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ORIGINAL RESEARCH

Do Hospitalists Affect Clinical Outcomes and Efficiency for Patients with Acute Upper Gastrointestinal Hemorrhage (UGIH)?

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BACKGROUND: Care by hospitalists has been associated with improved/similar clinical outcomes and efficiency. However, less is known about their effect on conditions dependent upon specialists for procedures/treatment plans. Our objective was to compare care for upper gastrointestinal hemorrhage (UGIH) patients attended by academic hospitalists and nonhospitalists.

METHODS: The study included 450 UGIH patients admitted to general medical services of 6 teaching hospitals. Outcomes included in-hospital mortality and complications (ie, recurrent bleeding, intensive care unit [ICU] transfer, decompensation, transfusion, reendoscopy, 30-day readmission). Efficiency was measured by hospital costs and length of stay (LOS).

RESULTS: Of 450 patients, 40% (177) were cared for by hospitalists with no differences between groups by endoscopic diagnosis, performance of early esophagogastroduodenoscopy (EGD), Rockall risk score, or Charlson comorbidity index. Unadjusted clinical outcomes between hospitalists and nonhospitalists were similar except for 2 outcomes: patients cared for by hospitalists were more likely to receive a transfusion (74% vs. 63%; $P = 0.02$) or be readmitted within 30 days (7.3% vs. 3.3%; $P = 0.05$). However, differences in adverse outcomes between providers were not seen after multivariable adjustments. Median LOS was similar for hospitalists and nonhospitalists (4 days; $P = 0.69$), but patients cared for by hospitalists had higher median costs ($7,359 vs. $6,181; $P < 0.01$). In multivariable analyses, LOS was similar (5.2 vs. 4.7 days; $P = 0.15$) and costs remained higher for the hospitalist-led teams ($P < 0.03$).

CONCLUSIONS: Despite having similar overall outcomes and LOS, costs were higher in UGIH patients attended by hospitalists. These results suggest that the academic hospitalist model may be tempered in patients requiring specialists for procedures or management. ***Journal of Hospital Medicine*** **2010;5:133–139.** *© 2010 Society of Hospital Medicine.*

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Acute upper gastrointestinal hemorrhage (UGIH) is one of the most common hospital admissions for acute care. Estimates indicate that 300,000 patients (100-150 cases per 100,000 adults) are admitted annually with an associated economic impact of $2.5 billion.[1–5] The current standard management of UGIH requires hospital admission and esophagogastroduodenoscopy (EGD) by a gastroenterologist for diagnosis and/or treatment. This management strategy results in a high consumption of hospital resources and costs.

Simultaneously, hospitalists have dramatically changed the delivery of inpatient care in the United States and are recognized as a location-driven subspecialty for the care of acute hospitalized patients, similar to emergency medicine. Currently there are 20,000 hospitalists, and more than one-third of general medicine inpatients are cared for by hospitalists.[6,7]

Previous studies have shown that hospitalist care offers better or comparable outcomes, with lower overall length of stay (LOS) and costs compared to traditional providers.[8–10] However, most of these studies were performed in single institutions, had weak designs or little-to-no adjustment for severity of illness, or were limited to 7 specific diseases (pneumonia, congestive heart failure [CHF], chest pain, ischemic stroke, urinary tract infection, chronic obstructive lung disease [COPD], and acute myocardial infarction [AMI]).[8]

Furthermore, less is known about the effect of hospitalists on conditions that may be dependent upon specialist consultation for procedures and/or treatment plans. In this study, gastroenterologists performed diagnostic and/or therapeutic endoscopy work as consultants to the attending physicians in the management of acute inpatient UGIH.

To explore the effects of hospitalists on care of patients with acute UGIH, we examined data from the Multicenter Hospitalist (MCH) trial. The objectives of our study were to compare clinical outcomes—in-hospital mortality and complications (ie, recurrent bleeding, intensive care unit [ICU] transfer, decompensation, transfusion, reendoscopy, 30-day readmission)—and efficiency (LOS and costs) in hospitalized acute UGIH patients cared for by hospitalists and nonhospitalists in 6 academic centers in the United States during a 2-year period.

