Preventive Content of Adult Primary Care: Do Generalists and Subspecialists Differ?

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Abstract: We compared preventive care performed by 20 generalists and 20 subspecialists practicing in Santa Clara and San Mateo Counties, California, by auditing charts of adult primary care patients for compliance with recommendations of the Canadian Task Force on the Periodic Health Examination. Generalists and subspecialists both provided 49 per cent of recommended preventive services. The two groups did not differ significantly in performance of any individual service. Performance varied widely within both groups. Of many factors explored, only two were associated with more preventive services: provision of a complete physical examination to the patient, and a physician's belief in the importance of a given service. The "generalist vs. subspecialist" debate assumes that a physician's specialty classification is an important predictor of behavior. For the performance of preventive care, this was not true in our study. Instead, physicians' beliefs and practice habits may be major determinants of the quality of preventive care provided. These exploratory findings needed confirmation in other settings. (*Am J Public Health* 1984; 74:223–227.)

Introduction

The importance of primary health care is widely accepted. Health manpower legislation of the last decade specifically attempted to increase the number of physicians trained in the primary care specialties.[1] The label "primary care physician" has assumed added significance with the creation of payment plans where only such providers may initiate test use or referrals.[2] Yet, the imprecision of the term "primary care" and the difficulty of specifying those characteristics which effectively separate it from secondary or tertiary care have engendered a continuing argument over the appropriate staffing, content, and measurement of primary care.[3] Most recently, the debate has focused on the contribution of subspecialists to the delivery of primary care and the national proportion of generalists and subspecialists which would be the most appropriate.

In their assessment of future manpower requirements, Aiken and colleagues concluded that one in five Americans receive their primary care from physicians with subspecialty training.[4] However, they noted that the acceptability of such a situation could only be judged in light of future determinations of the quality and costs of primary care delivered by generalists and subspecialists. How best to make such determinations remains unclear. Peterson has stated that, in delineating primary care practice, we must consider the differing content of the care that is delivered by various types of providers.[5] Rogers has stressed the importance of outcome measurements, arguing that such determinations must reflect primary care's distinguishing central concerns, namely, the maintenance of health and the maximization of function over prolonged periods of time.[6]

To address concerns about both content and extended outcome, we chose to explore the preventive care that generalists and subspecialists provide to their adult primary care patients. The provision of preventive care is the only medical content characteristic specifically referred to in the Institute of Medicine's operational definition of primary care.[7] In addition, although not a direct measure of the functional status of patients, the performance of certain preventive services has been rigorously linked to improved individual and societal long-range health outcomes.[8] Therefore, we addressed the question, "Is a subspecialist serving as an adult patient's primary care physician more or less likely than a generalist to perform indicated preventive care?"

Methods

The study was based on a retrospective chart audit of the preventive care provided in three multispecialty groups by 40 generalist and subspecialist physicians to their adult primary care patients.

Selection of Physicians and Patients

For operational feasibility, we approached the non-hospital affiliated groups within 40 km of Stanford University Medical Center which: offered a full range of physician services; used one chart shared by all physicians in that group; and cared for a broad range of patients in terms of age, socioeconomic status, and insurance coverage. Patients with prepaid insurance belonged to Take Care, an independent practice association.

Generalists included family physicians and general internists. Subspecialists included all internists who were listed as subspecialists in the American Medical Directory.[9] All physicians were board eligible or certified. Physicians supplied information on their age, board certification status, years of current practice, patients seen per hour, and rated the importance of each preventive service from a low of 1 to a high of 10.

Primary care patients were selected using a care classification algorithm previously employed by Mendenhall.[10] For each outpatient seen over a designated three-day period, the participating physicians answered five questions:
- Have you seen this patient before?
- Do you provide a majority of the patient's care?
- Do you provide regular care?
- What was the referral source? (self-referral, agency, other physician, etc.)
- Do you assist in care or provide care?

Patients who had been seen previously, received regular care and the majority of care by their physician's reckoning were designated "principal care" patients of that physician. Mendenhall and colleagues have concluded that the category of principal care meets "consensus criteria for primary care."[11] Excluded from the study were four other categories of care generated by the algorithm: first encounter care,

episodic care, consultative care, and specialized care. The names of each physician's primary care patients were listed in random order by computer. The first ten patients on each physician's list who were at least 16 years old and who had seen that physician for at least a year became the study patient population.

