ORIGINAL RESEARCH

Comparison of Resource Utilization and Clinical Outcomes between Teaching and Nonteaching Medical Services

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PURPOSE: To compare the resource utilization and clinical outcomes of medical care delivered on general internal medicine inpatient services at teaching and nonteaching services at an academic hospital.

METHODS: From February to October 2002, 2189 patients admitted to a 450-bed university-affiliated community hospital were assigned either to a resident-staffed teaching service (n = 1637) or to a hospitalist- or clinic-based internist nonteaching service (n = 552). We compared total hospital costs per patient, length of hospital stay (LOS), hospital readmission within 30 days, in-hospital mortality, and costs for pharmacy, laboratory, radiology, and others between teaching and nonteaching services.

RESULTS: Care on a teaching service was not associated with increased overall patient care costs ($5572 vs. $5576; P = .99), LOS (4.92 days vs. 5.10 days; P = .43), readmission rate (12.3% vs. 10.3%; P = .21), or in-hospital mortality (3.7% vs. 4.5%; P = .40). Mean laboratory and radiology costs were higher on the teaching service, but costs for the pharmacy and for speech therapy, occupational therapy, physical therapy, respiratory therapy, pulmonary function testing, and GI endoscopy procedures were not statistically different between the 2 services, and residents did not order more tests or procedures. Case mix and illness severity, as reflected by the distribution of the most frequent DRGs and mean number of secondary diagnoses per patient and DRG-specific LOS, were similar on the 2 services.

CONCLUSIONS: At our academic hospital, admission to a general internal medicine teaching service resulted in patient care costs and clinical outcomes comparable to those admitted to a nonteaching service. ***Journal of Hospital Medicine*** **2007;2:150–157.** *© 2007 Society of Hospital Medicine.*

KEYWORDS: resource utilization, clinical outcomes, patient care costs, teaching hospital, medical residents.

The most seriously ill medical patients are often admitted to an academic institution and taken care of on a teaching service.[1–4] Previously published reports have found that, despite substantial differences in case mix, being admitted to a teaching hospital is associated with reduced morbidity and risk-adjusted mortality for various conditions compared with receiving care delivered at a nonacademic hospital.[2,5–13] For example, among 248 major teaching, minor teaching, and nonteaching hospitals in New York state, Polanczyk et al. found that major teaching hospital status was an important determinant of outcomes in patients hospitalized with myocardial infarction, heart failure, or stroke.[1]

Some studies have noted that the high cost of care at teaching hospitals may offset these potential benefits.[1,6,12,13] In a retrospec-

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tive analysis of 2674 Medicare patients, Taylor et al. determined that adjusted mortality rates were usually lower and Medicare payments usually higher in major teaching hospitals than in for-profit hospitals.[13] However, in a study of 80,851 patients admitted to 39 hospitals in northeastern Ohio, Rosenthal et al. reported both lower hospital mortality *and* shorter length of hospital stay (LOS) of patients admitted to major teaching hospitals than of patients admitted to nonteaching hospitals.[12]

Understanding the differences in economic and clinical outcomes between teaching and nonteaching medical services is topical in today's health care environment. Comparisons across institutions are inherently cumbersome because of the number of variables, other than teaching status, that can potentially contribute to differences in outcomes. A study comparing teaching and nonteaching services within a single institution could provide results unencumbered by such confounding factors. Accordingly, we sought to compare the teaching service with the nonteaching service at our academic community hospital to see if there were notable differences between the 2 services in case mix, costs, and clinical outcomes.

PATIENTS AND METHODS

Our analysis was based on administrative data for 2189 patients who were admitted to a 450-bed university-affiliated community hospital from February through October 2002 and assigned to 1 of the 3 teaching services staffed by residents in internal medicine and a faculty attending ($n = 1637$) or to a nonteaching service staffed by hospitalists or clinic-based internists ($n = 552$).

Care on the nonteaching service was provided by 4 hospitalists and 12 clinic-based internists. The nonteaching service generally had no interns or residents but occasionally had a third- or fourth-year medical student on rotation. Care on the teaching services was provided under the supervision of 5 hospitalists and 18 clinic-based internists. The day-to-day clinical decisions on the teaching services were made by the upper-level resident (PGY-2 or -3) assigned to the particular service, with the attending physicians acting in a supervisory role. Four of the 5 hospitalists rotated between nonteaching and teaching services. Cross-coverage for teaching services was provided by other residents (by a night float team that rotated monthly), whereas a night attending only provided coverage for the nonteaching service. Patient handoffs occurred more commonly on the nonteaching service, where attendings rotated every 1-2 weeks compared with the teaching services, where interns and residents rotated monthly and attendings changed every 2-4 weeks.