Patients and Methods

Study Sites

From July 1, 2001 to June 30, 2003, the MCH trial[11–13] was a prospective, multicenter, observational trial of the care provided by hospitalists to patients admitted to general medical services at 6 academic medical institutions. There were 31,000 consecutive admissions to the general medical services of these participating sites: University of Chicago (Chicago, IL), University of Wisconsin Hospital (Madison, WI), University of Iowa (Iowa City, IA), University of California at San Francisco (San Francisco, CA), University of New Mexico (Albuquerque, NM), and Brigham and Women's Hospital (Boston, MA). The study was approved by the institutional review boards (IRBs) at each of the 6 participating institutions.

MCH Study Patients

Patients were eligible if they were admitted to the general medical services under the care of a hospitalist or nonhospitalist physician. Regardless of the admitting provider, each medical service was composed of rotating senior and junior resident physicians in all 6 sites. Furthermore, patients were 18 years of age or older, and were able to give consent themselves or had an appropriate proxy. Patients with minimental status score of $\leq$17 (out of 22), admitted under their primary care physician or to an inpatient gastroenterology service, or transferred from another hospital, were excluded. The MCH study was designed to study the outcomes and efficiency in patients admitted for CHF, pneumonia, UGIH, and end-of-life care.

Acute UGIH Patients

Within the MCH-eligible patients, we identified those with acute UGIH using the following International Classification of Diseases, 9th edition (ICD-9) codes assigned at discharge: esophageal varices with hemorrhage (456.0, 456.20); Mallory-Weiss syndrome (530.7); gastric ulcer with hemorrhage (531.00–531.61); duodenal ulcer with hemorrhage (532.00–532.61); peptic ulcer, site unspecified, with hemorrhage (533.00–533.61); gastrojejunal ulcer with hemorrhage (534.00–534.61); gastritis with hemorrhage (535.61); angiodysplasia of stomach/duodenum with hemorrhage (537.83); and hematemesis (578.0, 578.9). We also confirmed the diagnosis of UGIH by reviewing patient medical records for observed hematemesis, nasogastric tube aspirate with gross or hemoccult blood, or clinical history of hematemesis, melena, or hematochezia.[14,15]

Data

All data were obtained from the 6 hospitals' administrative records, patient interviews, and medical chart abstractions. Dates of admission and discharge, ICD-9 diagnosis codes, insurance type, age, race, and gender were obtained from administrative data. One-month follow-up telephone interviews assessed whether or not patient had any follow-up appointment or hospital readmissions. Trained abstractors from each site performed manual chart reviews using a standard data collection sheet. The ICD-9 code designation and chart abstraction methodology were developed prior to the initiation of the study to ensure consistent data collection and reduce bias.

The following data elements were collected: comorbidities, endoscopic findings, inpatient mortality, clinical evidence of rebleeding, endoscopic treatment or gastrointestinal (GI) surgery to control bleeding, repeat EGD, ICU transfer, decompensated comorbid illness requiring continued hospitalization, and blood transfusion (packed red cells,

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plasma, platelets). Clinical evidence of rebleeding was defined as either hematemesis or melena with decrease in hemoglobin of 2 g in 24 hours with or without hemodynamic compromise.[14,15] For the purpose of this study, "recurrent bleeding" was defined as clinical evidence of rebleeding, emergency GI surgery for control of UGIH, or repeat EGD before discharge. Furthermore, a composite endpoint termed "total complications" encompassed all adverse outcomes related to the UGIH hospitalization. The 30-day readmission variable was defined using readmission identified in administrative records and a 30-day follow-up phone call. To guard against recall bias, self-report data was only included for nonsite admissions.

We defined efficiency in terms of costs and LOS. Total hospital costs were measured using the TSI cost accounting system (Transition Systems, Inc., Boston, MA; now Eclipsys Corporation)[16,17] at 5 out of the 6 participating sites. TSI is a hospital cost accounting software system that integrates resource utilization and financial data already recorded in other hospital databases (such as the billing system, payroll system, and general ledger system).[17] Hospital LOS was defined as the number of days from patient admission to the general medicine service until patient discharge.

Provider Specialization: Hospitalists vs. Nonhospitalists

The study was designed as a natural experiment based on a call cycle. The hospitalist-led teams at each institution alternated in a 4-day or 5-day general medicine call cycle with teams led by traditional academic internal medicine attending physicians. All patients were assigned to teams according to their position in the call cycle without regard to whether the attending physician was a hospitalist or a nonhospitalist. Hospitalists are physicians whose primary professional focus is the general medical care of hospitalized patients.[18,19] As previously reported in a related MCH work,[11] a hospitalist was also defined as a provider who spends at least 25% of his or her time on an academic inpatient general medicine service. Nonhospitalist physicians were most often outpatient general internal medicine faculty or subspecialists, who attended 1 month per year. Physicians were classified as hospitalists or nonhospitalists according to the designations provided by each site.

