Physician Education and Report Cards: Do They Make the Grade? Results from a Randomized Controlled Trial

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PURPOSE: We sought to determine whether tailored educational interventions can improve the quality of care, as measured by the provision of preventive care services recommended by the US Preventive Services Task Force, as well as lead to better patient satisfaction.

SUBJECT AND METHODS: We performed a randomized controlled study among 41 primary care physicians who cared for 1,810 randomly selected patients aged 65 to 75 years old at Kaiser Permanente Woodland Hills, a group-model health maintenance organization in southern California. All physicians received ongoing education. Physicians randomly assigned to the comprehensive intervention group also received peer-comparison feedback and academic detailing. Baseline and postintervention (2 to 2.5 years later) surveys examining the provision of preventive care and patient satisfaction were performed and medical records were reviewed.

RESULTS: Based on the results of patient surveys, there were significant improvements over time in the provision of preventive care in both the education and the comprehensive intervention groups for influenza immunization (79% versus 89%, \( P < 0.01 \), and 80% versus 91%, \( P < 0.01 \)), pneumococcal immunization (42% versus 73%, \( P < 0.01 \) and 34% versus 73%, \( P < 0.01 \)), and tetanus immunization (64% versus 72%, \( P < 0.01 \), and 59% versus 79%, \( P < 0.01 \)). Mammography (90% versus 80%, \( P < 0.01 \) and clinical breast examination (85% versus 79%, \( P < 0.05 \)) scores worsened in the education only group but not in the comprehensive intervention group. However, there were few differences in rates of preventive services between the groups at the end of the study, and the improvements in preventive care were not confirmed by medical record review. Patient satisfaction scores improved significantly in the comprehensive intervention group (by 0.06 points on a 1 to 5 scale, \( P = 0.02 \) but not in the education only group (by 0.02 points, \( P = 0.42 \)); however, the improvement was not significantly greater in the comprehensive intervention group (\( P = 0.20 \)).


Despite the widespread interest in the measurement of quality of care and patient satisfaction, the question of how to increase patient satisfaction and improve the provision of care, including preventive care, remains largely unanswered. Many previous studies have focused on changing practitioner behavior using methods such as provider education, retrospective feedback, concurrent feedback, incentives, “opinion leaders,” patient education, and computerized clinical decision support. Two effective strategies for changing physician behavior are peer-comparison feedback and academic detailing (1,2). Peer-comparison feedback involves the provision of data that compare the performance of a physician with that of selected peers (2). Academic detailing involves intensive one-on-one educational interactions with other health care providers with the intervention directed toward specific clinical decisions, such as the use of immunizations (1).

The goal of this study was to determine the effect of physician education, academic detailing, and peer-comparison feedback on quality of care, as measured by compliance with preventive care practice guidelines and patient satisfaction. Physicians were randomly assigned to an education only group or a comprehensive intervention group. Patient satisfaction and patient and medical record reports of physician compliance with preventive care guidelines were measured (3).

METHODS

Setting and Subjects

The study was performed at Kaiser Permanente Woodland Hills, a group-model health maintenance organization located in the San Fernando Valley in southern Cal-
ifornia. Before the study, all primary care physicians met as a group and agreed to participate. Those who had practiced with the medical group for at least 2 years were enrolled. They included internists, family practitioners, and subspecialists who devoted a substantial portion of their time to primary care and were considered the primary care providers for at least 60 patients.

Because the prevalences of most diseases are greatest in the elderly and poor health care may be more likely to cause poor outcomes in these patients, only patients aged 65 to 75 years were included in the study. Of the approximately 100,000 adult patients enrolled in the Southern California Permanente Medical Group (Woodland Hills at the time), there were 9,233 patients aged 65 to 75 years who were potentially eligible for inclusion. Surveys were mailed to 3,249 randomly selected patients; 2,237 patients completed both the baseline and postintervention surveys. Of these, 299 patients were not included in the analysis because their physicians were not part of the study (eg, physician left the medical group); 128 of the remaining patients and 7 physicians (see below) were also excluded. The final analysis was based on 1,810 patients. Each of the remaining 41 physicians cared for a minimum of 25 and a maximum of 56 study patients (mean of 44 patients). Patients were blinded to whether their physician was in the comprehensive intervention or education only group.

Data Acquisition
Patients were surveyed by mail from January 1992 to April 1992; those who failed to respond were mailed a second copy. From April to May 1992, patients who still had not responded were contacted by telephone. An identical survey was sent to patients from January to November 1995, using the same methods. Follow-up telephone calls for the second survey were made from December 1995 to January 1996.

The survey included questions about preventive care services to determine whether seven preventive care services had been offered or performed during recommended time intervals (3). These services included annual influenza immunization, mammography, clinical breast examination, tetanus immunization within the past 10 years, pneumococcal immunization during their lifetime, smoking cessation counseling, and exercise counseling (3). All preventive services were available free of charge or at a nominal charge to members of the medical group. In addition, a 14-item questionnaire adapted from the RAND Health Insurance Experiment assessed patient satisfaction (4). To compare patient survey responses with evidence in the medical record documenting receipt of preventive care services, patient medical records were abstracted for all surveyed patients. To ensure the reliability of medical record review, only procedures that were prescribed at least every other year were abstracted, including influenza immunization, mammography, and clinical breast examination. Medical record review was performed by 4 trained personnel using standardized instruction forms, and interrater reliability of 100% was confirmed by an independent abstractor from the Kaiser Permanente Woodland Hills Ambulatory Quality Assurance Department. Reviews were performed from November 1991 to February 1992 and again from March 1994 to June 1994 after the intervention ended.

