Effects of a Physician Communication Intervention on Patient Care Outcomes

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OBJECTIVE: **To determine whether an intervention designed to improve patient-physician communication increases the frequency with which physicians elicit patients' concerns, changes other communication behaviors, and improves health care outcomes.**

DESIGN: **Pretest-posttest design with random assignment of physicians to intervention or control groups.**

SETTING: **General medicine clinics of a university-affiliated Veterans Affairs Hospital.**

PATIENTS/PARTICIPANTS: **Forty-two physicians and 348 continuity care patients taking prescription medications for chronic medical conditions.**

INTERVENTIONS: **Intervention group physicians received 4.5 hours of training on eliciting and responding to patients' concerns and requests, and their patients filled out the Patient Requests for Services Questionnaire prior to a subsequent clinic visit. Control group physicians received 4.5 hours of training in medical decision-making.**

MEASUREMENTS AND MAIN RESULTS: **The frequency with which physicians elicited all of a patient's concerns increased in the intervention group as compared with the control group ($p = .032$). Patients perceptions of the amount of information received from the physician did increase significantly ($p < .05$), but the actual magnitude of change was small. A measure of patient satisfaction with the physicians was high at baseline and also showed no significant change after the intervention. Likewise, the intervention was not associated with changes in patient compliance with medications or appointments, nor were there any effects on outpatient utilization.**

CONCLUSIONS: **A low-intensity intervention changed physician behavior but had no effect on patient outcomes such as satisfaction, compliance, or utilization. Interventions may need to focus on physicians and patients to have the greatest effect.**

KEY WORDS: **doctor-patient communication; patient satisfaction; ambulatory care.**
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Communication between physicians and patients is fundamental to medical care. Effective communication facilitates decision-making and improves patient understanding, satisfaction, and cooperation. Patients and providers often differ in their expectations about the nature of health problems and expected outcomes.[1–12] These disagreements have a negative effect on patient satisfaction,[6] compliance,[13] symptoms,[11] and resolution of problems.[1, 12, 14] Moreover, providers often lack adequate interviewing skills, underestimate the amount of information patients want,[12, 15] have difficulty detecting and resolving compliance problems,[16] and do not elicit and discuss patient perceptions.[17–19] Patients are often reluctant to request information or express their opinions and desires regarding care. Poor health care outcomes may result from this reluctance, as well as from providers' failure to elicit and provide information in a way that will produce desired changes in patient attitudes and behavior.

Interventions to increase patients' involvement in decision-making have been shown to alter their communication with providers and have resulted in better patient satisfaction with care, compliance, and health outcomes.[20–31] However, patient education programs are difficult to conduct, and the effects of single interventions decay over time.[32] Furthermore, patients' beliefs and perceptions develop and change as a result of experiences with the disease and treatment.[17, 33, 34]

Improving physicians' interaction skills may be a more efficient use of resources than multiple patient interventions. A number of experimental studies have demonstrated that educational interventions can improve interviewing skills and communication behavior in physicians, residents, and medical students.[13, 35–49] Although fewer studies have examined the effect of such interventions on patient care outcomes,[13, 37, 50–54] most studies have demonstrated improvements in a variety of health care outcomes such as patient satisfaction, retention of information, medication and appointment compliance, blood pressure control, and attempts to quit smoking.

A number of problems with the previous studies limit

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their applicability to clinical practice. First, although several experimental studies have shown that physician tutorials can change communication behavior or enhance patient care outcomes, very few studies have measured the effect of educational interventions on both physician behavior *and* patient care outcomes.[13, 51, 52] In addition, only one or two potential patient outcomes was examined in any one study, and sample sizes have been small. The interventions have tended to require a heavy commitment of instructor or trainee time, which makes them expensive to conduct and hinders program implementation. Thus, while there is ample evidence that physician communication skills are related to patient outcomes,[55–57] and that these skills can be learned by physicians, the efficacy of a practical intervention that can be implemented readily in outpatient settings to improve patient-physician interaction and enhance patient care outcomes has not been adequately studied.