UGIH-specific Confounders

From chart abstraction, we captured severity of illness, comorbidity, and performance of early EGD, variables that can confound analysis in UGIH. To capture severity of illness, a complete Rockall risk score was calculated for each patient. The complete Rockall uses 3 clinical variables (age, shock, and comorbidity) and 2 endoscopic variables (endoscopic diagnosis and stigmata of recent hemorrhage).[5,20] A complete Rockall score of ≤ 2 is considered low-risk for rebleeding or death following admission.[21,22] The accepted definition of low-risk is $<5\%$ recurrent bleeding and $<1\%$ mortality risk. A complete Rockall score of 3 to 5 is considered moderate-risk while ≥ 6 is considered high-risk. Comorbidity was measured using the Charlson comorbidity index.[23] Performance of early endoscopy, usually defined as endoscopy performed within 24 hours from presentation, was previously shown to decrease LOS and need for surgical intervention in patients with acute UGIH.[24,25] Documented times of presentation to the emergency department and time of endoscopy performance were collected to calculate for the rate of early endoscopy in our study population.

Statistical Analysis

All statistical analyses were performed using SAS Version 9.1 for Windows (SAS Institute, Cary, NC).

Differences in baseline demographic characteristics of patients and their endoscopic findings were compared between the 2 types of providers. Univariate analyses were also performed to compare the differences in adverse outcomes, LOS, and costs between patients cared for by hospitalists and nonhospitalists. Chi-square tests were used for categorical variables; while both Wilcoxon rank sum test and Student's *t* test were used in the analysis of continuous variables.

Next, we performed multivariable analyses to determine the independent association between hospitalist care and the odds of the patients having certain outcomes. However, to prevent overfitting, we only developed regression models for adverse outcomes that have at least 20% event rate.

Multivariable regression models were developed separately for LOS and costs. In contrast with the models on outcomes, analyses of LOS and costs were restricted to: (1) patients who were discharged alive; and (2) to cases with LOS and costs values within 3 standard deviations (SDs) of the mean because of the skewed nature of these data.

All models were adjusted for age, gender, race, insurance type, complete Rockall risk score, performance of early EGD, Charlson comorbidity index, and study site. Final candidate variables in the models were chosen based on stepwise selection, a method very similar to forward selection except that variables selected for the model do not necessarily remain in the model. Effects were entered into and then removed from the model in such a way that each forward selection step can be followed by 1 or more backward elimination steps. The stepwise selection was terminated if no further effect can be added to the model or if the current model was identical to the previous model. The stepwise selection model was generated using statistical criterion of alpha = 0.05 for entry and elimination from the model. Variables that can be a profound source of variation, such as study site and treating physician, were included in the model irrespective of their statistical significance.

To account for clustering of patients treated by the same physician, we used multilevel modeling with SAS PROC GLIMMIX (with random effects). For outcomes (categorical variables), we utilized models with logit-link and binomial-distributed errors. As for efficiency (continuous variables

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TABLE 1. Patient Characteristics, Rockall Risk Score, Performance of Early Endoscopy, and Endoscopic Findings by Admitting Service

