The Patient-Physician Relationship, Primary Care Attributes, and Preventive Services

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Background: *The importance of a sustained relationship between patients and physicians is a defining characteristic of family medicine. This study examined whether there is an association among the length of the patient-physician relationship, various attributes of primary care, and the delivery of clinical preventive services to Medicare beneficiaries.* Methods: *The data source for this study was the 1993 Medicare Current Beneficiary Survey. Primary care attribute scales were developed by conducting a factor analysis of 17 survey questions. Three clinical preventive services were measured as outcomes: influenza vaccination, mammography, and an eye examination for diabetics. Path analyses were used to test the relationships between length of relationship, primary care attributes, and delivery of clinical preventive services.* Results: *As the length of the relationship increased, scores on communication, accumulated knowledge of the patient by the physician, and trust all improved. Length of relationship and communication predicted accumulated knowledge of the patient by the physician, accumulated knowledge predicted trust, and trust predicted delivery of preventive services.* Conclusions: *Among elderly Medicare beneficiaries, the ability to develop a sustained relationship with a provider is related to the realization of other important attributes of primary care. Trust was associated with delivery of important clinical preventive services. Efforts should be made to protect the ability of patients and physicians to sustain a relationship over time.*

A defining characteristic of family medicine as a discipline is the development of a sustained relationship between patient and physician over long periods of time.[1] Benefits of this sustained relationship are hypothesized to occur as patient and physician work through multiple episodes of illness and establish an enduring relationship over the life of the patient.[2] In recognition of the importance of this basic attribute, the Institute of Medicine has defined primary care as:

> . . . the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community.[3]

From this sustained relationship over time, other attributes of primary care are thought to arise, including trust, comprehensiveness of care, interpersonal communication, and accumulated knowledge of the patient by the provider.[4]

What evidence is there that a sustained relationship between a patient and a physician is beneficial? In a study of the length of the doctor-patient relationship and the subjective rating of 133 general practitioners of the level of their accumulated knowledge about 30 consecutive patients, investigators found that longer length of relationship was associated with greater knowledge about each patient.[5] In about one third of encounters, physicians reported extensive knowledge about their patients. For these patients, it required at least 1 year, and often 5 years, to create such a high level of knowledge. In a separate study, physicians' knowledge of patients and patients' trust in their physician were associated with patients' adherence to health habit advice provided by their physician.[6]

Other attributes of primary care may also be important in improving patient care. Flocke reported that scores on communication and coordination of care were associated with being more up to date on screening services and health habit counseling.[7]

Unfortunately, a recent study revealed declines in communication, interpersonal treatment, and thoroughness of physical exams among Medicare beneficiaries.[4] This study examined the relationships between the duration of a sustained relationship with a provider, the attributes of primary care, and the delivery of clinical preventive services to Medicare beneficiaries. The specific preventive services studies were influenza vaccination in the past year, mammogram in the past 2 years for women, and a visit to an ophthalmologist in the past year for those with diabetes.

Based on the studies discussed above, we formulated four hypotheses. First, the length of the relationship between patient and provider will be associated with accumulated knowledge of the patient by the provider. Specifically, the longer the relationship, the higher the accumulated knowledge score. Second, better communication between patient and provider will be associated with accumulated knowledge of the patient by the provider, with higher scores on a measure of communication predicting higher scores on accumulated knowledge. Third, accumulated knowledge of the patient by the provider will be associated with higher patient trust scores. Fourth, higher trust scores, in turn, will be associated with a higher likelihood of successful delivery of the three aforementioned preventive services.

Methods
Data Source
The data for this analysis were obtained from the Medicare Current Beneficiary Survey (MCBS) conducted in 1993. The MCBS is a multipurpose, longitudinal survey of a representative sample of the Medicare population and is sponsored by the Health Care Financing Association (HCFA).[8] The MCBS provides a profile of the Medicare population with respect to an individual's use of health services, medical care expenditures, health insurance coverage, health status, and sociodemographic characteristics.

MCBS used a multistage sampling design; 107 primary sampling units were selected, from which 1,163 geographic clusters were chosen, followed by systematic sampling by age strata based on the 5% HCFA enrollment file. Computer-assisted personal interviewing was used in community interviews that lasted about 1 hour. For this analysis, only subjects ages 65 and older were included.

Length of Relationship With Provider
The survey asked how long patients had been seeing their usual doctor. The responses available to this question were less than 1 year, 1 year to less than 3 years, 3 years to less than 5 years, 5 years to less than 10 years, and 10 years or more.