The purpose of the study described here was to implement and evaluate a practical intervention in an outpatient setting. The intervention was designed to facilitate physicians' awareness of patients' concerns and was derived from the literature showing that recognition and fulfillment of patients' requests for care are related to patient satisfaction, compliance, and health status.[58–61] It consisted of two parts: (1) the use of a short questionnaire on which patients could express to physicians their desires for assistance, and (2) a brief physician educational program on how to use the information on the questionnaire and elicit, negotiate, and resolve patient concerns. The specific objectives of this study were to determine whether this intervention designed to enhance patient-physician communication would (1) increase the frequency with which physicians elicit patients' concerns; (2) enhance other aspects of the process of patient-physician communication; and (3) improve health care outcomes such as patients' satisfaction with care and compliance with medications and appointments

METHODS

Setting and Subjects

The study was conducted in an urban, university-based Veterans Affairs hospital using a pretest-posttest design with random assignment of physicians to an intervention or control group. All physician subjects were staff physicians or internal medicine residents who had been seeing patients in continuity care general medicine clinics for more than 12 months.

Study patients were identified from the clinic panels of each study physician. Patients were potentially eligible if they had attended an appointment with their physician sometime in the last 9 months, had another appointment scheduled during the baseline (preintervention) data collection period, and were taking oral medication for at least one chronic condition. Patients were contacted until at least eight patients were enrolled for each study physician. Written informed consent was obtained at the baseline visit; data were collected at the baseline visit and at a postintervention visit 2 to 12 months later.

Intervention

Educational Program for Physicians

Physicians in the intervention group received an educational program designed to enhance their ability to elicit, identify, and respond effectively to patient requests. The teaching methods included readings, lecture, discussion, review of videotapes, and role-playing. The educational program was conducted in three 90-minute sessions held at the beginning of regularly scheduled general medicine clinics. No patient appointments were scheduled during the sessions. The sessions were conducted at two-week intervals so that physicians could practice using the clinical tool (Patient Requests for Services Questionnaire, described below) in clinics during the alternate weeks. Outlines and two or three focused readings were prepared for each session. The first session dealt with the importance of identifying and eliciting the patient's agenda, negotiating a realistic, consensual agenda for the visit, identifying patients' attributions and expectations, relationship-building skills, and using the clinical tool. The patient questionnaire/clinical tool was presented to physicians as a way to assist them in ascertaining patients' concerns. It was attached to the patient chart, and physicians were encouraged to review it before seeing the patient. Although it was left to the physician to decide whether to make any direct reference to the questionnaire in the patient's presence, the desirability of eliciting all patient concerns early in the visit was emphasized. The second session reviewed the physicians' experience with the clinical tool during the previous week and focused on how to help patients follow recommendations. The third session was devoted to practice and feedback of skills using simulated patients who role-played four different scenarios.

Physicians in the control group received three 90-minute seminar teaching sessions on medical decision-making. In an interactive format, participants discussed probability estimation, principles of diagnostic tests, and Bayesian probability revisions.

Patient Requests for Services Questionnaire

Before they saw their doctor, patients of physicians in the intervention group filled out a 16-item Patient Requests for Services Questionnaire,[60] and the form was attached to the front of the patient's medical chart. The questionnaire elicited information about what particular services or assistance patients would like to receive. The types of services patients could request on the form included information about their disease conditions and treatment; counseling regarding habit and behavior change;

discussion of their concerns with the doctor; assistance with emotional and social problems; and tests and referral to specialists.

The rationale for this clinical tool was that physicians, although they may recognize their own difficulty in eliciting and responding to patients' concerns, lack a method for focusing on patients' priorities in a busy clinic where time to interact with each patient is limited. The questionnaire was conceived as a clinical tool to enhance information transfer between patient and physician. The completed questionnaire was attached to the front of the medical chart so that the physician could review it before seeing the patient. After the visit, patients filled out a corresponding form, the Patient Services Received Questionnaire, on which they indicated whether they had received any of the 16 services at that visit. Patients in the control group filled out the Patient Requests for Services and the Patient Services Received questionnaires after their visit; their physicians did not see the form.