Intervention
Physicians were randomly assigned to either the education only or comprehensive intervention groups. Throughout the intervention period, all 48 physicians were mailed educational materials that contained one-page overviews of recommended preventive care services. The education participants (n = 24) received only this form of intervention. In addition to educational reminders, physicians in the comprehensive intervention group (n = 24) received peer-comparison feedback and academic detailing (1) from a pharmacist at the beginning of the study and 6 and 12 months later. The pharmacist provided the physicians with face-to-face education about up-to-date recommendations for preventive care services in several sessions of about 15 minutes in duration. Only the pharmacist knew which physicians were in the comprehensive intervention group. Peer-comparison feedback was composed of results from patient surveys and medical record review for preventive care procedures about physician compliance with guidelines and patient satisfaction. Data were presented confidentially in the form of bar graphs that showed the physician’s score for each category in relation to the scores of the physician’s peers. Only the score of the physician being counseled was identified during the session. Seven physicians (4 in the education group, 3 in the comprehensive intervention group) left the study because of death, retirement, or change in practice.

Statistical Analysis
All analyses were performed using the SAS (5) and the BMDP programs (6). Unless otherwise noted, statistical significance was set at 0.05 (two-sided). Continuous data are reported as means ± SD.

Changes between the first and second surveys were evaluated by computing the change for each respondent. A mixed model analysis of variance, in which patients were nested within physicians, was used; only those patients who responded to a particular item on both surveys were included in the analyses. Analyses were performed within each group (education only and comprehensive intervention) to assess changes between the surveys, as well as between the two groups.

Three questions addressed patient satisfaction with the quality of their physician’s performance. Responses were
based on a 5-point Likert-type scale, 1 denoting “strongly agree” and 5 “strongly disagree.” Scores were reversed as necessary so that 1 indicated poor satisfaction and 5 indicated an optimal level of satisfaction. Changes between surveys for these scores were analyzed using mixed model analyses of variance as described above.

Comparisons of the means of the combined satisfaction score between patients, based on whether they had reported that a specific preventive care service had been offered, were made using the two-sample t test, ignoring clustering within physicians.

## RESULTS

Of the 1,810 patients in the study, there were 905 patients (405 [45%] men) in the education only group and 905 patients in the comprehensive group (449 [50%] men, \( P = 0.04 \)). The mean age in both groups was 73 ± 3 years.

There were no significant differences in the age (46 ± 9 years in the education group; 42 ± 5 years in the comprehensive intervention group) or gender (17 [85%] men in the education group; 18 [86%] men in the comprehensive intervention group) of the two groups of physicians. The median length of time physicians had been employed by Kaiser Permanente was 10 years (range 4 to 32).

### Preventive Care Survey

The proportions of patients reporting that their physician offered the specific service increased significantly between surveys in both the education only and comprehensive intervention groups for influenza immunization, pneumococcal immunization, and tetanus immunization (Table 1). For mammography and clinical breast examination, the change in the comprehensive intervention group was not statistically significant, and the proportion actually decreased in the education only group. There was no significant improvement in smoking cessation counseling, and exercise counseling improved only in the comprehensive intervention group. When compared with patients whose physicians were in the education only group, those in the comprehensive intervention group reported greater improvements in the use of pneumococcal and tetanus vaccines (Table 1). In addition, the decline in use of mammography that was reported by the education only group was not reported by the comprehensive group. There were no other between-group differences.

### Medical Record Review

Patient recall of influenza immunization, mammography, and clinical breast examination did not match results ascertained from their medical records (Table 2). There were disagreements 20% to 40% of the time, usually when the medical record did not support the patient’s statement that a procedure was offered or performed.

Medical record reviews did not demonstrate increases in the proportion of patients to whom a procedure was offered. The percentage of patients offered influenza immunization changed only slightly from the first to the second review (54% to 55% education only; 59% to 63% comprehensive intervention). There were marked declines in the percentage of patients offered mammography (80% to 63% education only; 83% to 70% comprehensive intervention) and clinical breast examination (69% to 62% education only; 71% to 65% comprehensive intervention) in both groups.

