

The Importance of Continuity of Care in the Likelihood of Future Hospitalization: Is Site of Care Equivalent to a Primary Clinician?

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ABSTRACT

Objectives. This study examined the effect of continuity with clinicians and health care sites on likelihood of future hospitalization.

Methods. Delaware Medicaid patient data were analyzed. Logistic regression models supplied adjusted effects of continuity on hospitalization.

Results. Patients in the high clinician continuity group had lower odds of hospitalization than patients in the high site/low clinician continuity group (odds ratio [OR] = 0.75, 95% confidence interval [CI] = 0.66, 0.87). The latter group did not differ from the low site/low clinician continuity group (OR = 0.93, 95% CI = 0.80, 1.08).

Conclusions. A location providing health care without clinician continuity may not be sufficient to ensure cost-effective care. (*Am J Public Health*. 1998;88:1539-1541)

Continuity of health care is conceptualized as having important benefits.¹ The hypothesized advantages to continuity with a clinician are based on the belief that in a long-term patient-physician relationship, a knowledge base is accrued.¹⁻³

In a recent study within the Delaware Medicaid program, we found that continuity with a clinician decreases a patient's likelihood of future hospitalization.⁴ When hospitalizations for ambulatory-care-sensitive conditions (conditions that should be most likely to be affected by continuity) were examined,⁵ it was found that the impact of clinician continuity was no greater for these conditions than for total hospitalizations.

Some evidence suggests that clinician continuity of care is low in group practice settings.⁶ The advantages of long-term clinician continuity may be provided by shared information in a health care site with multiple providers.^{7,8} Consequently, it is important to determine whether the advantages of continuity of care in terms of a site are equal to those inherent in continuity with a particular clinician.

The purpose of this study was to expand our previous study on clinician continuity to examine the advantages of clinician continuity vs site continuity.

Methods

We analyzed paid claims to the Delaware Medicaid program for the period July 1, 1993, through June 30, 1995. To examine the impact of continuity of care on future hospitalization, we measured continuity in the first year and hospitalizations in the second year. More information regarding the methods and selection of the population has been presented elsewhere.⁴

Delaware Medicaid recipients 0 to 64 years of age who were continuously enrolled for the 2-year period and had 3 or more ambulatory physician visits during the first year were included (n = 13 495). Clinicians were identified by "performing provider" designations on Medicaid claims. If a claim did not list a performing provider, the visit was con-

sidered to involve a unique clinician. Site was defined according to "billing provider."

Continuity of care with both clinician and site was measured via the usual provider continuity index.¹ The clinician index was defined as the number of ambulatory visits to a primary clinician divided by the total number of ambulatory visits in the first year. The site index was defined as the number of visits to the primary site divided by the total number of visits in the first year.

The population was divided into 3 groups: high clinician continuity, high site/low clinician continuity, and low site/low clinician continuity. High continuity was defined as a primary site or provider that accounted for at least 50% of visits.⁹⁻¹¹ The primary outcome was the likelihood of an acute hospital admission in the second year.

Bivariate analyses (χ^2 , odds ratios [ORs]) were used to examine the relationship between continuity in one year and likelihood of hospitalization in the subsequent year. Logistic regression models examined the effect of continuity on the likelihood of hospitalization after adjustment for other variables. Control variables entered into the models were age, sex, race, county of residence, Medicaid eligibility category, number of ambulatory visits, and case mix. Case mix was defined by 34 dichotomized "ambulatory diagnostic groups."^{12,13} All categorical variables were entered as dummy variables in the model.

Because there was a possibility that operational decisions in terms of definitions could affect our results, 2 additional analyses were undertaken. First, an analysis was computed that redefined visits to a given site

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with no listed performing clinicians to assume that the visits were to the same clinician (rather than the original assumption of different clinicians). Second, because emergency departments are entry points to hospitalization, a model was computed excluding emergency department visits.

Results

The demographic characteristics of the study population are shown in Table 1. The percentages of the sample in the 3 continuity groups were as follows: high clinician continuity, 46%; high site/low clinician continuity, 25%; and low site/low clinician continuity, 29%.

In terms of hospitalization, 11.9% of the patients were hospitalized in the second year. The relationship between the groups and hospitalization indicated that 9.8% of the high clinician continuity group, 13.4% of the high site/low clinician continuity group, and 14.0% of the low site/low clinician continuity group were hospitalized ($P = .0001$).

The logistic regressions indicated that individuals in the high clinician continuity group were at significantly lower odds of being hospitalized than individuals in the high site/low clinician continuity group (Table 2). The high site/low clinician continuity group was not significantly different from the low site/low clinician continuity group in an adjusted model (OR = 0.93, 95% confidence interval [CI] = 0.80, 1.08).

Subsequent analyses using less conservative assumptions in terms of operational definitions of providers yielded results similar to those of the primary analyses. As in the first model, the high site/low clinician continuity group was not significantly different ($P > .05$) from the low site/low clinician continuity group.

Discussion

The results of this study confirm that continuity with a clinician decreases the likelihood of future hospitalization. Moreover, high continuity with a site but low continuity with a provider was not significantly different than having low continuity with an individual clinician.

These findings have significant implications for health care delivery. Many managed care plans require enrollees to choose a primary care provider to coordinate their care. However, managed care plans may actually decrease continuity for some patients. Many primary care providers in managed care plans are not individuals but groups of physicians.

TABLE 1—Demographic Characteristics of the Study Population (n = 13 495)

	Patients, No.	(%)
Age, y		
0–4	4322	32.0
5–14	3762	27.9
15–24	1805	13.4
24–44	2448	18.1
45–64	1158	8.6
Gender		
Male	5131	38.0
Female	8364	62.0
Race		
White	5329	39.5
Black	7129	52.8
Hispanic	826	6.1
Other/unknown	211	1.6
County		
Kent	2891	21.4
New Castle	7427	55.0
Sussex	3177	23.5
Medicaid eligibility		
Aid to Families with Dependent Children or extended eligibility	10 155	75.3
Supplemental Security Income	3340	24.7
Ambulatory visits in first year, No.		
3 or 4	4480	33.2
5 or 6	2987	22.1
7–9	2579	19.1
10 or more	3449	25.6

TABLE 2—Logistic Regression of Relationship Between Continuity of Care and Hospitalization in the Subsequent Year

	Unadjusted OR (95% CI)	Adjusted OR (95% CI)
Model ^a	0.70 (0.62, 0.80)	0.75 (0.66, 0.87)
Alternative provider definition ^a	0.73 (0.64, 0.84)	0.80 (0.68, 0.94)
Exclusion of emergency department visits	0.76 (0.67, 0.88)	0.85 (0.73, 0.99)

Note. OR = odds ratio; CI = confidence interval.

^aHigh clinician continuity vs high site/low clinician continuity.

This study suggests that the information available at a health care site does not match the accrued knowledge between patients and physicians. However, as health systems move to more sophisticated information systems, the advantages inherent in such personal relationships may be attenuated.^{7,8}

Several limitations should be noted. First, this study was based on 2 years of data, a relatively short period of time for a physician-patient relationship. This fact makes the findings particularly dramatic. Second, we defined only 3 continuity groups. The group that would have been labeled low site/high clinician continuity was not separated out because we believed that if individuals saw the same clinician, regardless of location, clinician continuity would be maintained. Third, because the groups were naturally existing groups, there may be other explanations for the observed effects.

The study's policy implications are particularly critical with the move toward managed care. Patient-physician relationships are important and have an impact on health outcomes. Providing a location for health care without clinician continuity may not be sufficient to ensure cost-effective care. □

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