventive services, they also document an overwhelming degree of belief in the importance of the preventive services.

PATIENT RECENT VISIT SURVEY

The patient survey (PRVS) was sent to 7997 randomly selected patients and usable responses were obtained from 6830 (85.4%). Full details of the characteristics of these patients and their responses have been reported elsewhere.³⁴

Table 5 includes a summary of the rates of being up-to-date with respect to preventive services at the time of the visit and, if not, whether the needed service was offered.

Table 6 displays the correlations between these rates and the three prevention attitude scales. These correlations for each attitude scale are approximately equally split between positive and negative, and nearly all are very weak or nonexistent. Only 6 of the 48 are statistically significant, and most of these are in a negative direction.

Scatter plots of the relation between improvement desire (scale 1) and rates of services for all individuals (ie, not grouped by clinic) demonstrated that the lack of correlation was not attributable to any bimodal pattern of response (significant curvilinearity).

TABLE 4

Other Prevention Attitudes Toward Preventive Services

| Statement | Mean Clinic Responses in % (N=44) | | |
|---|-----------------------------------|--------------------|-------------------------------|
| | Agree or Strongly Agree | Neutral | Disagree or Strongly Disagree |
| My colleagues believe PS are an important part of their role. | 95.0 | 2.9 | 2.1 |
| I am willing to work on improving PS. | 2.8 | 0.2 | |
| Our doctors are willing to work on improving PS. | 84.7 | 13.5 | 1.9 |
| Our nurses are willing to work on improving PS | 91.1 | 7.5 | 1.4 |
| There are few barriers to improving PS. | 48.7 | 31.0 | 20.3 |
| Time is not a problem for providing PS. | 14.6 | 12.6 | 72.8 |
| I would provide more PS if insurance would pay for them. | 57.5 | 30.5 | 11.9 |
| Patients will not make changes to improve their own health. | 21.0 | 26.2 | 52.8 |
| | Important or Very Important | Somewhat Important | Not Important |
| It is important that patients have: | | | |
| Papanicolaou smears | 99.8 | 0.2 | — |
| Mammograms | 99.8 | 0.2 | — |
| Breast examinations | 98.6 | 1.2 | 0.2 |
| Hypertension screening | 98.4 | 1.4 | 0.2 |
| Cholesterol screening | 95.5 | 4.2 | 0.2 |
| Stop smoking advice | 90.6 | 8.8 | 0.6 |
| Influenza shots | 84.4 | 15.1 | 0.5 |
| Pneumonia shots | 81.9 | 16.4 | 1.8 |

PS denotes preventive services.

DISCUSSION

These results demonstrate that the physicians and nurses in primary care in the participating clinics report strongly favorable attitudes toward the provision of preventive services, both in general and in particular for the eight services included in this study. From 81% to 99% of these physicians and nurses believe it is important or very important that each of these eight services be provided, and 95% of them believe that their colleagues perceive prevention as an important part of their role. There is also considerable support for systems to support clinical prevention efforts (scale 2) and for the belief that their clinical leaders are committed to improving prevention (scale 3).

There appears, however, to be considerably less agreement about whether the current performance level needs improvement (scale 1). When asked about specific preventive services, only a minority of respondents agreed that their clinic should improve each of these services, with the exception of tobacco cessation. Despite this ambiguity, the great majority of respondents report that both they and their colleagues are willing to work on improvement.

When the clinic mean scores on three attitudinal scales were compared with the actual clinic rates of delivering services, however, there was little evidence that the attitudes were associated with the rates of providing the services in individual clinics. Only six correlations ranging from -0.46 to +0.32 were significant at the .05 level, and four of these were negatively related; ie, the greater the desire was to improve or to support systems, the worse the service rate. The only statistically significant positive associations with service delivery rates were for tobacco identification and advice, and they were correlated only with scale 3 (committed leadership).

What stands in the way of a more direct translation of attitudes to behavior? Although only 20% of the respondents disagree with the statement that there are few barriers to providing preventive services, most (73%) agree that time is a major issue. In contrast, there seems to be widespread recognition by 86% of physician and nurse respondents that patients

want their health care providers to offer preventive services. The only other barriers addressed in this questionnaire were lack of insurance coverage and unwillingness on the part of patients to change in order to improve their health. Insurance coverage appears to be regarded as a much bigger problem than patient attitudes.

Certainly the current preventive services status of patients and clinic efforts to improve that status are in need of improvement. This is especially true with respect to recommending services needed by individual patients during their visits. Except for taking blood pressure, which is now a nearly universal part of seeing patients, and providing tobacco cessation advice, only 6% to 29% of the patients needing particular services are receiving recommendations for those services during an office visit.