### Patient Satisfaction

Satisfaction with care in both the comprehensive intervention group and the education only group was generally good, with a mean score exceeding 4.0 (on a 1 to 5 scale). The change in patient satisfaction between surveys

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**Table 1. Patient Recall Whether a Preventive Care Service Was Offered, by Whether the Physician Was in the Education Only Group or the Comprehensive Intervention Group**

<table>
<thead>
<tr>
<th>Service</th>
<th>Education Only Group</th>
<th>Comprehensive Intervention Group</th>
<th>( P ) Value between Groups †</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n* Percent Offered</td>
<td>Percent Offered</td>
<td></td>
</tr>
<tr>
<td></td>
<td>First Survey</td>
<td>Second Survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influenza vaccine</td>
<td>694 79</td>
<td>89</td>
<td>0.01</td>
</tr>
<tr>
<td>Pneumococcal vaccine</td>
<td>650 42</td>
<td>73</td>
<td>0.01</td>
</tr>
<tr>
<td>Tetanus vaccine</td>
<td>622 64</td>
<td>72</td>
<td>0.01</td>
</tr>
<tr>
<td>Mammography</td>
<td>390 90</td>
<td>80</td>
<td>0.01</td>
</tr>
<tr>
<td>Exercise counseling</td>
<td>385 85</td>
<td>79</td>
<td>0.05</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>657 75</td>
<td>78</td>
<td>0.16</td>
</tr>
</tbody>
</table>

* n, the number of patients in whom the service was indicated; patients who answered “not applicable” were not included.
† Based on analysis of variance with patients clustered within physicians.
was not significantly greater in the comprehensive intervention group than in the education only group (Table 3). However, patients in the comprehensive intervention group thought that their quality of care improved ($P < 0.05$ for art of care, technical quality of care, and the combination) whereas satisfaction in the education only group did not improve significantly.

To determine whether the patient satisfaction score was related to patient responses as to whether a specific preventive care service was offered, the mean satisfaction scores were compared for those patients who responded “yes” and those who responded “no” for each service. Generally, patients reporting that a preventive care service had been offered expressed greater satisfaction with their physician; mean scores were 0.02 to 0.42 points (a median of 0.29) higher for the seven preventive care services and were usually significant.

**DISCUSSION**

We examined the impact of physician education, academic detailing, and peer-comparison feedback on the provision of preventive services and on patient satisfaction. The number of patients who reported that they had been offered preventive care services, including influenza, pneumococcal, and tetanus immunization and exercise counseling, increased from the first to the second survey. However, this increase was significantly greater for the comprehensive education group only when the rates had been lower in the first survey.

The rates of reported mammography and clinical breast examination decreased in the education only group, but not in the comprehensive intervention group. Although most clinicians agree about the importance of breast examination and mammography, the failure to improve breast cancer screening rates could have occurred because some clinicians believe that yearly examinations on the elderly are unnecessary (7) and worry about patient discomfort (8). Indeed, during the intervention period, educational material that was unrelated to the study was disseminated to suggest that mammography every other year may be sufficient. Furthermore, many clinicians are uncomfortable with their skills in clinical breast examination (9), are unsure of the guidelines, or overestimate their delivery of comprehensive care (10).

While most clinicians agree that influenza immunization is effective, many believe that it is unnecessary and
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that patients do not want it. Many physicians overestimate how often they immunize patients (11). Another potential problem is that patients may not recall specifically which immunizations they received. Because tetanus and pneumococcal immunizations are recommended at relatively infrequent intervals, their rates of use may be underestimated by patients.

We found substantial inconsistency in the results obtained from the review of medical records and from the patient survey. Medical record review and patient survey information often did not agree regarding influenza immunization, mammography, and clinical breast examination. Patient recall is thought to be fairly accurate for immunizations (12,13), but studies examining patient recall for other services show inconsistent results (14–16). Unfortunately, there is no gold standard for ascertaining the delivery of preventive services. While medical record review is subject to poor and illegible documentation, patient survey is subject to recall bias. Furthermore, some preventive care services may be performed outside of the medical group and would not be documented in the medical record. Many community centers and retail pharmacy chains, for example, offer influenza immunization, leading to a possible disparity between medical records in the primary care provider’s office and patient recall. Finally, the patient survey asked whether a patient was offered a procedure, whereas medical record review only recorded those that were actually performed. Given these concerns, the rate of preventive care procedures is likely to be higher as measured by patient survey than by medical record review.

A recent meta-analysis demonstrated that peer-comparison feedback led to modest changes in physician practice (17). Because the clinical effect was small, the authors raised the question of whether profiling large numbers of physicians was worthwhile. Moreover, since many profiling studies included physicians-in-training, the results may not be generalizable to physicians in practice. Academic detailing, when performed by a pharmacist, however, has been shown to be of benefit in changing drug prescribing behavior (1,18,19). We therefore chose to include both methods in our comprehensive intervention. Although there was a cost associated with the creation and publication of educational materials, the collection and analysis of data, and pharmacist time to perform academic detailing, the marginal cost of data collection will decrease as computerized clinical databases and electronic medical records are used more widely.

Physician education, academic detailing, and peer-comparison feedback have a modestly beneficial effect on patient satisfaction and may improve provider adoption of preventive guidelines. These techniques can be readily implemented with existing resources at many physician and health care organizations. However, the delivery of some preventive care services was not improved by these interventions, and many of the improvements were not confirmed by medical record abstraction. Additional randomized trials, perhaps including some that are directed at patients, should be performed to determine the efficacy of other approaches to improving the delivery of preventive services.

REFERENCES