Measures

Physician and Patient Baseline Characteristics

A variety of measures of factors that may influence patient-physician interaction were made to assess whether the physicians randomized to intervention and control groups were similar. Information about physicians' job satisfaction and attitudes toward patient care were obtained before beginning baseline data collection. An eight-item scale was used to measure physicians' satisfaction with organizational characteristics of the work setting in teaching hospital group practices.[62, 63] Job satisfaction scores were computed by averaging responses over all items and could range from 1 (very dissatisfied) to 5 (extremely satisfied). Attitudes toward patient care were assessed using four subscales (medical empathy, 12 items; effective interaction, 13 items; non-verbal expressiveness, 5 items; courtesy/respect, 3 items) from Linn's Humanistic Attitudes and Behaviors Scale.[64] Responses to each item were scored from 1 (strongly disagree) to 5 (strongly agree). Scores were computed by summing responses within the subscale, with higher scores indicating higher self-reported humanistic behavior.

Patients were also examined with regard to comparability on factors that may affect patient-physician interaction. Patient desires for information and participation in care were assessed at the baseline clinic visit using the Krantz Health Opinion Survey (KHOS).[65] Two subscales assess desire for information (seven items) and behavioral involvement (nine items) using a binary yes/no response format. Scores can range from 1 to 7 on the former scale and from 1 to 9 on the latter. Patients' education (eighth grade or less, some high school, high school graduate, some college, college graduate, any postgraduate work) and self-rated health status (1 = very poor; 5 = excellent) also were obtained by questionnaire. All patient and physician questionnaires have acceptable reliability and validity.

Patient-Physician Encounters

Audio-tapes of clinic visits were obtained before and after the intervention by data collectors who placed tape recorders in the examining rooms and turned them on at the beginning and off at the end of each visit. The Roter coding system[23] was used to classify the content of the verbal exchanges between physicians and patients. The coding scheme counts the frequency of 40 categories of utterances, which were also collapsed into broader categories. Eight audiotape coders received approximately 50 hours of initial training. Ten percent of tapes were coded by more than one coder and reviewed to maintain quality and consistency throughout the coding period. Interrater agreement was high; the intraclass correlation coefficient[66] was .90 or greater for all aggregate and most individual utterance coding categories.

To assess the implementation of intervention strategies, audiotape coders noted whether physicians in the intervention group made any direct references to the Request for Services Questionnaire attached to the chart and, if so, approximately when these references occurred in the visit (beginning, middle, or end). In addition, the coders recorded whether or not physicians elicited all of the patient's concerns. If the physician continued to probe for the patient's concerns ("Anything else?") until the patient indicated there were no more concerns, the visit was coded as "All concerns were elicited." Examples of questions to elicit patient's concerns were: "How have you been doing?" "How are you?" "What can I do for you today?". Interrater agreement on the coding of elicitation of patient concerns was very high ($\kappa = 0.93$).

Patient Care Outcomes

The outcomes of patient care included patients' perceptions regarding the amount of information they received, satisfaction with their physician, medication compliance, and appointment keeping. Patients' perceptions of the amount of information they received from their physician about their disease conditions and amount of information they received about medications were assessed using single questions with five-point response scales (1 = nothing at all; 5 = all there is to know). The 26-item American Board of Internal Medicine Patient Satisfaction Questionnaire[67] was used to assess the patient's perception of the physician's personal manner, communication skills, and technical competence. The satisfaction scores were calculated by averaging the ratings over all items and could range from 1 (poor) to 5 (excellent). These measures were obtained via a brief questionnaire completed by the patient immediately after the baseline and postintervention clinic visits.

A combination of approaches to assess compliance has been recommended to increase the proportion of subjects who are correctly identified as noncompliant.[68] Two

methods were used to assess compliance with medications for chronic conditions in this study: an objective technique based on computerized pharmacy records of medication prescriptions and refills, and a patient interview to ascertain self-reported frequency and pattern of medication-taking. Computerized pharmacy records were used to determine the amount of medication prescribed (what the patient should have received) and the amount dispensed (what the patient actually had filled) in the year before the postintervention visit and in the year after.[69] The compliance score was computed by dividing the amount dispensed by the amount prescribed. Whether patients obtained their medications from other sources was ascertained in the interview. While this method may overestimate actual medication-taking, it does provide an upper limit of actual compliance.

Self-reported medication compliance during three-month periods following baseline and postintervention clinic visits was assessed by telephone interview using questions drawn from three sources: a "nonjudgmental compliance question,"[70] a four-item questionnaire on adherence,[71] and a four-item compliance interview.[34] Responses indicating that medications had been missed were followed up with more detailed questions about how many doses had been missed and whether changes in the regimen had been discussed with the doctor. Patients who could not be contacted by telephone were mailed a questionnaire. Patients were classified as noncompliant if they obtained less than 100% of their prescribed refills or they reported that they usually missed two or more doses of medication per week and had not discussed these regimen changes with the doctor.

