**BRIEF REPORT**

# Comparing Academic and Community-Based Hospitalists

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Disclosure: Nothing to report.

In 2006, hospitalist programs were formally introduced at both an academic and community hospital in the same city providing an opportunity to study the similarities and differences in workflows in these two settings. The data were collected using a time-flow methodology allowing the two workflows to be compared quantitatively. The results showed that the hospitalists in the two settings devoted similar proportions of their workday to the task categories studied. Most of the time was spent providing indirect patient care followed by direct patient care, travel, personal, and other. However, after adjusting for patient volumes, the data revealed that academic hospitalists spent significantly more time per patient providing indirect patient care (Academic: $54.7 \pm 11.1$ min/patient, Community: $41.9 \pm 9.8$ min/patient, $p < 0.001$). Additionally, we found that nearly half of the hospitalists' time at both settings was spent multitasking. Although we found subtle workflow differences between the academic and community programs, their similarities were more striking as well as greater than their differences. We attribute these small differences to the higher case mix index at the academic program as well greater complexity and additional communication hand-offs inherent to a tertiary academic medical center. It appears that hospitalists, irrespective of their work environment, spend far more time documenting, communicating and coordinating care than they do at the bedside raising the question, is this is a necessary feature of the hospitalist care model or should hospitalists restructure their workflow to improve outcomes? *Journal of Hospital Medicine* 2010;5:349–352. © *2010 Society of Hospital Medicine.*

KEYWORDS: quality improvement, communication, patient safety.

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In 2006, after introducing formal hospitalist programs at both an academic hospital and an affiliated community teaching hospital, we conducted a time study to gain insight into the effect of adopting a community model in an academic environment. This evaluation was conducted to identify similarities and differences between the 2 programs and to highlight opportunities for process and quality improvement. The hospitalist case mix index (CMI) was higher at the academic center (1.3) than at the community center (1.1). At both institutions documentation and most order entry were completed on paper, while lab and test results were electronically available. Both hospitalist programs were nonteaching services with day shifts staffed from 7:00 AM to 7:00 PM. At the academic center, a single hospitalist staffed the service for 7 days in a row with an average daily census of 10 patients. At the community hospital, 2 hospitalists carried the service, alternating days as the primary admitter. These hospitalists each carried an average census of 13 patients for 6 days in a row with staggered start/stop dates to ensure service continuity. The years of experience as a practicing hospitalist were similar between the 2 programs (median 4 years and range 1-10 years for both programs); all hospitalists completed an internal medicine residency.

## Methods

A paper-based tool was used to collect data at 1-minute intervals into 5 major categories validated through trial observation, content focus groups, and expert opinion. The 5 categories were Direct Patient Care, Indirect Patient Care, Travel, Personal, and Other (Table 1). Communication, a subcategory of Indirect Patient Care, was further classified by the job-profession category and communication modality of the individual(s) interacting with the hospitalist. The tool allowed for more than 1 task category to be tracked at a time in order to capture multitasking. Three trained industrial engineers shadowed 9 different hospitalists during the day shifts, between 2 and 5 shifts per hospitalist, gathering approximately 355 hours of observational data over the 8 weeks of the study; 4 weeks at each hospital. Weekend and night shift data were not collected due to observer availability. Results for each setting were reported as the mean and standard deviation percentage of physician time observed for each task category. The results were also reported as the mean and standard deviation volume adjusted time per patient for each task category. The adjustment was made by dividing physician time by the number of patient encounters for that observation. Comparative analyses were

**TABLE 1. Hospitalist Work Categories and Definitions**

| Category | Definition |
|---|---|
| Direct patient care | Interviewing patient, examining patient, performing procedure on patient, family meeting |
| Indirect patient care | Subcategories listed below |
|   Documentation | Writing rules, filling out forms, dictating |
|   Orders | Writing paper orders in patient chart, entering orders in CPOE |
|   Reviewing records | Looking up medical records in either electronic or paper chart |
|   Medical references | Reviewing text books or using computer to consult UpToDate, do literature search, review Micromedix, or use personal digital assistant (PDA) to look up similar information |
|   Other indirect patient care | Looking for paper chart, forms, procedural items or work space; waiting for page return, computer to lead, etc |
|   Communication | Subcategories listed below |
|     Nurse/tech | Nurse or medical technologist |
|     Case manager | Case manager or social worker |
|     Primary care physician | Talking with the patient's primary care physician |
|     Inpatient physician | Specialist attendings, fellows, residents, medical students, other hospitalists |
|     Other staff | Pharmacist, therapist, nurse practitioner, physician assistant, unit clerk |
|       Phone | On the phone (attribute of Communication) |
|       Email | Emailing or text paging (attribute of Communication) |
|       In person | Face to face discussion (attribute of Communication) |
| Personal | Lunch, restroom, calls |
| Travel | Walking between units |
| Other | Meetings, administrative activities |

Abbreviation; CPOE, computerized physician order entry.

calculated using a *t*-test with a significance level of 0.05 and confidence intervals were reported at a 95% interval. Since this project was a quality improvement initiative analyzing the introduction of a new clinical service, Institutional Review Board (IRB) approval from our institution was not required.