Considering only those who stated that they had a usual provider, we examined responses to the survey to ascertain the length of the relationship between each Medicare beneficiary and his/her physician.

Defining Primary Care Attributes
Commonly agreed-on attributes of primary care include comprehensiveness, accumulated knowledge of the patient by the provider, communication, and trust.[2,9,10] We therefore sought survey items that were reflective of one of these attributes and identified 17 such items in the MCBS.

Rather than subjective assignment of items to the attribute, we used factor analysis to guide the classification of these 17 items into groups. Factor analysis is a statistical technique used to detect structure in the relationship between variables as perceived by the respondent (ie, to classify variables into groups that reflect an underlying construct or similarity such as an attribute of primary care). Factor analysis using principal component analysis with varimax rotation and Kaiser normalization was used. Factors were included for eigenvalues greater than 1.00. The analysis identified four such factors that were used as predictor variables in this study (see Table 2).

Delivery of Preventive Services
Delivery of preventive services was measured by assessing three services commonly used in quality assessments: receipt of an influenza vaccination during the past winter, a mammogram in the past 2 years for women, and an eye exam in the past year for patients with diabetes. These three indicators are included in a set of 24 indicators used by the Centers for Medicare and Medicaid Services to track the quality of care delivered to Medicare beneficiaries.[11]

Assessment of influenza vaccination and mammogram were derived from patient self-report on the survey. The questions asked were: "Did you have a flu shot for last winter?" and "Have you had a mammogram or breast X ray in the last year, that is, since this date a year ago?" Determination of an eye exam was derived from administrative claims data indicating a visit to an ophthalmologist in the past year.

Analysis
In this analysis, we wanted to test a theoretical model of associations between attributes of primary care and outcomes related to delivery of preventive services. As discussed, we hypothesized that longer duration of the relationship between patient and provider will predict greater knowledge of the patient by the provider, which in turn will predict higher patient trust, which will be associated with a higher likelihood of delivery of clinical preventive services.

We used path analysis to examine these relationships between the predictor variables (attributes of primary care) and the outcomes (delivery of preventive care services).[12] Path analysis is based on simple regression

techniques, but it moves beyond testing whether a set of independent variables predicts an outcome to testing the relationships among all of the variables. Path models are considered a type of causal model that depicts hypothesized directional relationships among a set of variables. By analyzing the paths, the analysis tests the consistency between the data and a hypothesized theoretical model. If the data do not fit the model, this suggests that the model and its underlying theory may require revision.

Results
Sample Characteristics

The final sample included 10,232 Medicare beneficiaries. As shown in Table 1, the mean age of the subjects was 76.4 years, and the majority were non-Hispanic white and female.

More than half of the subjects reported that the current length of relationship with their primary care physician was 5 years or more.

Primary Care Attribute Scales

Results of the factor analysis are shown in Table 2. Factor one included six items and was labeled comprehensiveness of care (alpha=.78). Factor two included six items describing accumulated knowledge of the patient by the provider (alpha=.84). Factor three included four items describing provider-patient communication (alpha=.81). Factor four included three items describing trust (alpha=.78). Factor five included only two items, which had low internal consistency (alpha=.4589). The item "How satisfied are you with the availability of medical care at night, on weekends?" was then subsumed under Factor 1 (comprehensiveness); alpha reliability for these seven items was very good (alpha=.85). Likewise, the item "Your doctor is competent and well-trained," was subsumed under factor four (trust); alpha reliability for these seven items was very good (alpha=.84). Finally, before calculating composite scale scores, we converted item responses to standardized z scores (where the mean value is 0 and the standard deviation is 1). Composite scale scores were means of the component items. High scores indicated a high primary care orientation. Thus we created four primary care attribute scales guided by factor analysis findings.

Length of Relationship and Primary Care Attributes

The relationships between patient report of how long they had been seen by their current provider and the scores on each of the four primary care attribute scales are shown in Figure 1. The mean score for all four attributes increased as the length of the relationship increased. Analysis of variance revealed that all of these relationships were significant.