Variable	Admitting Service: Hospitalist (n = 177)	Nonhospitalist (n = 273)	P
Age, years (mean ± SD)	62.8 ± 17.4	57.7 ± 18.5	**<0.01**
Male sex, n (%)	104 (58.8)	169 (61.9)	0.50
Ethnicity, n (%)			0.13
White	83 (46.9)	102 (37.4)	
African-American	34 (19.2)	75 (27.5)	
Hispanic	21 (11.9)	40 (14.7)	
Asian/Pacific Islander	24 (13.6)	29 (10.6)	
Others/unknown	15 (8.5)	27 (9.9)	
Insurance, n (%)			**<0.01**
Medicare	86 (48.6)	104 (38.1)	
Medicaid	15 (8.5)	33 (12.1)	
No payer	18 (10.2)	36 (13.2)	
Private	46 (26)	52 (19.1)	
Unknown	12 (6.8)	48 (17.5)	
Charlson Comorbidity Index (mean ± SD)	1.9 ± 1.6	1.8 ± 1.7	0.51
Complete Rockall, n (%)			0.11
Low-risk (0-2)	82 (46.3)	103 (37.7)	
Moderate-risk (3-5)	71 (40.1)	137 (50.2)	
High-risk (≥6)	24 (14.6)	33 (12.1)	
Early endoscopy (<24 hours)	82 (46.3)	133 (48.7)	0.62
Endoscopic diagnosis, n (%)*			
Erosive disease	88 (49.7)	149 (54.6)	0.31
Peptic ulcer disease	85 (48.0)	128 (46.9)	0.81
Varices	33 (18.6)	40 (14.7)	0.26
Mallory-Weiss tear	9 (5.1)	21 (7.7)	0.28
Angiodysplasia	9 (5.1)	13 (4.8)	0.88
GI mass	1 (0.6)	4 (1.5)	0.65
Normal	7 (4.0)	8 (2.9)	0.55
Admission hemoglobin values (mean ± SD)†	10.2 ± 2.9	10.2 ± 2.9	0.78

NOTE: Significant *P* values indicated by bold.
Abbreviations: GI, gastrointestinal; SD, standard deviation.
*Do not add up to 100% due to dual diagnoses.
†Data on hemoglobin values on admission were available only for 376 patients (134 patients cared for by hospitalists and 242 cared for by nonhospitalists).

TABLE 2. Univariate Analyses of Outcomes and Efficiency by Admitting Services

Outcomes, n (%)	Admitting Service: Hospitalist (n = 177)	Nonhospitalist (n = 273)	P
Inpatient mortality	4 (2.3)	1 (0.4)	0.08
Recurrent bleeding*	20 (11.3)	29 (10.6)	0.88
Endoscopic therapy	43 (24.3)	60 (22.0)	0.57
ICU transfers	23 (13)	24 (8.8)	0.20
Decompensated comorbidities that required continued hospitalization	26 (14.7)	41 (15.0)	0.92
Any transfusion	131 (74.0)	172 (63.0)	**0.02**
Total complications†	139 (78.5)	196 (71.8)	0.11
30-day all-cause readmissions	13 (7.3)	9 (3.3)	**0.05**
Efficiency‡	**Hospitalist (n = 164)**	**Nonhospitalist (n = 259)**	***P***
LOS, days			
Mean ± SD	4.8 ± 3.5	4.5 ± 3.0	0.30
Median (interquartile range)	4 (3–6)	4 (2–6)	0.69
Total costs, U.S. $			
Mean ± SD	10,466.66 ± 9191.00	7926.71 ± 6065.00	**<0.01**
Median (interquartile range)	7359.00 (4,698.00–12,550.00)	6181.00 (3744.00–10,344.00)	**<0.01**

NOTE: Significant *P* values are indicated by bold.
Abbreviations: EGD, esophagogastroduodenoscopy; GI, gastrointestinal; ICU, intensive care unit; LOS, length of stay; SD, standard deviation.
*Recurrent bleeding was defined as clinical evidence of rebleeding, emergency GI surgery and repeat EGD before discharge.
†Total complications is a composite endpoint of in-patient mortality, recurrent bleeding, endoscopic treatments to control bleeding, ICU transfer, decompensate comorbid illness requiring continued hospitalization, and blood transfusion.
‡Only 423 patients were used in the resource use (efficiency) analysis. A total of 27 patients were excluded because of inpatient mortality (n = 5) and those with more than 3SD of population mean in terms of costs and LOS (n = 22).

with skewed distribution), the multivariable analyses used a generalized linear model with log-link and assuming gamma-distributed errors.

Results

Patient Characteristics and Endoscopic Diagnoses

Out of 31,000 patients, the study identified a total of 566 patients (1.8%) with acute UGIH (Table 1). However, 116 patients transferred from another hospital were excluded as their initial management was provided elsewhere, giving a final study sample of 450 patients. Overall, there are 163 admitting physicians from 6 sites, with 39 (24%) classified as hospitalists and 124 (76%) as nonhospitalists. Forty-two percent (177/450) of patients were cared for by hospitalists. Compared to nonhospitalists, patients admitted to the hospitalist service were older (62.8 vs. 57.7 years, $P < 0.01$) and with third-party payor mix differences ($P < 0.01$). However, there were no statistical differences between patients attended by hospitalists and nonhospitalists with regard to Complete Rockall risk score, Charlson comorbidity index, performance of early endoscopy, and mean hemoglobin values on admission. Upper endoscopy was performed in all patients with distribution of the 3 most common diagnoses being similar ($P > 0.05$) between hospitalists and nonhospitalists: erosive disease (49.7% vs. 54.6%), peptic ulcer disease (PUD) (48% vs. 46.9%), and varices (18.6% vs. 14.7%).