## Results

Hospitalist time allocations at the 2 programs were comparatively similar (Table 2). At the academic center, hospitalists spent the majority of their time providing indirect patient care (69.8%, CI: 66.3-73.3%), followed by direct patient care (13.1%, CI: 11.2-14.9%), with the remaining time distributed among travel, personal, and other administrative duties. Likewise, the community hospitalists spent the majority of their time providing indirect patient care (68.7%, CI: 63.0-74.5%), followed by direct patient care (16.7%, CI: 14.1-19.4%), with travel, personal, and administrative duties completing the day. Additionally, the percent of time spent multitasking, defined as more than 1 task category observed at the same time, was strikingly similar between the 2 groups (Academic: 47.6% ± 16.5%, Community: 47.9% ± 9.8%).

While the difference in total percent of time spent on direct patient care was statistically significant ($P = 0.03$), the values converged after adjusting for the differences in average daily census (Table 3). On average, both the academic and community hospitalists spent approximately 10 minutes per patient per day interacting face to face with the patient and/or family (10.0 ± 2.9 minutes and 10.1 ± 3.6 minutes respectively, $P = 0.89$). However, after volume adjusting, other workflow differences became statistically significant,

**TABLE 2. Percent of Total Time Spent**

| | Academic (%) | | Community (%) | | |
|---|---|---|---|---|---|
| | Mean | Stdev | Mean | Stdev | P Value |
| Direct patient care | 13.8 | 4.1 | 17.2 | 6.3 | 0.032 |
| Indirect patient care | 68.2 | 8.0 | 68.0 | 13.2 | 0.756 |
|   Documentation | 15.4 | 3.3% | 22.0 | 6.2 | 0.000 |
|   Orders | 6.3 | 1.5 | 4.7 | 1.6 | 0.011 |
|   Community Rev records | 21.3 | 5.0 | 21.7 | 6.2 | 0.000 |
|   Medical refs | l.5 | 0.8 | 0.6 | 0.6 | 0.000 |
|   Other indirect patient care | 2.0 | 1.3 | 2.6 | 1.6 | 0.210 |
|   Communication | 21.7 | 4.2 | 16.5 | 4.7 | 0.000 |
|     Nurse/tech | 5.4 | 2.0 | 5.3 | 2.8 | 0.895 |
|     Care manager | 2.8 | 1.8 | 3.4 | 1.7 | 0.229 |
|     Primary care physician | 1.1 | 1.2 | 1.1 | 1.1 | 0.818 |
|     Inpatient physician | 12.5 | 3.9 | 6.7 | 2.6 | 0.000 |
|     Other staff | 6.4 | 9.7 | 2.3 | 1.2 | 0.029 |
| Personal | 4.1 | 2.4 | 2.5 | 1.8 | 0.029 |
| Travel | 4.4 | 1.2 | 3.9 | 1.0 | 0.311 |
| Other | 9.5 | 8.9 | 8.4 | 17.4 | 0.850 |

primarily in indirect patient care (Academic: 54.7 ± 11.1 minutes/patient, Community: 41.9 ± 9.8 minutes/patient, $P < 0.001$). The academic hospitalists spent more time writing orders (4.6 ± 1.3 minutes/patient vs. 2.8 ± 1.1 minutes/patient, $P < 0.001$), looking up and reviewing medical reference materials (1.1 ± 0.6 minutes/patient vs. 0.3 ± 0.4 minutes/patient, $P < 0.001$), and communicating with other providers (20.5 ± 7.7 min/patient vs. 11.1 ± 3.1 min/patient, $P < 0.001$) than their community hospitalist counterparts. Nearly half the time that the academic hospitalists spent communicating was dedicated to speaking with other