Chart Audit

Each chart was audited by the authors for selected patient characteristics and the provision of those preventive services considered by the Canadian Task Force on the Periodic Health Examination[8] to have good or fair evidence of efficacy based on a randomized controlled trial, a case control study, or a cohort study and good or fair evidence of benefit. For men and women, these services included a blood pressure measurement at each visit, an annual influenza immunization (65 years and over), an annual stool test for occult blood (45 and over), and a tetanus immunization every ten years; for women between ages 50 and 59, an annual breast examination and mammogram were included; for women ages 16 through 34, a Pap smear was recommended at least every three years, changing to every five years from ages 35 through 59. Although there were seven services recommended overall, the number of appropriate services for a given patient varied from two to six depending on age and sex.

A patient was considered eligible for a given service if age and sex were appropriate and there was no contraindication, such as an allergy to an immunization. The service was considered done if there was documentation of its offer or performance in the chart during the designated interval prior to the index visit. For blood pressure, where measurement was recommended at every visit, only the index visit was assessed. For Pap smear and tetanus immunization, where the appropriate interval exceeded one year, charts were assessed over the designated interval or back to the earliest visit recorded. If there was no mention of the service, it was considered not done. We also recorded who performed the service.

After charts were reviewed, we reaudited a random 10 per cent achieving between 94 and 98 per cent inter-observer agreement on each item audited.

Data Analysis

The physician is the unit of analysis for this study, unless otherwise noted. To determine a physician's total preventive score, we divided the number of specific services done by the total number of eligible Task Force recommended services for all of that physician's study patients. Multiplication by 100 yielded a simple percentage. A similar score was calculated for each individual service. A patient's preventive score was similarly computed by dividing the number of services done for that patient by that patient's total number of eligible Task Force recommended services.

Prior to the study, we decided that a meaningful difference in preventive scores between generalist and subspecialist physicians would be 20 per cent. To compare physician or patient groups, t-tests for independent samples were used for continuous data and two-by-two contingency tables for dichotomous data. The association between physician or patient characteristics and preventive scores was tested using the Pearson product moment correlation for continuous data and the point biserial correlation for dichotomous data. All statistical tests used an alpha level of 0.05, with appropriate Bonferroni correction for multiple comparisons.

Results

Characteristics of Study Physicians and Patients

From the three eligible groups, 40 of the 55 physicians (73 per cent) who had been with the group for at least a year agreed to participate. All were male. Twenty were generalists, including 12 general internists and eight family physicians. Twenty were subspecialists, including five rheumatologists, four cardiologists, four hematologists-oncologists, four gastroenterologists, one allergist, one endocrinologist, and one pulmonary physician. All had at least three years of postgraduate training. Characteristics of generalists and subspecialists were similar and are summarized in Table 1. Nonparticipants did not differ significantly from participants in mean age or percentage of board certification. Rates of participation did not differ significantly between generalists and subspecialists. Overall, physicians in both groups had a similar proportion of patients eligible for each service.

The study physicians saw 1,654 patients during the selection period. Care classification proportions were consistent between family physicians, general internists, and medical subspecialists in this study and their counterparts in Mendenhall's national sample[10] of 10,372 physicians. The care-classification algorithm identified 1,089 as recipients of principal care. From these, the random selection process yielded 368 study patients. Although 400 were expected,

TABLE 1—Characteristics of Generalist and Subspecialist Physicians

Physicians	Generalists (n = 20)	Subspecialists (n = 20)
Age in Years*	46 ± 7	45 ± 12
Per Cent Board Certified in Field of Residency	100	85
Years of Current Practice	13 ± 11	13 ± 8
Patients Seen per Hour	3.6 ± 0.6	3.1 ± 0.6
Physicians' Ratings of Importance:†		
Blood Pressure Measurement	7.8 ± 1.9	7.7 ± 2.2
Breast Examination	9.6 ± 0.6	9.5 ± 0.8
Influenza Immunization	5.8 ± 2.5	6.7 ± 2.0
Mammogram	3.9 ± 1.8	4.6 ± 2.3
Pap Smear	9.3 ± 1.3	9.6 ± 0.8
Stool Occult Blood	9.2 ± 1.2	8.9 ± 1.2
Tetanus Immunization	8.0 ± 2.5	7.7 ± 2.5

*Mean ± S.D. or simple percentage.
†On 10-point scale, 1 (low) to 10 (high).