Table 1

Characteristics of Sample

Age, mean (SD)	76.4 (7.7)
Female (%)	60.8
Race/ethnicity (%)	
Non-Hispanic white	86.0
Hispanic	8.6
Black	2.3
Other	3.1
Preventive services (%)	
Influenza vaccination	50.5
Mammogram	29.8
Eye exam	6.4
Length of Relationship (%)	
Less than 1 year	10.3
1 to 3 years	18.8
3 to 5 years	18.0
5 to 10 years	20.7
10 years or more	32.3

SD—standard deviation

Trust and Preventive Service Delivery

Trust scores were significantly higher for those who received an influenza vaccination in the past 12 months (t test=8.92, $P<.001$), women who received a mammogram in the past 2 years (t test=2.75, $P<.05$), and for diabetic subjects who had a visit to an ophthalmologist in the past year (t test=2.36, $P<.05$).

Path Analysis

The influenza analysis includes all of the subjects, the mammogram analysis includes only women (n=6,221), and the eye exam includes only those with a known diagnosis of diabetes (n=1,935). The numbers above each of the arrows in the path model shown in Figure 2 are standardized beta coefficients for the hypothesized paths in the final model. All coefficients were significant at $P<.05$. Both the length of the relationship with the provider and the score on the communication scale had a significant direct effect on accumulated knowledge of the patient by the provider in the hypothesized direction. Accumulated knowledge predicted trust, and trust predicted delivery of each of the three preventive services.

Discussion

Length of the physician-patient relationship is associated with patient-perceived attributes of primary care. As the length of the relationship increases, so do patient reports of accumulated knowledge, communication, and trust. In addition, the path model results suggest that the length of the relationship, along with the level of communication between patient and physician, are predictive of trust, and that trust is predictive of the receipt of clinical preventive services. These findings

Table 2

Primary Care Attribute Composite Scores

| Attribute	Mean	SD	Range	Alpha
Comprehensiveness of care	3.18	.43	1-4	.78
How satisfied are you with getting all of your medical needs met at the same location?				
How satisfied are you with your doctor's concern with your overall health, not just the single disease?				
How satisfied are you with your follow-up care?				
How satisfied are you with information given you about what was wrong with you?				
How satisfied are you with the overall quality of medical care you have received in the past year?				
How satisfied are you with the availability of care at nights and on weekends?				
Accumulated knowledge	3.21	.47	1-4	.84
Your doctor has a good understanding of your medical history.				
Your doctor has a complete understanding of what is wrong with you.				
Your doctor is careful to check everything when examining you.				
Your doctor is competent and well-trained.				
Interpersonal communication	3.04	.45	1-4	.81
You often have problems that should be discussed but are not.				
Your doctor does not explain medical problems to you.				
Your doctor often acts as if he/she was doing you a favor by talking to you.				
Trust	3.11	.47	1-4	.78
You depend on your doctor to feel better, emotionally and physically.				
Your doctor answers all of your questions.				
Your doctor tells you all you want to know about your condition and treatment.				
You have great confidence in your doctor.				

SD—standard deviation
Mean—determined by a Likert scale of 1–5, with 5 as the highest rating

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are supported by the results of a study of adult patients in the United Kingdom and the United States that found that trust was related to length of time of the physician-patient relationship. [13]

Why should the development of a sustained relationship between patient and provider be important, not only to patients and providers but also in the design of our health care system? It is likely that decision making by the provider is based on prior knowledge about the patient's medical history, personality, and social network. Based on this accumulated knowledge, treatment decisions are tailored to the individual patient. Indeed, Hjortdahl found that more than half of the accumulated knowledge of patients by their physician was explained by the duration of the relationship. [5]

Disrupting a doctor-patient relationship can have a negative influence on communication and accumulated knowledge. In one study of family medicine patients, those who reported
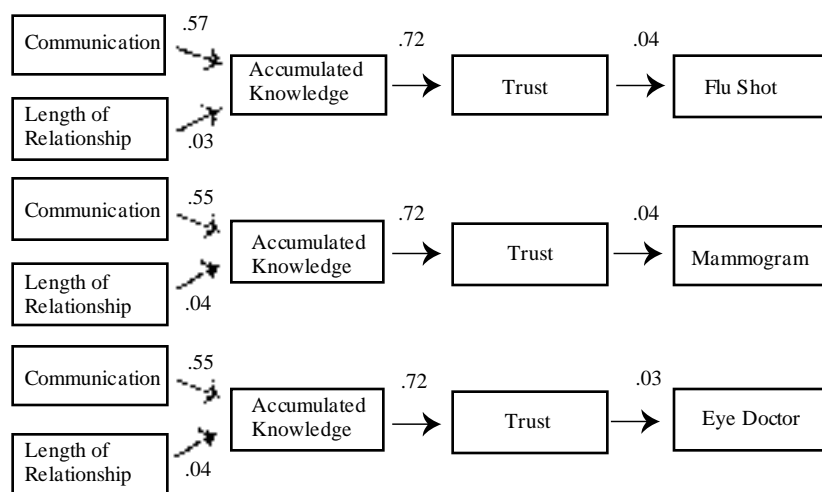
Figure 1