All admissions to the medical services were screened and approved by either the chief medical resident or a designated faculty member who carried the departmental admission pager. Patients were randomly allocated to the respective teams based on patient load, in accordance with ACGME- and residency program–imposed limits, rather than according to patient diagnoses. Differences between groups in severity of illness were minimized by limiting levels of acuity and including only patients admitted to the medical ward and not to the intensive care, coronary care, or intermediate care units. Patients on both model services were admitted to geographically shared wards with the same nursing staff and other ancillary personnel. All residents and faculty had similar access to hospital resources such as academic meetings, clinical protocols, practice-based guidelines, and quality improvement initiatives.

The main outcome measures were total hospital costs; LOS; hospital readmission within 30 days; in-hospital mortality; number of tests and procedures ordered; and pharmacy, laboratory, radiology, and procedural costs and costs for physical, speech, occupational, and respiratory therapy consultations. Financial data for patient care excluding physician fees were based on actual direct and indirect costs and were estimated using an activity-based system (Transition Systems, Inc., Eclypsis Corporation, Boca Raton, FL). Department-specific costs represented actual variable costs and did not include indirect (overhead) costs. Hospital length of stay was defined as the number of days from the time a patient was admitted to the general medicine service to the day discharged from the hospital, even if the patient was transferred to another service before discharge. Hospital readmission for the same primary diagnosis within 30 days after discharge was used to compare the quality of care on the 2 types of services.

We assessed the case mix on the 2 services by comparing the distribution of the 10 most frequent diagnosis-related groups (DRGs) in the data set, plus angina, arrhythmia, and hypertension combined into a single category (Table 1). The chi-square test was used to test differences between the 2 services in the proportion of each DRG. To obtain

TABLE 1
Demographics of Patients Admitted to Medicine Teaching and Nonteaching Services

Variable	Teaching service	Nonteaching service	P Value
Number of patients	1637	552	—
Mean age ± SD (years)	67.1 ± 19.2	67.5 ± 18.3	0.64
Men (%)	760 (46.4)	276 (50)	0.15
Deaths (%)	61 (3.7)	25 (4.5)	0.40
Mean number of comorbidities per patient ± SD	6.7 ± 4.2	6.7 ± 4.3	0.99
Insurance (%)			0.12
Commercial	352 (21.5)	109 (17.8)	
Medicare	1095 (66.9)	374 (67.8)	
Medicaid	77 (4.7)	31 (5.6)	
Self-pay	93 (5.7)	24 (4.4)	
Others	20 (1.2)	14 (2.5)	
Common diagnoses by DRG* (%)			
Community-acquired pneumonia	140 (8.6)	45 (8.2)	0.84
Gastrointestinal bleed†	89 (5.4)	30 (5.4)	1.00
Congestive heart failure	75 (4.6)	25 (4.5)	1.00
COPD	55 (3.4)	20 (3.6)	0.87
Metabolic disorders	45 (2.8)	28 (5.1)	**0.01**
CVA‡	61 (3.7)	11 (2.0)	0.07
Other respiratory infections	60 (3.7)	9 (1.6)	**0.03**
Gastroenteritis	42 (2.6)	17 (3.1)	0.62
Septicemia	41 (2.5)	15 (2.7)	0.91
Urinary tract infection	42 (2.6)	13 (2.4)	0.91
Angina, arrhythmia, or hypertension†	41 (2.5)	13 (2.4)	0.97

* Diagnosis-related group.
‡ Cerebrovascular accident.
† Conditions combined to create one group.

a surrogate index for case severity, the list of coexisting or comorbid conditions present at the time of admission was used to calculate the mean number of comorbidities per patient. The morbidity experience of the 2 patient populations was compared using the Student *t* test for 2 independent samples.

