Internal Medicine Residents' Time Study: Paperwork Versus Patient Care

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Abstract

Background Multiple factors affect residency education, including duty-hour restrictions and documentation requirements for regulatory compliance. We designed a work sampling study to determine the proportion of time residents spend in structured education, direct patient care, indirect patient care that must be completed by a physician, indirect patient care that may be delegated to other health care workers, and personal activities while on an inpatient general practice unit.

Methods The 3-month study in 2009 involved 14 categorical internal medicine residents who volunteered to use personal digital assistants to self-report their location and primary tasks while on an inpatient general practice unit.

Results Residents reported spending most of their time at workstations (43%) and less time in patient rooms (20%). By task, residents spent 39% of time on indirect patient care that must be completed by a physician, 31% on structured education, 17% on direct patient care, 9% on indirect patient care that may be delegated to other health care workers, and 4% on personal activities. From these data we estimated that residents spend 34 minutes per patient per day completing indirect patient care tasks compared with 15 minutes per patient per day in direct patient care.

Conclusions This single-institution time study objectively quantified a current state of how and where internal medicine residents spend their time while on a general practice unit, showing that residents overall spend less time on direct patient care compared with other activities.

Editor's note: The online version of this article contains the Multidimensional Work Task Classification List used in this study.

Background

Direct patient care, structured education, and clinical documentation are required activities in residents' clinical education.^{1,2} Clinical documentation and other paperwork

demands are increasing,³ and the Accreditation Council for Graduate Medical Education limited duty hours for residents.⁴ Use of the electronic medical record (EMR), where a patient's previous admissions, clinic notes, and diagnostic studies are documented, has also become increasingly prevalent⁵ in medical decision making, with a corresponding increase in required documentation for regulatory compliance. Thus, it is imperative to have objective documentation regarding residents' time expenditure.

A recent survey showed 68% of internal medicine residents reported spending more than 4 hours per day on documentation, and 39% reported spending more than 4 hours per day in direct patient care.⁶ Another study used an independent observer to evaluate a redesign initiative in an internal medicine residency, finding that the redesign group spent more time in educational activities, more time teaching, less time in indirect patient care, and a similar amount of time in direct patient care compared with the traditional group.⁷ We designed an objective study to determine internal medicine resident time spent on tasks while on service on a general practice unit.

Methods

Setting

Our internal medicine inpatient care model involves teams of 1 attending physician, 1 senior resident, 2 interns, and 1

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medical student. Each intern provides care to an average of 7 patients. Senior residents directly supervise the daily work of interns. Daily work hours extend over an 11-hour period on average. Every fourth night, residents and interns take a short call until 10:00 PM, when night float residents assume duties until 7:00 AM. The night float residents present their new admissions during morning faculty rounds and receive feedback on their medical decision making. Inpatient documentation is done on paper and later scanned into the EMR upon patient discharge; only the discharge summary is documented electronically. The Henry Ford Health System institution's Institutional Review Board reviewed and approved this study.

Participants

A total of 17 categorical internal medicine residents were invited to participate in the study based on their rotation through the general practice unit from September to November 2009. Implied consent was assumed with agreement to participate; formal written consent was not obtained. The study covered both day and night shifts daily.

Data Collection

The participating residents used personal digital assistants (PDAs) to self-report their location and tasks while on the inpatient unit. A multidimensional work task classification list was created by the chief medical residents based on their knowledge of tasks completed by residents while on an inpatient general practice unit. Direct observation of the residents occurred to ensure the task list contained appropriate selections. Based on additional input from the program director and the vice president for medical education, the tasks within the list were divided into 5 categories: structured education (SE); direct patient care (DPC); indirect patient care that must be completed by a physician (IPC-P); indirect patient care that may be delegated to other health care workers (IPC-O); and personal activities (P). The complete task list and examples of categories are provided as online supplemental material.

The task list was incorporated into PDAs containing Quetech's SelfStudy+ work sampling software (SelfStudy+ Version 4, Quetech Ltd, Waterloo, ON, Canada). The PDAs generated an audio signal on average every 20 minutes (range, 15–30 minutes) at random times to trigger the residents to select their location and primary task at that time. Random time generation was selected to capture all tasks that might not occur on a regular basis and to minimize the possibility of altered behavior because the resident would be expecting the PDA alert at a specific time. If residents failed to enter the data at signal cue because of patient care or inconvenience, they were

encouraged to input the information later into the PDA, using a manual override function to minimize missing data.

Data Analysis

Data were collected during 84 days, with residents carrying their PDA for 6 days for their entire shifts. On completion of each resident's data collection period, the data were imported into Microsoft Excel (Redmond, WA), and a Quetech Excel add-in was used for data analysis. The software includes templates that allow for easy statistical analysis. We used the summary of each task and the number of times that task was selected to determine the amount of time a resident spent on each task.

Results

Fifteen residents volunteered to participate, and 1 withdrew because use of the PDA was "stressful." A total of 10 residents participated in the daytime studies (all postgraduate year 1 [PGY-1]), and 4 in the night shift studies (PGY-2 and PGY-3); they provided direct clinical care and no supervision because PGY-1 residents do not work on our night float service. A total of 2243 data entries were recorded by the PDAs: 1791 entries (80%) from daytime residents and 452 entries (20%) from the night float residents. Missed data were not counted and are not available for analysis.