## TABLE 3. Volume Adjusted Time Spent (minutes/patient)

| | Academic | | Community | | |
|---|---|---|---|---|---|
| | Mean | Stdev | Mean | Stdev | P Value |
| Dir pt care | 10.0 | 2.9 | 10.1 | 3.6 | 0.890 |
| Indirect pt care | 50.1 | 8.4 | 40.5 | 9.8 | 0.000 |
| Documentation | 11.3 | 2.7 | 13.1 | 3.9 | 0.101 |
| Orders | 4.6 | 1.3 | 2.8 | 1.1 | 0.000 |
| Rev records | 15.6 | 4.0 | 13.0 | 4.8 | 0.069 |
| Medial refs | 1.1 | 0.6 | 0.3 | 0.4 | 0.000 |
| Other pt care | 1.5 | 1.0 | 1.5 | 1.0 | 0.833 |
| Communication | 16.0 | 3.8 | 9.7 | 2.8 | 0.000 |
| Nurse/tech | 3.9 | 1.4 | 3.1 | 1.6 | 0.102 |
| Case manager | 2.0 | 1.3 | 2.0 | 1.0 | 0.950 |
| Prim care physician | 0.8 | 0.9 | 0.7 | 0.7 | 0.547 |
| Inpatient physician | 9.2 | 3.5 | 4.0 | 1.6 | 0.000 |
| Other staff | 4.6 | 6.8 | 1.4 | 0.7 | 0.049 |
| Personal | 3.0 | 1.8 | 1.5 | 1.0 | 0.002 |
| Travel | 3.2 | 0.9 | 2.3 | 0.6 | 0.001 |
| Other | 6.8 | 6.0 | 4.4 | 8.4 | 0.306 |

physicians (9.2 ± 3.5 minutes/patient); more than double that of the community hospitalists (4.0 ± 1.6 minutes). Additionally, the academic hospitalists spent more time speaking with pharmacists (0.7 ± 0.6 minutes vs. 0.1 ± 0.2 minutes, $P = 0.001$).

## Discussion

In 2006, O'Leary et al.[1] demonstrated that academic hospitalists spend approximately 20% of their time engaged in direct patient care. Our results are consistent with these data and further expand these findings to a community setting. Although we found subtle workflow differences between the academic and community programs, their similarities were more striking than their differences. We suspect that these differences can be largely attributed to the higher CMI at the academic program as well as the greater complexity and additional communication hand-offs inherent to this tertiary academic medical center. For example, at the academic medical center, medicine admissions were screened by a medicine triage resident and subsequently handed off to a hospitalist. In most cases, this system did not preclude the need to speak directly with the emergency department (ED) attending, adding a layer of complexity that did not exist in the community hospital. Finally, in contrast to the community hospital, there was little comanagement at the academic medical center, necessitating frequent transfers to and from medical and subspecialty services.

It appears that hospitalists, irrespective of their work environment, spend far more time documenting, communicating, and coordinating care than at the bedside. It is unclear whether this represents a desirable outcome of hospitalists' role as managers of complex hospital stays or inefficient and ineffective effort that should be mitigated through care delivery redesign. Further research to optimize hospital information management, streamline care processes and eliminate low value-added effort is clearly needed.

Another notable finding of our study is that hospitalists spend roughly half of their time performing more than 1 work category at the same time deemed as "multitasking."[2] The prevalence and effects of multitasking are well-characterized in emergency medicine and likely apply to hospitalists.[3,4] Fractured attention due to multitasking may hamper communication, jeopardize care handoffs, and increase risk for medical errors and litigation.[4–6] While it is likely that multitasking is inherent to the practice of hospital medicine, it is unclear how this could be mitigated or better facilitated. Perhaps this could be done through structured communication and information management. This too merits further investigation.

Lastly, this study found that it takes approximately an hour of a hospitalist's time each day to manage 1 patient's care. This in and of itself, is very important from the standpoint of both billing and workload. In today's professional services fee model, there are a number of components that contribute to the level of service that a hospitalist can bill. One of those components is time, specifically the time spent counseling and/or coordinating care, which as this study suggests, dominates a hospitalist's workday. It is therefore critical that hospitalists accurately and consistently document the amount of time they spend with each patient and specifically describe the counseling and/or activities to coordinate care. Additionally, recognizing how much time is required for a hospitalist to care for a patient has important workload implications. If we assume that it takes approximately an hour per patient and a typical workday is around 11 hours after subtracting personal time, then it would be reasonable to expect that a single hospitalist should have, on average, 11 patient encounters per day. This number is, of course, completely dependent on organizational factors such as a specific hospital's support systems and the mix of admissions, follow-ups, and discharges on that service.

Our study has several limitations. The time study occurred at 2 hospitals, in 1 mid-sized Midwestern city, and the results may not be generalizable to other settings. However, the congruence of our findings with those of O'Leary et al.[1] suggests that our results maintain external validity. Second, at the time of the study the 2 programs were relatively new and workflows were still evolving. Additionally, the academic and community hospitalist programs were under unified management and 2 of the surveyed hospitalists worked at both programs. This may have artificially homogenized the work patterns observed at both programs. Finally, observing hospitalist activities exclusively during the weekday daytime shifts has the potential to bias the results. However, the night and weekend duties and responsibilities of the 2 programs differed significantly, which would have made it very difficult to derive meaningful comparisons for those observations.

## Conclusion

We found that hospitalists in both academic and community settings spend the majority of their time multitasking and engaged in indirect patient care. Further studies are

necessary to determine the extent to which this is a necessary feature of the hospitalist care model and whether hospitalists should restructure their workflow to improve outcomes.

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revision received 2 April 2010; accepted 8 April 2010.

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