We compared the main outcome measures for teaching and nonteaching services using 3 analytic methods. First, the crude difference in total costs, service- and diagnosis-specific costs, and length of hospital stay and the unadjusted odds ratio for readmission, in-hospital mortality, and services ordered were calculated. The Student *t* test for 2 independent samples was used to compare total cost, LOS, and DRG-specific and service-specific costs. The chi-square test was used to compare readmission rate, in-hospital mortality, and number of services ordered. Second, we used multiple linear regression and logistic regression analyses to estimate the difference in the main outcome measures of the 2 medical services, adjusted for age, sex, insurance classification, number of comorbidities, and primary DRGs. The Wald test was used to obtain *P* values for testing differences between teaching and nonteaching services.

In observational studies, multiple linear regression models are commonly used to remove the effects of confounding factors. However, regression methods do not ensure the balance in the distribution of covariates, and imbalance becomes more problematic as the number of covariates increases. To manage the imbalance of case mix and other potential confounders, we used a propensity score method to balance confounding variables between the 2 groups.[17] Specifically, by performing logistic regression with the potential confounding variables as covariates, we estimated the propensity score or the probability of being assigned to the teaching services for each patient (Tables 2 and 3). The collection of multiple characteristics was collapsed into a single composite score called the propensity score, and this score was used as if it were the only confounding variable. Patients were stratified to quintiles based on their propensity score, and the balance of the distribution of each potential confounder in the 5 propensity strata was checked, and we estimated the overall difference between the 2 medical services with the weighted average of the strata-specific difference, where the weights were proportional to the stratum size. The *Z* test was used to derive *P* values for comparing the total hospital costs, LOS, and service-specific costs of the 2 medical services. The Mantel-Haenszel test was used to determine whether the 2 medical services had the same risk of readmission, death, and frequency of diagnostic or consultation services ordered. In all analyses we report *P* values without adjusting for multiple comparisons. The significance level of hypothesis testing was set at .05.

RESULTS

The study consisted of 2189 patients (1036 men) whose mean age was 67.2 years (SD = 19.0 years). Patient demographics and frequencies of various DRGs on the 2 services are shown in Table 1. The distribution of insurance classifications (eg, third-party payer, Medicare, Medicaid, private pay) wase comparable between teaching and nonteaching groups. No statistically significant differences between the 2 services in patient characteristics and distribution of the 10 most common DRGs in the data set were observed except for patients with "metabolic disorders" ($P = .01$) and "other respira-

TABLE 2
Unadjusted and Adjusted Differences in Costs and Length of Hospital Stay between Teaching and Nonteaching Services*

	Crude method			Multiple linear regression			Propensity score method		
Variable	Difference†	SE	*P* Value‡	Difference†	SE	*P* Value§	Difference†	SE	*P* Value¶
Overall costs	−4	341	0.99	61	310	.84	130	336	0.70
Length of hospital stay	−0.18	0.23	0.43	−0.13	0.22	.54	−0.08	0.23	0.73
Service-specific costs									
Laboratory	127	55	**0.02**	145	53	**.01**	148	55	**0.01**
Pharmacy	4	23	0.85	8	25	.76	12	23	0.61
Radiology	38	15	**0.01**	42	20	**.03**	42	15	**0.01**
Speech therapy	−0.1	0.8	0.95	−0.3	0.7	.64	−0.1	0.8	0.87
Physical therapy	−0.6	1.0	0.52	−0.7	1.0	.46	−0.7	1.0	0.46
Occupation therapy	−0.5	0.6	0.43	0.4	0.8	.57	0.5	0.6	0.41
Respiratory therapy	5	6	0.42	3	6	.56	4	6	0.47
Pulmonary function tests	0.002	0.1	0.99	−0.03	0.1	.80	−0.04	0.1	0.75
GI endoscopy	0.2	1.9	0.94	0.9	2.2	.70	0.6	1.9	0.73

* Covariates for multiple linear regression models and the propensity score methods were age (<65 vs. ≥65 years), sex, type of insurance (commercial, Medicare, Medicaid, self-pay), number of comorbidities (0, 1–4, 5–7, 8–10, or ≥11), primary DRGs (community-acquired pneumonia; gastrointestinal bleed; congestive heart failure; COPD; metabolic disorders; CVA; other respiratory infections; gastroenteritis; septicemia; urinary tract infection; and angina, arrhythmia, or hypertension).

† Teaching versus nonteaching.

‡ *P* values derived using the t test with unequal variances.

§ *P* values derived using Wald test.

¶ *P* values derived using the Z test.