One could interpret this general lack of correlation between preventive service rates and desire to improve (scale 1) in various ways. For example, it is possible that some clinicians who perceive that their preventive services rates are low might want to improve these rates, while others are less eager to do so because of the difficulties they perceive in accomplishing that improvement. Similarly, clinicians with high rates might include those who feel that there is not much need or possibility to improve further as well as those who want to try anyway. Scatter plots

TABLE 5

Mean Clinic Preventive Services Rates by Patient Self-report (N=6830) at an Office Visit at One of 44 Participating Clinics

| Service | Up-to-Date at Beginning of Visit,* Mean (SD) | Offered Service If Not Up-to-Date, Mean (SD) |
|---------------------------|---|---|
| Check blood pressure | .81 (.05) | .88 (.09) |
| Cholesterol measurement | .65 (.08) | .07 (.05) |
| Asked if smokes† | NA | .55 (.14) |
| Advised to quit smoking† | NA | .48 (.14) |
| Breast examination | .66 (.06) | .15 (.11) |
| Mammogram | .60 (.09) | .24 (.11) |
| Papanicolaou testing | .75 (.06) | .29 (.13) |
| Influenza immunization | .62 (.07) | .26 (.16) |
| Pneumococcus immunization | .33 (.10) | .06 (.05) |

*Up-to-date for specific preventive services defined in Table 1.

†Smokers only. Up-to-date at visit is not applicable because the guideline is for asking or providing advice at every visit.

Note: Rates among age- and sex-eligible patients were weighted to age and sex distribution of the white population in the United States.

SD denotes standard deviation; NA, not applicable.

for individual clinicians also showed no overall patterns of relation between desire to improve and delivery rates. Moreover, none of the clinics the authors have worked with have ever measured either their rates of preventive services delivery or the functionality of the processes they use for accomplishing delivery. There is little evidence to indicate that clinicians currently have an accurate idea about how well they are doing in providing preventive health care services.

There are many reasons to suggest that attempting to change clinician attitudes is not the critical element in determining the success of strategies to

improve the delivery of clinical preventive services. The authors, however, believe this study provides the first solid evidence that there is little direct relation between allegedly important prevention attitudes and patient-reported delivery rates. This study also suggests that evidence from other fields can be applied to health care. For example, there have been extensive studies of this question in psychology, with the general conclusion that there is a weak and usually noncausative relation between attitudes and behavior in selective circumstances.³⁸⁻⁴¹ For cases in which there may be a causative relation, it is more likely that alterations in behavior and environment

TABLE 6

Correlation Between Attitude Scales and Prevention Rates Among 647 Physicians, Midlevel Practitioners, and Nurses in 44 Participating Clinics

| Preventive Service | Pearson Correlations (P Values) for | | | | | |
|------------------------|-------------------------------------|-------------------|--------------------------------|----------------------|--|-----------------------|
| | Scale 1 Desire to Improve | | Scale 2 Support for Systems | | Scale 3 Received Leadership Support | |
| | Up-to-date | Recommend If Need | Up-to-date | Recommend If Need | Up-to-date | Recommend If Need |
| Blood pressure | .13 (.4) | .24 (.1) | .09 (.5) | .18 (.2) | -.01 (.9) | -.07 (.6) |
| Cholesterol | -.46 (.002) | .008 (.9) | -.42 (.005) | -.32 (.03) | -.04 (.8) | .04 (.8) |
| Tobacco identification | NA | .07 (.6) | NA | .20 (.2) | NA | .34 (.022) |
| Tobacco quit advice | NA | .05 (.7) | NA | -.09 (.6) | NA | .33 (.028) |
| Breast examination | -.17 (.4) | -.04 (.8) | -.17 (.3) | -.03 (.9) | -.25 (.1) | -.27 (.08) |
| Mammogram | -.12 (.4) | .009 (.9) | -.17 (.3) | .21 (.2) | -.28 (.065) | -.21 (.2) |
| Papanicolaou smear | -.10 (.5) | .04 (.8) | -.35 (.018) | .13 (.4) | -.15 (.3) | -.18 (.2) |
| Influenza immunization | .12 (.4) | -.08 (.6) | .11 (.5) | -.02 (.9) | .09 (.6) | -.27 (.079) |
| Pneumonia immunization | -.06 (.7) | -.04 (.8) | -.23 (.14) | -.04 (.8) | .04 (.8) | -.12 (.4) |

NOTE: P values indicate the probability of a sample correlation of the observed magnitude, if the population correlation were zero. P values ranging from .05 to .10 are bold-faced, and P values <.05 are boxed. NA denotes not applicable.

lead to changes in attitudes rather than the other way around.

The findings in this report should be important to those trying to generate these behavior changes in clinical practice. Rather than attempting to educate or to use various techniques to change attitudes, the focus should be on altering the environmental barriers that interfere with providing preventive services. This appears to be best accomplished by building supportive office systems. The real challenge is for clinical leaders to learn how to develop, implement, and maintain these systems.