Length of Relationship and Primary Care Attributes
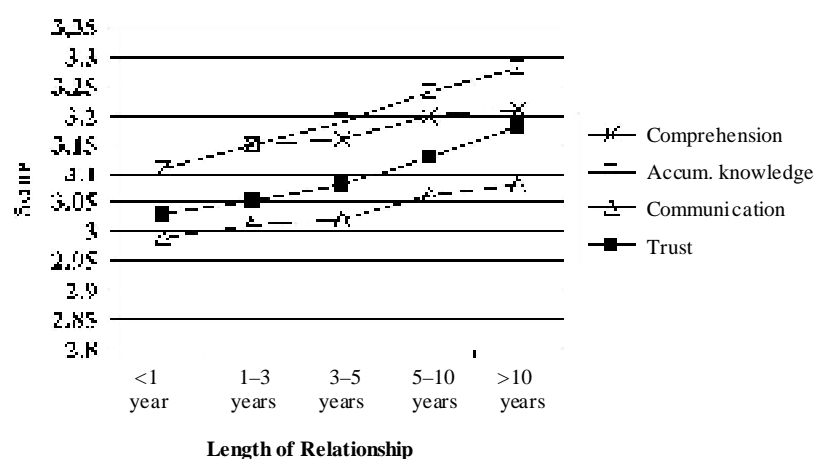
Comprehensive: F=12.11, *P*<.001
Accumulated knowledge: F=38.69, *P*<.001
Communication: F=12.34, *P*<.001
Trust: F=34.34, *P*<.001

Figure 2

Path Models

* The numbers next to each arrow are standardized beta coefficients.

All values are significant at *P*<.05

a forced change in physician due to changes in health insurance coverage rated their interpersonal communication with their physician and the accumulated knowledge of their physician about their medical history, and then overall health, significantly lower than those who did not experience such a disruption.[14] If communication and accumulated knowledge predict trust, and if trust predicts delivery of clinical preventive services, then it is possible that disruptions in the patient-physician relationship may result in a decline in delivery of these services.

Continuity is also associated with disease-specific health outcomes. Visit-based continuity is associated with improvement in glucose control among patients with type 2 diabetes.[15] The investigators, in a study of the relationship between continuity and glucose control, found that the relationship was mediated by improved self-care behavior for diet. In perhaps the only randomized trial of continuity, elderly patients with higher levels of continuity had fewer hospitalizations and emergency room visits.[16] In one of the few studies of the length of relationship with a physician among Medicare beneficiaries, the length of time of an established usual source of care was associated with lower costs of care.[17]

Limitations

This study is limited by the cross-sectional nature of the data. It is possible that the hypothesized directions of the path model may not be true. For example, the receipt of a preventive service by patients may lead to an increase in the patients' perception that the physician knows them better, thus increasing their trust in the physician. This issue of directionality is also of concern for the relationship between accumulated knowledge and a sustained relationship. When patients perceive that their physician knows them better, they may be more likely to maintain a sustained relationship with that physician. Further research is needed using prospective data with multiple measures of primary care attributes over time to further clarify this issue of directionality.

There may also be measurement error from patient self-report of the receipt of a clinical preventive service, especially in an older population with declining mental status. For the mammography analysis, mammography was only recommended for women up until age 74. We ran the model for mammography including females and again for females under the age of 75 and found no difference in our results.

Conclusions

In its report *Crossing the Quality Chasm,* the Institute of Medicine cites growing evidence suggesting that improvement and adoption of best practices is limited or promoted by the systems within which care is delivered and that we cannot improve quality and reduce errors unless we change the systems.[18] The results of our study suggest that patients over age 65 may benefit from systems of care that foster a sustained relationship with a physician over time. In reality, however, many Medicare patients who enroll in Medicare managed care plans have been dropped from those plans over the past several years.[19]

Although the effect of this forced change in insurance benefits on the ability to sustain a relationship with a provider is unknown, it is possible that disruptions in relationships occurred. Further longitudinal research is needed to confirm the relationships among length of relationship with a physician, primary care attributes, and the delivery of preventive services.

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