Clinical Outcomes

Between hospitalists and nonhospitalists, unadjusted outcomes were similar ($P > 0.05$) for mortality (2.3% vs. 0.4%), recurrent bleeding (11% vs. 11%), need for endoscopic therapy (24% vs. 22%), ICU-transfer and decompensation (15%

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TABLE 3. Regression Model Estimates for Efficiency by Admitting Service

	Treatment Provider		
Efficiency	Hospitalist (n = 164)	Nonhospitalist (n = 259)	P
Adjusted length of stay, days (mean ± SD)	5.2 (4.9–5.6)	4.7 (4.5–5.0)	0.15
Adjusted total cost, U.S. $ (mean ± SD)	9006.50 (8366.60–9693.60)	7504.10 (7069.90–7964.20)	**0.03**

NOTE: Significant *P* value indicated by bold. Adjusted means reported in days or dollars. These are antilogs of the mean values for provider type, adjusted for all covariates. Models are adjusted for age, gender, race, insurance, complete Rockall risk score, early EGD, Charlson comorbidity index score, and study site. By utilizing random effects in the regression models, we accounted for the effects of clustering on the physician level.
Abbreviations: EGD, esophagogastroduodenoscopy ; SD, standard deviation.

vs. 15%), as well as an overall composite measure of any complication (79% vs. 72%) (Table 2). However, the hospitalist-led teams performed more blood transfusions (74% vs. 63%, $P = 0.02$) and readmission rates were higher (7.3% vs. 3.3%, $P = 0.05$).

Because of the low event rate of certain adverse outcomes (<20%), we were only able to perform adjusted analyses on 4 outcomes: need for endoscopic therapy (odds ratio [OR], 0.82; 95% confidence interval [CI], 0.49–1.37), ICU transfer and decompensation (OR, 0.82; 95% CI, 0.45–1.52), blood transfusion (OR, 1.30; 95% CI, 0.82–2.04), and any complication (OR, 1.18; 95% CI, 0.71–1.96). Since outcome differences disappeared after controlling for confounders, the data suggest that overall care provided by hospitalists and nonhospitalists might be equivalent—even in certain outcomes that we were unable to substantiate using multivariable methods.

Efficiency

Efficiency, as measured by LOS and costs, are presented both as means and medians in univariate analyses in Table 2. Median LOS was similar for hospitalist-led and nonhospitalist-led teams (4 days). Despite having similar LOS, the median costs of acute UGIH in patients cared for by hospitalists were higher ($7,359.00 vs. $6,181.00; $P < 0.01$).

After adjusting for demographic factors, Rockall risk score, comorbidity, early EGD, and hospital site, LOS remained similar between the 2 groups. On the other hand, the adjusted cost for UGIH patients cared for by hospitalists and nonhospitalists persisted, with hospitalist care costs $1,502.40 more than their nonhospitalist counterparts (Table 3).

Discussion

This is the first study that has looked at the effect of hospitalists on clinical outcomes and efficiency in patients admitted for acute UGIH, a condition highly dependent upon another specialty for procedures and management. This is also one of only a few studies on UGIH that adjusted for severity of illness (Rockall score), comorbidity, performance of early endoscopy—patient-level confounders usually unaccounted for in prior research.

We show that hospitalists and nonhospitalists caring for acute UGIH patients had overall similar unadjusted outcomes; except for blood transfusion and 30-day readmission rates. Unfortunately, due to the small number of events for readmissions, we were unable to perform adjusted analysis for readmission. Differences between hospitalists and nonhospitalists on blood transfusion rates were not substantiated on multivariable adjustments.

As for efficiency, univariable and multivariable analyses revealed that LOS was similar between provider types while costs were greater in UGIH patients attended by hospitalists.