The number of appointments scheduled and the number of appointments for which patients failed to report without calling to cancel or reschedule ("no show") were obtained from the computerized appointment files for the general medicine clinic and all outpatient clinics in the one-year intervals before and after the postintervention visit.

Data Analyses

Physicians were the unit of analysis for all tests of the effects of the intervention. Two approaches were considered to analyze the effect of treatment group on the dichotomous outcome of elicitation of patient concerns and account for clustering of patients within physicians: a generalized estimating equations (GEE) approach and a general linear model analysis of variance. The GEE approach is an extension of logistic regression that adjusts for the effect of clustering and permits the use of covariates.[72] However, because it tends to be unreliable in samples in which there are fewer than 40 clusters (physicians) per treatment group,[73] we did not use it. Rather we chose to use the general linear model for the special case of the zero–one dependent variable of elicitation of all patient concerns,[74] which also allowed us to account for clustering and include a covariate. The model included terms for treatment effect, physician effect (physicians nested within treatment group), and a covariate consisting of preintervention values of elicitation of concerns. General linear model analysis of variance with terms for treatment effects, physician effects, and preintervention values was used also in the analyses of patient outcome variables. Conservative F values for all treatment effects were computed using the mean-square from the physician effect term (degrees of freedom = 40), rather than the error term, in the denominator. SPSS and SYSTAT statistical software were used for the data analyses.[75, 76]

RESULTS

Study Subject Participation and Attrition

Physicians

Of 44 eligible physicians, 43 agreed to participate and provided written consent; however, one staff physician left the VA before the postintervention data were collected. Thus, 42 physicians (22 intervention, 20 control) completed the study.

Patients

Letters with cards were sent to 1,829 potentially eligible patients, and cards were returned by 859 (47%). Contact was attempted with 761 patients who indicated interest or did not return a card. Of these, we were unable to contact 102 (13.4%), 117 refused (15.4%), and 542 (71.2%) agreed to participate. Of the 542 patients, 409 (75.5%) gave written consent and completed baseline data collection. The majority (79%) of the patients who agreed to participate but for whom data were not collected were not needed because the quota for their physician had been filled. The remainder either failed to report for or canceled their appointment, or no data collector was available at the time of their appointment. Of the 409 patients who completed baseline data collection, 9 were patients of the physician who left the VA before postintervention data were collected and were not included in the analyses.

Two hundred nine patients of the 22 intervention group physicians, and 191 patients of the 20 control group physicians completed baseline data collection. Of these, 348 attended postintervention clinic visits (185 intervention, 163 control). Of the 52 patients lost to follow-up, 23% died, 15% refused to participate, 23% had no clinic visit scheduled within the postintervention follow-up period, and 31% changed physicians before the end of the follow-up period (primarily because their third-year resident physicians were finishing residency). Three hundred and eight patients had complete audiotape data at both baseline and postintervention visits. Attrition was similar among patients of physicians in both treatment groups. Complete questionnaire and tape data at baseline and postintervention were obtained from 161 (77%) of 209 patients of intervention group physicians and from 146

(76%) of 191 patients of control group physicians. Follow-up data on pharmacy and outpatient utilization for one year after the postintervention visit were obtained from 325 patients, 175 (84%) of 209 in the intervention group and 150 (79%) of 191 in the control group. Self-reported compliance data were obtained from 386 (97%) of 400 patients at baseline and 317 (91%) of 347 patients postintervention. For 310 patients, 167 (80%) of 209 in the intervention group and 143 (75%) of 191 in the control group, self-report and pharmacy medication compliance information at both baseline and postintervention were available.

Baseline Characteristics of Study Subjects

The characteristics of physicians assigned to the intervention and control groups and their patients are summarized in Table 1. There were no differences at baseline between physicians assigned to intervention and control groups on the measures of job satisfaction or attitudes toward patient care. There also were no baseline differences in their patients' demographic or health characteristics, or attitudes about participation in care. Patients who were lost to follow-up also did not differ significantly from patients who completed postintervention visits with respect to these variables.