TABLE 2—Characteristics of Patients Who Received Primary Care from Generalists versus Subspecialists

Patients	Received Generalist Care (n = 182)	Received Subspecialist Care (n = 186)
Age in Years*	52 ± 20	58 ± 17†
Per Cent Female	58	53
Years with Physician	5.7 ± 6.0	5.0 ± 4.2
Visits with Physician (during last 12 months)	4.4 ± 3.8	6.0 ± 5.2†
Number of Providers Seen (during last 12 months)	1.9 ± 1.1	2.2 ± 1.7
Per Cent with Prepaid Care	27	10†
Per Cent Who Received Complete Physical Examination (during 12 months)	31	37

*Mean ± S.D. or simple percentage.
†Difference significant at p < 0.05 by t-test for continuous data, two-by-two contingency table for dichotomous data, with Bonferroni correction for multiple comparisons.

certain physicians had joined their groups little more than a year before the study's initiation and so saw few patients during the selection period to whom they had provided care for a full year or more. The characteristics of study patients are presented in Table 2. Patients of subspecialists were older, had more physician visits during the year, and were less likely to have prepaid care. On average, patients of generalists received an average 3.5 services each while those of subspecialists received 3.6 services each.

Performance of Preventive Care

The preventive score means and ranges for generalists and subspecialists are compared in Figure 1. There was no difference between the two groups in either the seven individual service scores or in total scores. Evidence of tetanus immunization, influenza immunization, and mammography was found in less than 25 per cent of the sample patients. Overall, both groups performed 49 per cent of the seven recommended services. If a given service was provid-
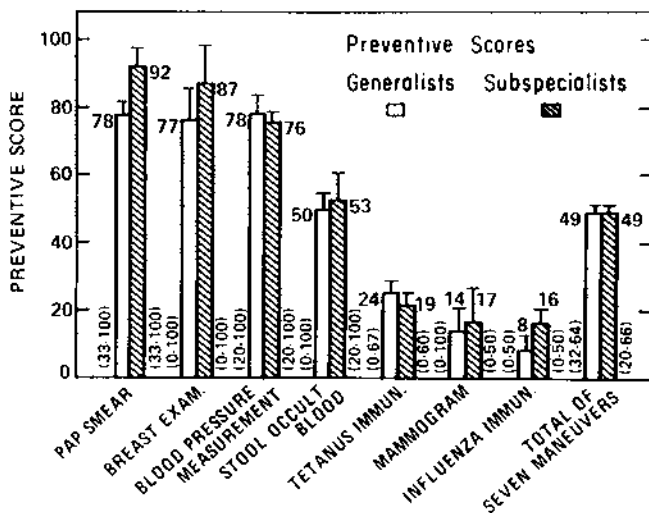

FIGURE 1—Comparison of Mean Preventive Scores: Generalists versus Subspecialists

Bars represent preventive score means and upper limit of S.E.M. for each group. The number of generalists or subspecialists who had patients eligible for any given maneuver varied from 11 to 20 and did not differ significantly between groups. Figures in parentheses represent ranges for physician groups. None of the differences were significant at p < 0.05 by t-test, with Bonferroni correction for multiple comparisons.

ed, the provider was almost always the patient's designated physician. With the exception of Pap smears, subspecialists were as likely as generalists to perform a given service themselves (as opposed to referring the patient to a colleague for preventive care).

To ensure that services were performed for preventive, not diagnostic, reasons, we also computed scores after exclusion of all services that might have a diagnostic basis. Services were excluded if the patient also had a diagnosis in the same system category of the International Classification of Health Problems in Primary Care (ICHPPC).[12] For example, we excluded all patients with peptic ulcer from the guaiac test. This did not alter results, so we report results without the exclusion. Our study had a statistical power of 99 per cent to detect a 20 per cent difference in total scores between physician groups (alpha = 0.05). The range of physicians' total scores was wide. Among all physicians, total scores varied from 20 to 66. Scores for the individual services exhibited even greater variation.

Because blood pressure measurement and tetanus immunization were recommended for all patients, they exerted a powerful effect on the total scores. To determine if this attached unwarranted importance to their performance versus the other five services, preventive scores were recomputed with each of the seven services weighted equally. This resulted in total score changing slightly (subspecialists 52, generalists 47), but not significantly.