TABLE 3
Unadjusted and Adjusted Odds Ratios for Readmission, In-Hospital Mortality, and Services Ordered on Teaching and Nonteaching Services*

	Crude method			Multiple linear regression			Propensity score method		
Variable	Odds ratio	SE	*P* Value†	Odds ratio	SE	*P* Value‡	Odds ratio	SE	*P* Value§
Readmission	1.22	0.19	.21	1.25	0.20	.17	1.26	0.20	.15
In-hospital mortality	0.82	0.20	.40	0.76	0.19	.28	0.82	0.20	.41
Service/consultant ordered									
Laboratory	1.89	0.92	.18	1.81	0.92	.24	1.88	0.92	.20
Pharmacy	0.74	0.83	.79	0.75	0.84	.80	1.02	1.14	.99
Radiology	1.07	0.15	.61	1.09	0.16	.58	1.09	0.15	.55
Speech therapy	1.18	0.23	.39	0.87	0.19	.53	1.07	0.21	.75
Physical therapy	0.99	0.10	.94	0.98	0.11	.86	1.01	0.10	.94
Occupation therapy	1.18	0.14	.17	1.14	0.15	.30	1.19	0.15	.17
Respiratory therapy	1.14	0.11	.19	1.16	0.13	.18	1.14	0.11	.19
Pulmonary function tests	0.97	0.24	.89	0.89	0.23	.65	0.90	0.22	.68
GI endoscopy	0.75	0.16	.18	0.79	0.19	.33	0.79	0.17	.27

* Covariates for logistic regression models and the propensity score methods were age (<65 versus ≥65 years), sex, type of insurance (commercial, Medicare, Medicaid, self-pay, other), number of comorbidities (0, 1–4, 5–7, 8–10, ≥11), primary DRGs (community-acquired pneumonia; gastrointestinal bleed; congestive heart failure; COPD; metabolic disorders; CVA; other respiratory infections; gastroenteritis; septicemia; urinary tract infection; angina, arrhythmia, or hypertension; other).

† *P* values derived using chi-square test.

‡ *P* values derived using Wald test.

§ *P* values derived using Mantel-Haenszel test.

TABLE 4
Unadjusted and Adjusted Differences in Costs and Length of Hospital Stay between Teaching and Nonteaching Services for Patients Cared for by Nonhospitalist Physicians

	Crude method			Multiple linear regression			Propensity score method		
Variable	Difference*	SE	*P* Value[†]	Difference	SE	*P* Value[‡]	Difference	SE	*P* Value[§]
Overall costs	59	424	.89	31	378	.93	94	410	.82
Length of hospital stay	−0.18	0.28	.52	−0.18	0.26	.49	−0.13	0.27	.63
Service-specific costs									
Laboratory	163	69	**.02**	157	66	**.02**	155	68	**.02**
Pharmacy	28	27	.30	26	30	.39	30	26	.25
Radiology	36	19	.06	37	23	.11	38	17	**.03**
Speech therapy	−0.2	1.0	.82	−0.8	0.9	.36	−0.53	0.97	.59
Physical therapy	−1.9	1.2	.11	−2.1	1.0	.03	−2.0	1.1	.07
Occupation therapy	−0.01	0.7	.99	−0.16	0.7	.81	−0.07	0.67	.92
Respiratory therapy	6.2	7.6	.42	3.1	7.9	.70	4.0	7.5	.60
Pulmonary function	−0.13	0.16	.39	−0.18	0.16	.25	−0.17	0.16	.28
GI endoscopy procedures	1.8	1.9	.33	1.5	2.1	.49	1.72	1.65	.30

Covariates for multiple linear regression models and propensity score methods were age (<65 vs. ≥65 years), sex, type of insurance (commercial, Medicare, Medicaid, self-pay), number of comorbidities (0, 1–4, 5–7, 8–10, or ≥11), primary DRGs (community-acquired pneumonia; gastrointestinal bleed; congestive heart failure; COPD; metabolic disorders; CVA; other respiratory infections; gastroenteritis; septicemia; urinary tract infection; and angina, arrhythmia, or hypertension).
* Teaching versus nonteaching.
[†] *P* values derived using t test with unequal variances.
[‡] *P* values derived using Wald test.
[Å] *P* values derived using Z test.