The main weakness in this study is that it was performed in a group of clinics that have a stronger-than-usual interest in preventive services. At least, such a selection bias might be inferred by the voluntary participation of clinics in this trial. Although the clinics and respondents in this study probably represent the innovator, early adopter, and early majority categories from Rogers' work on the diffusion of innovation,⁴² they also constitute 29% of the total separate clinics eligible to participate in this clinical trial and 50% of the eligible medical groups. They, therefore, may not be as far removed from average as their volunteer status might suggest. Their measured prevention rates and the considerable variation in rates from clinic to clinic and service to service also leaves ample room for improvement in the delivery of these services by these clinics.

Another potential weakness lies in the reliance on patient reports for the incidence of needing and receiving recommendations for preventive services. Recent studies suggest that patient reports tend to overestimate both the recency and the occurrence of medical actions.⁴³⁻⁴⁷ However, even if the rates are overestimated, it would not seem likely to confound the findings of this study. There is no reason to believe that overestimation would vary in a nonrandom way among the clinics; ie, it will generally inflate only the rates of up-to-date and recommended services but should not affect correlations between attitudes and rates.

Attitudinal reports from primary care nurses and the few midlevel practitioners in these clinics were added to those of physicians. This was done deliberately because the attitudes of all health care professionals contribute to the likelihood that preventive services will be carried out, especially as clinics adopt systems approaches and delegate many pre-

ventive tasks to their nonphysician clinic staff. Fortunately, the attitudes of nurses and physicians are completely congruent in scale 2 regarding support for the office systems that may be the major determinant of service rates. Where they differ, nurses are only slightly less likely to want to improve preventive services and slightly less likely to believe that clinic leadership (ie, physicians in most clinics) is committed to that improvement.

The attitudes reported by clinicians and nurses may be different from their real attitudes. Today's environment does not support questioning attitudes about prevention, so there may have been a tendency to report answers that were perceived by the respondents as more acceptable. Moreover, practice constraints limit the ability to accomplish everything that is desired. Neither of these potential confounders, however, seems likely to mask any potential relation between attitudes and behavior to the extent demonstrated by this study.

Does this mean that favorable attitudes are not important to improving clinical preventive services? This is unlikely, since attitudes are probably important predisposing factors. While recognizing that they are not mutually independent, Green and colleagues⁴⁸ have grouped the types of influence on behavior into three categories: (1) *predisposing*—knowledge, attitudes, beliefs, values, and perceptions; (2) *enabling*—skills, reimbursement, time, and office systems; and (3) *reinforcing*—visible results, colleague support, and feedback.

Robert Lawrence, chair of the first USPSTF, added to the enabling factors the need for "a coherent set of guidelines that are perceived as scientific and unambiguous."⁴⁹ He also used this concept as a way to analyze and address aids and barriers to the diffusion of preventive services recommendations.

These results appear to confirm the ideas of Green et al⁴⁸ and Lawrence,⁴⁹ which emphasize the importance of going beyond predisposing factors to adoption of strategies that strengthen the enabling and reinforcing factors. These ideas strongly suggest a focus on the office systems that so many are now identifying as the critical entry and leverage point for substantial improvements.^{13-15,20-29} These results also indicate that the frequent suggestions and efforts to improve preventive services by providing educational or attitudinal interventions are unlikely to be effective unless combined with other strategies. These

educational intervention strategies suggest that if clinicians had the right attitudes, they could accomplish goals obstructed by their current practice environments.¹⁶

Another valuable framework for conceptualizing the relation between attitudes and behavior change emerged from the work of Prochaska and DiClemente⁵⁰⁻⁵² on the transtheoretical model of readiness for change based on clearly defined stages. This theory suggests that people's attitudes are important in governing their readiness to make behavior changes or even to listen to advice or suggestions about those changes. The importance of readiness attitudes is primarily in shaping the way one approaches these individuals. There is little reason to believe that changing an attitude stage alone is capable of bringing about changes in behavior, particularly if the behavior change requires skills or a supportive environment.

Although the transtheoretical model was developed around patient health promotion behaviors, Prochaska and Goldstein,⁵³ Cohen et al,¹⁴ and others⁵⁴ have suggested that change-stage concepts could just as easily be usefully applied to physicians. Educational approaches and other interventions targeting current attitudes might be useful in moving physicians along the change continuum from the precontemplation stage to the preparation stage. Just as with smokers preparing to quit, the only truly important behavior index is whether they actually quit smoking, ie, make the behavior change. Since good intentions do not seem to be correlated with the actual behavior of providing preventive services in this study or in the literature, something more is clearly needed.

The findings in this report provide support for the hypothesis that the critical need is to focus primarily on providing clinic leaders with more effective tools for planned organization change rather than focus on changing attitudes, which are already mostly favorable. More effective tools would include an understanding of processes and process improvement and a reliance on data, rather than hunches or attitude adjustments, as a basis for decisions. Continuous quality improvement is a conceptual package that contains these tools.⁵⁵ When CQI is combined with the concept of prevention as a single system with many processes,³³ clinicians may be better equipped to help to meet the goals of *Healthy People 2000*.¹

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