Factors Associated with Differential Performance

Within each group, physicians varied widely in their compliance with the recommendations. Table 3 summarizes a series of exploratory bivariate correlations between performance and available variables. A multivariate analysis yielded similar results.

Of the physician characteristics examined, only the importance ratings given to individual services correlated with performance of those services (r = +0.45). To facilitate our understanding of how this correlation might translate into differing levels of performance, we dichotomized the importance ratings of the physicians into two categories (6 and above were "important," 5 and below were "unimportant"). As Figure 2 shows, physicians performed a significantly higher percentage of those services rated important.

As Figure 3 shows, patients who received a complete physical examination during the year prior to the index visit had significantly higher total scores than those who did not (61 versus 42).

TABLE 3—Association of Physician and Patient Characteristics with Physician and Patient Preventive Scores*

	Correlation Coefficient†
Physician Characteristics	
Age	−0.044
Board Certification in Field of Residency	+0.169
Years of Current Practice	−0.076
Patients Seen Per Hour	−0.123
Service Importance Ratings	+0.454‡
Patient Characteristics	
Age	−0.087
Per Cent Female	+0.024
Years with Physician	+0.137
Visits with Physician (during last 12 months)	−0.070
Number of Providers Seen (during last 12 months)	+0.016
Have Prepaid Care	+0.055
Received Complete Physical Examination (during last 12 months)	+0.349‡

*See text for explanation of preventive scores. Maneuver importance ratings were correlated against physician individual maneuver scores; other physician characteristics were correlated against physician total preventive scores. All patient characteristics were correlated against patient total preventive scores.

†Pearson's correlation coefficient for continuous data; point biserial correlation for dichotomous data.

‡Significant at p < 0.05 by Fisher's Z test for continuous data; Johnson-Welch approximation to the non-central T statistic for dichotomous data, with Bonferroni correction for multiple comparisons.

Discussion

In this study, differences within each physician group far exceeded differences between the two groups. Performance of a complete physical examination and each physician's belief in the importance of a given service were significantly associated with preventive care. If a physician's status as a generalist or subspecialist is less important than beliefs or office behavior in predicting quality of care, could

the "generalist vs subspecialist" debate be missing the point? We will explore several alternatives to this idea.

Perhaps provision of these seven specific services does not reflect the true quality of preventive care. After all, they are far from covering the breadth of preventive care; only two are indicated for men ages 16–44 and these two only address prevention in normal, not high-risk, groups. However, of the 78 conditions reviewed by the Canadian Task Force, these seven services best meet their rigorous evaluation criteria. Other expert bodies concur on these same few services.[13] We submit that these services represent a conservative minimum of preventive care. Just as one could argue that without attention to preventive care, primary care is not provided, we would argue that without attention to these seven services, preventive care is not provided.

Could issues of case mix give one specialty group an advantage? Perhaps age and sex differences in patients served made it harder for one of the groups to provide preventive care. But, physicians—not patients—are the unit of analysis. Physicians are compared for age- and sex-specific services. Patient case mix was controlled. Further, the two physician groups had a similar proportion of patients eligible for each service, and patient age or sex had no significant association with preventive care. Likewise, morbidity differences were explored by exclusion of patients who had diagnoses in the same ICHPPC system category (and therefore more illness). This did not change preventive scores of either group significantly.

Could this chart audit have failed to capture what really transpired? The methodological problems associated with data from chart audit have been well documented.[14–15] The data reflect preventive services recorded, as opposed to those done. The possibility that patients may have been receiving care at multiple settings might also have led to underestimates of what actually happened. For one of the group practices, there is evidence that for prepaid patients,
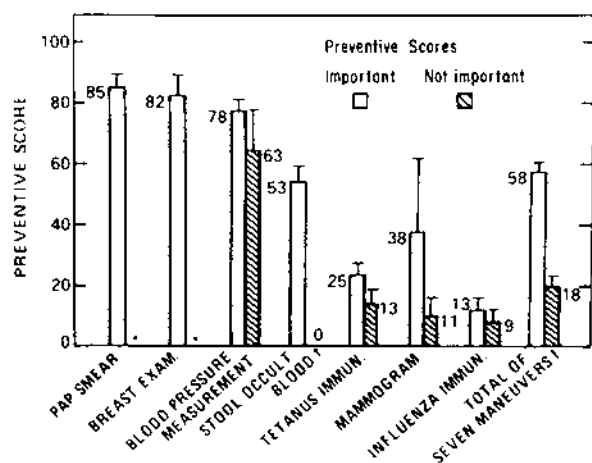

FIGURE 2—Comparison of Mean Preventive Scores: Physicians Who Considered a Maneuver Important versus Physicians Who Did Not

Bars represent preventive score means and upper limit of S.E.M. for patients who received a complete physical examination during the previous year (n = 128) versus those who did not (n = 240).