At the workstation, residents spent most of that time reviewing and completing EMR (43%) and paperwork (25%). They spent 19% of the time in discussion with their teaching faculty, senior resident, or consultants, and spent a smaller proportion of time using the Internet and calling consultants, the laboratory, and radiology about test results. In the hallway, residents spent nearly 50% of the time rounding and 25% writing orders. In patients' rooms, residents spent most of the time obtaining history (22%) and examining patients (31%), and less time counseling patients (14%; TABLE 1).

Resident time by task category is shown in the FIGURE. In using these data to estimate daily time on task categories for an 11-hour day with 7 patients per resident, we found daytime residents spent 34 minutes per patient per day on IPC-P tasks, most of which involved review and documentation of patient medical records and paperwork; 32 minutes per patient per day on SE, which included attending conferences and rounding/discussion of patient management with the team and with consultants, and only 15 minutes per patient per day on DPC tasks (TABLE 2). During the 4.8 hours daily at the workstation, residents spent 68% of the total time dedicated to EMR use. The 2.9 hours a resident spent in the hallway was also divided among many tasks, including 9% of the time completing and faxing paperwork. This translates to more than 3.5 hours per day

TABLE 1 RESIDENT TIME PER LOCATION IN HOURS

	Workstation, No. (%)	Hallway, No. (%)	Patient Room, No. (%)	Conference Room, No. (%)	Off the Unit, No. (%)
Daytime residents, h (n = 10) ^a	4.3 (39)	3.4 (31)	2.1 (19)	0.8 (7)	0.4 (4)
Night float residents, h (n = 4) ^a	6.4 (58)	1.5 (14)	2.2 (20)	0 (0)	0.8 (8)
Total, h (N = 14)^b	4.8 (44)	2.9 (26)	2.1 (19)	0.6 (5)	0.6 (5)

^aNote: Percentages are estimated based on an 11-hour day.

^bThe totals are averaged based on the percentage of participants in daytime and night float.

(32% of an 11-hour work day) spent on paperwork (electronic and paper).

Discussion

This study provides objective evidence on how internal medicine residents spend their time while on a general practice unit. As expected, residents spent most of their time outside of the patient room at workstations and in the hallways.

Although a 1994 study⁸ found internal medicine residents spent most time in direct patient care, later studies show decreasing time in direct patient care and increasing documentation requirements. A 1998 study⁹ reported that internal medicine residents spent most time in indirect patient care activities. Other time studies in the 1990s agreed that most residents performed tasks that could be done by other professionals,^{1,10} with one study noting that internal medicine rotations had higher documentation

requirements than specialty rotations.¹¹ Recent studies reported that residents spend an increasing amount of time on clinical documentation for patient care.^{3,12}

Although computerized integration of medical records varies by institution, EMR use is becoming an integral component of patient care and documentation. The use of technology should serve the patient-physician relationship by decreasing time spent confirming the patient's history and increasing time to counsel and provide medical care and health education to the patient.

From an education standpoint, it is undesirable to decrease resident time in structured education and direct patient care to accommodate EMR/paperwork.¹ Therefore, EMR systems and hospitals need continued feedback on inefficiencies of care that are added by regulations or the EMR system itself. Documentation must be considered a skill for which residents must be educated and demonstrate competency. Developing a curriculum to improve residents' documentation efficiency is another potential solution for shifting time back to the patient.

Our study limitations include a single-site intervention and single-specialty focus, which limit its generalizability. In addition, our program uses a hybrid paper and electronic EMR system; using a complete EMR might produce different results. Another limitation is that multitasking was not able to be captured. The participating residents entered only the primary task into the PDA. Also, residents self-reported tasks and input these activities directly into the PDA. There was no component of direct observation, which could have reduced bias and improved accuracy, or negatively affected the observation by means of the Hawthorne effect. Finally, in calculating the time spent in minutes per patient per day on the various task categories, we presumed that the first-year residents were providing care for 7 patients, but we did not obtain the exact census for participating residents.

FIGURE PERCENTAGE OF TIME RESIDENTS SPENT IN TASKS BY CATEGORY

Proportion of time residents spent in structured education (SE), direct patient care (DPC), indirect patient care that must be completed by a physician (IPC-P), indirect patient care that may be delegated to other health care workers (IPC-O), and personal activities (P) while on an inpatient general practice unit.

Conclusions

This study objectively quantified how internal medicine residents spend time on a general practice unit. In our study,

TABLE 2 TIME RESIDENTS SPENT ON TASK CATEGORIES IN HOURS

	IPC-P, No. (%)	SE, No. (%)	DPC, No. (%)	IPC-O, No. (%)	P, No. (%)
Daytime residents, h (n = 10) ^a	3.9 (36)	3.7 (34)	1.8 (16)	1.2 (11)	0.3 (3)
Night float residents, h (n = 4) ^a	5.3 (48)	2 (18)	2.2 (20)	0.7 (6)	0.8 (8)
Total, h (N = 14)^b	4.3 (39)	3.3 (30)	1.9 (17)	1.1 (10)	0.4 (4)

Abbreviations: DPC, direct patient care; IPC-O, indirect patient care that may be delegated to other health care workers; IPC-P, indirect patient care that must be completed by a physician; P, personal activities; SE, structured education.

^a Note: Percentages are estimated based on an 11-hour day.

^b The totals are averaged based on the percentage of participants in daytime and night float.

residents spent more time per day on indirect patient care than on structured education and spent the least amount of time on direct patient care. As our program is implementing a full EMR in the era of duty hour reform, this information can be used to advocate for additional support and resources.

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