Effect of the Intervention on Physician and Patient Behaviors

Implementation of the Intervention by Physicians

For each physician, the proportion of visits in which he or she elicited all of the patient's concerns was calculated before and after the intervention. The mean proportion of visits in which all concerns were elicited increased from 35% to 60% in the intervention group and decreased from 52% to 44% in the control group (Table 2). The difference between treatment groups in postintervention mean scores on elicitation of concerns, controlling for physician effects and preintervention values, was statistically significant ($F_{(1,40)} = 5.013$, $p = .032$).

Of 22 physicians in the intervention group, 17 made overt references to the requests questionnaire in at least one postintervention patient visit (mean = 40% of visits). However, physicians usually used the questionnaire to bring the history segment or the visit to a close, rather than as a tool to aid in eliciting all of the patient's concerns at the outset of the visit. Only 22% of physicians' references to the questionnaire were made at the beginning of the visit, whereas 45% of references occurred exclusively at the end of the visit. Likewise, when physicians elicited all patient concerns, they usually did not do so at the beginning of the visit.

Utterance Counts

There was no effect of the intervention on the frequency of any category of doctor or patient utterances, including total number of utterances.

Table 1. Comparison of the Baseline Characteristics of Physicians and Patients

	Intervention	Control
Physician Characteristics	(*n* = 22)	(*n* = 20)
Training level		
Staff	8 (36%)	6 (30%)
Third-year resident	8 (36%)	6 (30%)
Second-year resident	6 (27%)	8 (40%)
Gender		
Male	12 (55%)	14 (70%)
Female	10 (45%)	6 (30%)
Job satisfaction score (mean ± SD)	3.00 ± 0.78	3.2 ± 0.59
Humanistic attitudes (mean ± SD)		
Courtesy/respect	11.68 ± 1.2	11.95 ± 1.0
Effective interaction	43.41 ± 4.1	41.15 ± 4.2
Medical empathy	41.41 ± 4.1	42.45 ± 3.4
Nonverbal effectiveness	19.20 ± 2.1	18.85 ± 1.5
Patient Characteristics	(*n* = 185)	(*n* = 163)
Age (mean ± SD)	61.84 ± 3.6	62.84 ± 3.2
Male gender (%)	92	94
Education		
High school graduates (%)	23	20
Some college (%)	45	36
College graduates (%)	11	17
Self-rated health status		
Very poor or poor (%)	47	46
Fair (%)	34	35
Good or excellent (%)	19	19
Self-rated bother or discomfort from conditions		
None, very little (%)	23	24
Some (%)	32	28
Fair amount (%)	25	29
Great deal (%)	20	19
KHOS–information seeking (mean ± SD)	3.36 ± 0.79	3.21 ± 0.75
KHOS–behavioral involvement (mean ± SD)	2.21 ± 0.63	2.04 ± 0.90

Effects of the Intervention on Patient Care Outcomes

Patients' Perceptions

After their baseline and postintervention visits, patients were asked how much information their physician had given them about their health status and the causes of their disease conditions, as well as how much information they had been given regarding their medications and possible side effects. On average, at baseline physicians in both groups were rated as giving their patients "quite a lot" of information or "all there is to know" about their disease conditions and medications. After the intervention, the ratings of amount of information given by control group physicians declined, while intervention group physicians' ratings increased slightly (Table 2). The postinter-

Table 2. Comparison of Outcome Measures in Intervention and Control Group Physicians Before and After the Intervention

Outcome measure	Intervention (n = 22)	Control (n = 20)	p Value
Mean proportion of visits in which all concerns were elicited			
Before	0.35 (0.24)	0.52 (0.21)	
After	0.61 (0.27)	0.44 (0.17)	.032
Patient perception of amount of information given by physician about medications and side effects			
Before	3.86 (0.26)	3.89 (0.31)	
After	3.91 (0.29)	3.75 (0.27)	.058
Patient perception of amount of information given by physician about disease conditions			
Before	3.93 (0.23)	3.92 (0.27)	
After	3.96 (0.38)	3.79 (0.34)	.040
Patient satisfaction			
Before	4.40 (0.23)	4.37 (0.19)	
After	4.44 (0.22)	4.36 (0.22)	>.20
Mean proportion of patients compliant with medications			
Before	56.8 (15.3)	58.1 (17.9)	
After	54.1 (17.9)	56.8 (22.7)	>.20
Mean proportion of patients who did not report for ≥1 clinic visit			
Before	0.21 (0.14)	0.16 (0.18)	
After	0.14 (0.15)	0.09 (0.10)	>.20

Values are means with standard deviations in parentheses.

vention differences were statistically significant for perceptions about amount of information received regarding disease conditions ($F_{(1,40)} = 4.30$, $p = .04$), and for medications and side effects ($F_{(1,40)} = 3.61$, $p = .058$).