TABLE 5
Unadjusted and Adjusted Odds Ratios of Readmission, In-Hospital Mortality, and Services Ordered on Teaching and Nonteaching Services, for Patients Cared for by Nonhospitalist Physicians

	Crude method			Multiple linear regression			Propensity Score Method		
Variable	Odds ratio	SE	*P* Value*	Odds ratio	SE	*P* Value[†]	Odds ratio	SE	*P* Value[‡]
Re-admission	1.41	0.27	.07	1.43	0.28	.07	1.44	0.27	.06
In-hospital mortality	0.89	0.25	.67	0.83	0.25	.52	0.89	0.26	.68
Service/consultant ordered									.54
Laboratory	1.49	0.88	.50	1.30	0.82	.67	1.44	0.86	.85
Pharmacy	1.04	1.28	.97	0.78	0.98	.84	1.27	1.56	.91
Radiology	1.00	0.17	.97	0.97	0.17	.85	0.98	0.17	.79
Speech therapy	1.30	0.31	.27	0.87	0.24	.60	1.07	0.26	.93
Physical therapy	1.03	0.12	.81	1.00	0.13	1.00	1.01	0.12	.57
Occupation therapy	1.12	0.16	.44	1.06	0.17	.70	1.09	0.16	.34
Respiratory therapy	1.15	0.14	.24	1.16	0.15	.26	1.12	0.13	.10
Pulmonary function	0.69	0.20	.19	0.64	0.19	.13	0.63	0.18	.64
GI endoscopy procedures	0.96	0.31	.90	0.85	0.30	.64	0.86	0.28	

Covariates for logistic regression models and the propensity score methods include: age (<65 versus ≥65 years), sex, type of insurance (commercial, Medicare, Medicaid, self-pay, other), number of comorbidities (0, 1–4, 5–7, 8–10, ≥11), primary DRGs (community-acquired pneumonia; gastrointestinal bleed; congestive heart failure; COPD; metabolic disorders; CVA; other respiratory infections; gastroenteritis; septicemia; urinary tract infection; angina, arrhythmia, or hypertension; other).
* *P* values derived using chi-square test.
[†] *P* values derived using Wald test.
[‡] *P* values derived using Mantel-Haenszel test.

tory infections" (P = .03). The mean number of comorbidities was also comparable between teaching and nonteaching services (6.7 vs. 6.7; P = .99).

Care on the teaching service was not associated with a significant increase in overall costs per patient ($5572 vs. $5576, P = .99). Crude comparison of other main outcome measures showed that the LOS (4.92 vs. 5.10 days; P = .43), odds of readmission within 30 days (202/1637 vs. 57/552; P = .21), and odds of in-hospital mortality (61/1637 vs. 25/552; P = .40) were comparable for teaching and nonteaching services (Tables 2 and 3). Using multiple linear regression analysis, the estimated adjusted differences were only $61 ($P$ = .84) in overall costs and −0.13 days (P = .54) in LOS between teaching and nonteaching services. Estimated adjusted risk of readmission within 30 days was 25% higher (P = .17), and in-hospital mortality was 24% lower (P = .28) for patients treated on the medical teaching services. Using the propensity score method, the estimated difference between teaching and nonteaching services was $130 ($P$ = .70) in overall costs and −0.08 days (P = .73) in length of stay. Risk of readmission within 30 days was 26% higher (P = .15), and in-hospital mortality was 18% lower (P = .41) for the teaching service. Because the distributions of overall costs and length of stay were heavily skewed, we also performed statistical analyses using logarithm-transformed data on these 2 outcomes. The results using all 4 analytic methods showed that care on the teaching services was not associated with statistically significant differences in total hospital costs, LOS, risk of readmission, and in-hospital mortality.

Service-specific cost analyses showed that mean laboratory costs per patient ($937 vs. $810; P = .02) and mean radiology costs per patient ($134 vs. $96; P = .01) were higher for teaching services, whereas costs for the pharmacy ($233 vs. $229; P = .85) and for speech therapy ($2.4 vs. $2.4; P = .95), physical therapy ($6.6 vs. $7.2; P = .52), occupational therapy ($3.9 vs. $3.4; P = .43), respiratory therapy ($46 vs. $41; P = .42), pulmonary function testing ($0.4 vs. $0.4; P = .99), and GI endoscopy procedures ($5.9 vs. $5.8; P = .94) were not significantly different. A comparison of the number of consults or tests ordered indicated physicians on the teaching service did not order more radiology (1411/1637 vs. 471/552; P = .61), speech therapy (128/1637 vs. 37/552; P = .39), physical therapy (611/1637 vs. 207/552; P = .94), occupational therapy (369/1637 vs. 109/552; P = .17), respiratory therapy (893/1637 vs. 283/552; P = .19), or pulmonary function testing (75/1637 vs. 27/552; P = .89) consultations or GI endoscopy procedures (188/1637 vs. 65/552; P = .18). Inferential results derived by multiple linear regression and logistic regression analyses, as well as the propensity score method, all agreed with the results derived using crude comparisons and concluded that, except for laboratory and radiology costs, patients treated on the teaching services did not have higher service-specific costs or more therapies and consultations.