*Difference significant at p < 0.05 by t-test, with Bonferroni correction for multiple comparisons.
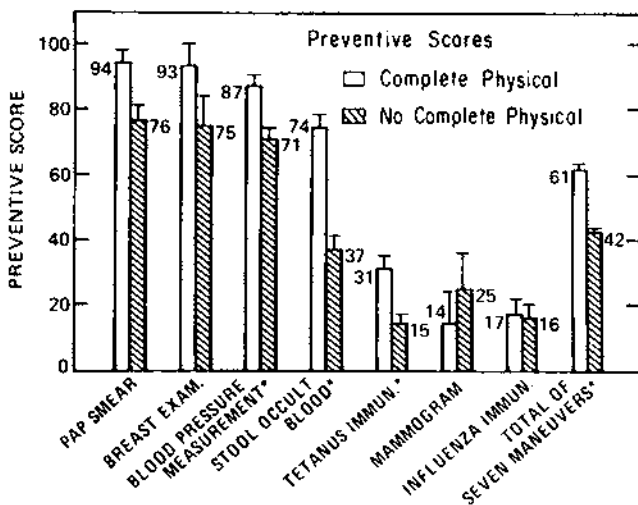

FIGURE 3—Comparisons of Mean Preventive Scores: Patients Who Received a Complete Physical Examination versus Patients Who Did Not

Bars represent preventive score means and upper limit of S.E.M. for physicians who rated a given service important (6 to 10) versus not important (1 to 5).

*No physicians rated Pap smear and breast examination as having an importance < 6.

†Difference significant at p < 0.05 by t-test, with Bonferroni correction for multiple comparisons.

non-occasional out-of-plan use is in fact limited to 2 per cent of plan members.[16] Even if a substantial percentage of patients received preventive care from outside physicians, this should not have relieved the study physicians of responsibility for inquiring about this possibility and recording in the chart services performed elsewhere.

A more serious challenge asks, Is this a special, non-generalizable physician sample? It was not randomly drawn and was both organizationally and geographically circumscribed. However, our study physicians' care classification was similar to Mendenhall's findings. In addition, contemporary performance of preventive services in other locales does not appear to be dissimilar.[17-19] But even if the findings of this study represent the preventive services offered by metropolitan multispecialty groups, generalization to other geographic areas or practice arrangements is unwarranted in the absence of confirmatory data from such settings.

Similarity in preventive performance between subspecialist and generalist physicians is not easily dismissed on methodological grounds. If these findings are confirmed in other settings, changes in the proportion of physicians who receive generalist versus subspecialist training may have little impact on the quality of preventive care. Instead, we may need to look elsewhere to improve care.

Two promising directions include physicians' beliefs (importance ratings) and physicians' performance of the complete physical examination. Both groups rated mammography lowest in importance and performed it least. Those agencies which feel strongly about the benefits of such a service apparently still need to convince physicians. An American College of Physicians' editorial recently called for physicians to abandon the annual complete physical examination.[20] What might be the effect of such an action on preventive care? If no alternative is adopted to remind physician and patient of the need for preventive care, will we be running the risk of throwing out the preventive care baby with the annual physical bathwater? Clearly, promotion of the periodic (not annual) health examination and incorporation of preventive services into routine care are essential.[21]

Two final notes of caution are in order. Few patients were enrolled in prepaid insurance plans so the impact of prepaid care could not adequately be explored. Also, only three of the participating generalists graduated from residencies developed recently to expressly prepare physicians for careers in primary care. Although preliminary reports indicate otherwise,[22,23] it will be interesting to see if graduates of such programs possess values or practice habits which set them apart as a group. This is an important question for future research.

Despite the limitations noted, we feel this study's findings should be sufficient to deter *a priori* assumptions about the quality of primary care delivered by generalists versus subspecialists. As regards one essential component of primary care, i.e., preventive care, generalist and subspecialist labels may be very poor predictors of any given physician's beliefs or behavior.

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