Patient Satisfaction

In general, satisfaction scores were high; the majority of patients rated their physicians' skills in most areas as "very good" or "excellent." Satisfaction scores did not change significantly after the intervention (Table 2) in either the intervention or control group ($F_{(1,40)} = 1.40$, $p = .24$).

Medication and Appointment Compliance

The mean proportion of patients who were compliant with their medications did not differ between intervention and control group physicians before or after the intervention. Likewise, the proportion of patients who failed to report for one or more scheduled general medicine clinic visits in the one-year intervals before and after the intervention did not differ by treatment group (Table 2).

Effects of the Intervention and Physician Gender

We did analyses to examine whether physician gender had any independent or interactive effects. Separate tables constructed for male and female physicians showed the effects of the intervention were very similar in both groups, and analyses of variance showed no significant main effect of physician gender. There also was no significant gender–treatment group interaction. We did not have sufficient numbers in all subgroups to examine a gender-training interaction.

DISCUSSION

Using an intervention of relatively low intensity we were able to change physician behavior. After the intervention, the frequency with which physicians elicited all of a patient's concerns increased significantly in the intervention group. This change apparently was accomplished without an increase in the length of the visit. Although we did not directly time the visits, there was no increase in total verbal utterance counts as a result of the intervention.

Although the intervention increased the frequency with which all patient concerns were elicited, many physicians waited until the end of the visit to determine whether all concerns or questions had been addressed. It has been suggested that it may be more efficient and effective to conduct this activity earlier in the visit.[77, 78] Further development of the educational approach should include a greater focus on how to elicit concerns earlier in the visit.

The intervention had no substantive effects on patient outcomes. Patients' perceptions of the amount of information given by their physician about medications and disease conditions differed significantly between treatment groups after the intervention; however, the actual magnitude of effect was small. Likewise, the effects of the intervention did not generalize to the broad range of verbal behaviors that are measured by the Roter coding

scheme, perhaps because of the focused and specific nature of the intervention. Nor was there any effect on patient satisfaction or medication and appointment compliance. The measures of patients' perceptions of the amount of information given by their physician were single items that may have low reliability and sensitivity to treatment effects. The satisfaction measure had very low variability and, as has been observed in other studies, the majority of patients at baseline reported high levels of satisfaction and rated most of their physicians' skills as "very good" or "excellent." Furthermore, the satisfaction score reflects many dimensions of physician behavior, which may also make it less sensitive to the effects of the intervention. Although we expected that medication and appointment compliance would improve, these measures also had low variability; most patients in both groups were compliant with medications and appointments. Moreover, these are secondary outcomes that probably are mediated by changes in attitudes and satisfaction.

The low variability of the satisfaction and compliance outcome measures may have been due to the voluntary nature of patient participation. Spontaneous comments from patients indicated that those who refused to participate were more often unhappy with their medical care than were patients who chose to participate. In addition, some of the factors by which patients were included in the final analyses of the effect of the intervention (e.g., at least one visit in the nine months prior to enrollment and attended both preintervention and postintervention visits) would tend to exclude patients who miss appointments.

Our findings suggest that strategies to enhance patient-physician communication and improve patient care outcomes warrant further experience and application. The positive effects on physician behavior occurred after only 4.5 hours of training. Although we found no effect on patient outcomes, one might achieve a greater effect if the educational intervention and request questionnaire were an ongoing part of clinic procedures, conducted over the course of multiple visits with all patients. Other studies that have evaluated interventions designed to change patient communication behaviors have shown effects on outcomes such as medication compliance and satisfaction.[22, 23, 25, 29-31] It may be that these other interventions, because they involve patients more directly, have greater potential to affect such outcomes. To create the greatest improvement in medical care in the primary care setting, interventions may need to be directed to both physicians and patients.

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