To remove the potential confounding effects of the 5 hospitalists who rotated between teaching and nonteaching services, we removed 875 patients (125 on the nonteaching and 750 on the teaching service) from the original data set who were cared for by these physicians, and repeated crude, multivariate, and propensity score analyses. In the data subset (Tables 4 and 5), laboratory costs remained higher on the teaching service, but the difference in radiology costs between teaching and nonteaching services seen in the total data set diminished and did not remain statistically significant when hospitalists were excluded from the analysis.

DISCUSSION

We found that care delivered on the resident-based teaching services at our academic community hospital was not associated with increases in overall costs, pharmacy costs, or consultative services ordered, although laboratory-related costs and radiology costs were slightly higher than for the nonteaching service. In addition, clinical outcomes were not significantly different between teaching and nonteaching services in terms of hospital length of stay, in-hospital mortality, and 30-day readmission rate.

Several previous interinstitutional studies have documented greater utilization of resources at academic medical centers as a tradeoff for improved clinical outcomes.[2,4,12,13] One frequently offered explanation for higher costs at teaching hospitals is the purported tendency of resident physicians to order more tests and consults and to more heavily rely on modern diagnostic and therapeutic modalities. Apart from the number of tests and procedures ordered, differences in administrative, personnel, and other nonshared costs may account for higher overall costs at teaching hospitals reported in earlier studies. These variables, however, did not differ in our comparison of teaching and nonteaching services within the same institution because they were equally shared.

Studies that have looked at the hospitalist experience at academic centers and community hospitals have demonstrated improved efficiency associated with the use of hospitalist physicians.[15–17] At the University of Chicago, hospitalist care was associated with lower costs and short-term mortality in the second year of hospitalist experience.[15,16] The authors suggested that disease-specific physician experience in the hospitalist model may lead to reduced resource consumption and improved patient outcomes. The focus of our study was not a comparison of hospitalist with nonhospitalist models. However, when we excluded patients cared for by hospitalist physicians from our costs, services, and outcomes analyses, laboratory costs remained the only significant difference between teaching and nonteaching services.

Other than teaching hospital status and use of hospitalist physicians, institutional characteristics that can potentially influence clinical outcomes include hospital size, location, ownership, case mix, access to on-site specialized diagnostic and therapeutic equipment, and availability of specialty services.[15,16] However, all these variables were identical in our study of teaching versus nonteaching services within the same community hospital, thereby allowing an uncontaminated estimation of the effect of teaching status on resource utilization and clinical outcomes. Although both teaching and nonteaching services were sometimes headed by attendings who participated in both models, teaching services differed notably in being run by resident team leaders with attendings performing a largely supervisory role.

We recognize several limitations of our study. Patients were quasirandomly triaged to teaching and nonteaching services according to patient loads without any consideration for diagnoses, comorbidities, or severity of illness. Therefore, it is quite possible there were unascertainable differences in disease severity and case mix between the teaching and nonteaching services. Notably, there was some discordance in the number of patients with nonpneumonia respiratory infection and the number with metabolic disorders assigned between the 2 services. However, 8 of the 10 most common primary diagnoses in the data set were similarly distributed between the 2 services, and the mean number of secondary diagnoses per patient was also not statistically different. More importantl we employed multiple regression analysis and a propensity score method to account for any imbalance in case mix and other potential confounders such as sex, age, and insurance classifications. These advanced statistical methods produced results similar to the unadjusted method and, hence, strengthen our conclusion that care delivered on the resident-based teaching services at our academic community hospital was not significantly associated with increases in overall patient care costs, LOS, readmission rate, or in-hospital mortality. Having hospitalist physicians on both teaching and nonteaching services may have had some effect on the practice patterns of other physicians, creating greater similarities than might have been expected otherwise. Data used in this study were obtained from only 1 academic institution, and caution should be exercised in extrapolating our findings to other settings unless substantiated by other studies.

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