Reductions in resource use, particularly costs, may be achieved by increasing throughput (eg, reducing LOS) or by decreasing service intensity (eg, using fewer ancillary services and specialty consultations).[26] Specifically in acute UGIH, LOS is significantly affected by performance of early EGD.[27,28] In these studies, gastroenterologist-led teams, compared to internists and surgeons, have easier access to endoscopy, thus reducing LOS and overall costs.[27,28]

Similarly, prior studies have shown that the mechanism by which hospitalists lower costs is by decreasing LOS.[8–10,29] There are several hypotheses on how hospitalists affect LOS. Hospitalists, by being available all day, are thought to respond quickly to acute symptoms or new test results, are more efficient in navigating the complex hospital environment, or develop greater expertise as a result of added inpatient experience.[8] On the downside, although the hospitalist model reduces overall LOS and costs, they also provide higher intensity of care as reflected by greater costs when broken down per hospital day.[29] Thus, the cost differential we found may represent higher intensity of care by hospitalists in their management of acute UGIH, as higher intensity care without decreasing LOS can translate to higher costs.

In addition, patients with acute UGIH are unique in several respects. In contrast to diseases like heart failure, COPD, and pneumonia, in which the admitting provider has the option to request a subspecialist consultation, all patients with acute UGIH need a gastroenterologist to perform endoscopy as part of the management. These patients are usually admitted to general medicine wards, aggressively resuscitated with intravenous fluids, with a nonurgent gastroenterology consult or EGD performed on the next available schedule.

Aside from LOS being greatly affected by performance of early EGD and/or delay in consulting gastroenterology, sicker patients require longer hospitalization and drive LOS and healthcare costs up. It was therefore crucial that we accounted for severity of illness, comorbidity, and performance of early EGD in our regression models for LOS and costs. This approach allows us to acquire a more accurate

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estimate on the effects of hospitalist on LOS and costs in patients admitted with acute UGIH.

Our findings suggest that the academic hospitalist model of care may not have as great of an impact on hospital efficiency in certain patient groups that require nonurgent subspecialty consultations. Future studies should focus on elucidating these relationships.

Limitations

This study has several limitations. First, clinical data were abstracted at 6 sites by different abstractors so it is possible there were variations in how data were collected. To reduce variation, a standardized abstraction form with instructions was developed and the primary investigator (PI) was available for specific questions during the abstraction process. Second, only 5 out of the 6 sites used TSI accounting systems. Although similar, interhospital costs captured by TSI may vary among sites in terms of classifying direct and indirect costs, potentially resulting in misclassification bias in our cost estimates.[17] We addressed these issues by including the hospital site variable in our regression models, regardless of its significance. Third, consent rates across sites vary from 70% to 85%. It is possible that patients who refused enrollment in the MCH trial are systematically different and may introduce bias in our analysis.

Furthermore, the study was designed as a natural experiment based on a rotational call cycle between hospitalist-led and nonhospitalist-led teams. It is possible that the order of patient assignment might not be completely "naturally random" as we intended. However, the study period was for 2 years and we expect the effect of order would have averaged out in time.

There are many hospitalist models of care. In terms of generalizability, the study pertains only to academic hospitalists and may not be applicable to hospitalists practicing in community hospitals. For example, the nonhospitalist comparison group is likely different in the community and academic settings. Community nonhospitalists (traditional practitioners) are usually internists covering both inpatient and outpatient responsibilities at the same time. In contrast, academic nonhospitalists are internists or subspecialists serving as ward attendings for a limited period (usually 1 month) with considerable variation in their nonattending responsibilities (eg, research, clinic, administration). Furthermore, academic nonhospitalist providers might be a "self-selected group" by their willingness to serve as a ward attending, making them more "hospitalist-like." Changes and variability of inpatient attendings may also affect our findings when compared to prior work. Finally, it is also possible that having residents at academic medical centers may attenuate the effect of hospitalists more than in community-based models.

Conclusions/Implications

Compared to nonhospitalists, academic hospitalist care of acute UGIH patients had similar overall clinical outcomes. However, our finding of similar LOS yet higher costs for patients cared for by hospitalists support 1 proposed mechanism in which hospitalists decrease healthcare costs: providing higher intensity of care per day of hospitalization. However, in academic hospitalist models, this higher intensity hypothesis should be revisited, especially in certain patient groups in which timing and involvement of subspecialists may influence discharge decisions, affecting LOS and overall costs.

Due to inherent limitations in this observational study, future studies should focus on verifying and elucidating these relationships further. Lastly, understanding which patient groups receive the greatest potential benefit from this model will help guide both organizational efforts and quality improvement strategies.

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