SURVEY OF NONPHYSICIAN TASKS PERFORMED BY MEDICINE RESIDENTS AT A MUNICIPAL HOSPITAL

Katherine L. Dolan, MBA, Fred Rosner, MD, and Kevin Spiegel, MBA
Jamaica, New York

In June 1988, the New York State Hospital Review and Planning Council approved major revisions in the state hospital code (Part 405). Among the most controversial of these changes were the recommendations of the Bell Commission concerning limitations on resident work hours, new emergency service requirements, and enhancements in ancillary staffing. The ancillary staffing mandated by the new code regulations for teaching hospitals include the provision at all times of intravenous services, phlebotomy services, messenger services, transport services, nurses aides, housekeeping services, and other ancillary support in a manner sufficient to meet patient care needs and to prevent adverse impact on the delivery of medical and nursing care.

The intent of the new health code requirements is to reduce or eliminate many of the nonphysician tasks performed by residents so as to effectively reduce their workload. We conducted a survey of Medicine residents at Queens Hospital Center to assess the amount of time they presently devote to nonphysician tasks, their perceptions of the need for ancillary staff to relieve them of the burden of these nonphysician tasks, and their evaluation of the effectiveness of a recently instituted intravenous therapy team.

Key words • nonphysician tasks • ancillary staff • medical residents • intravenous therapy teams

BACKGROUND

The death of a young woman named Libby Zion at a major New York City teaching hospital resulted in enormous publicity in the mass media, a grand jury investigation, and the appointment of a special New York State advisory commission headed by Bertram Bell, MD. The grand jury made five recommendations concerning what they perceived as inadequate supervision and instruction of house staff, sleep deprivation and overwork, and informational overload.[1]

In response to the grand jury report, the Bell Commission issued a series of recommendations to the New York State Department of Health, the most controversial of which was the reduction of resident work hours to a maximum of 80 hours per week, with a work schedule of no more than 24 consecutive hours. The Bell Commission recommendations have been incorporated into the New York State Health Code. Among the requirements is that all teaching hospitals at

From the Planning and Professional Services, Queens Hospital Center, and the Department of Medicine, Queens Hospital Center Affiliation of the Long Island Jewish Medical Center, and Health Sciences Center, State University of New York at Stony Brook. Requests for reprints should be addressed to Ms Katherine L. Dolan, Queens Hospital Center, 82-68 164th St, Jamaica, NY 11432.

TABLE 1. ESTIMATES BY DIRECTORS OF MEDICINE IN HHC* FACILITIES OF PERCENT OF RESIDENT TIME SPENT ON NONPHYSICIAN TASKS

Task	PGY†1	PGY 2	PGY 3
Blood drawing	13	5	1
IV insertion	10	6	3
Electrocardiogram	4	2	1
Patient transport	7	2	1
Specimen transport	7	2	1
Other	10	4	3
Totals	44	21	10

* Health and Hospitals Corporation
† Postgraduate year

all times provide ancillary support, such as intravenous insertions, blood drawing, messenger, transport, housekeeping, and other services to meet patient care needs. A basic assumption of the new regulations is that residents are currently performing a substantial number of nonphysician tasks that can be shifted to appropriate ancillary staff. In attempting to meet the new work schedule limitations for residents, hospitals have to make their residents more efficient. This goal can be achieved only by identifying categories of ancillary staff that are appropriate and, in this era of health personnel shortages, that are available to be hired.

Few studies have been conducted to examine the relationship between the nonphysician tasks performed by residents and ancillary staffing. These studies have all looked at residents on Medicine programs, but have used different data collection techniques, defined nonphysician tasks differently, and have been conducted at different types of hospital facilities.

OBSERVATIONAL STUDIES

Nearly three decades ago, Payson et al[2] performed a 2-week time study of two interns (postgraduate year 1) on the Medical Service at the Grace-New Haven Hospital. Approximately 1 hour per day was spent on intravenous therapy tasks, while 1 to 3 hours daily were devoted to ancillary services such as "walking, waiting, telephoning, form writing, messenger and delivery work, and laboratory work." This study used an observation methodology and was conducted at a voluntary hospital.

Two decades ago, Gillanders and Heiman[3] reported a study from San Francisco of five interns at each of three hospitals (university, county, and public health service) who were followed for 1 week with observers recording their activities. The data indicated that 10% of the interns' time was spent on blood drawing, intravenous therapy, and other procedures; 5.5% of their time was spent on ancillary activities (walking, searching, running errands). There was little variation in these activities at the three hospitals. However, interns at the county public hospital spent an additional 8.5% of their time doing blood counts, staining slides, and other laboratory work, compared with 0.5% and 1.0% at the other two facilities. An additional 20% of the interns' time at all three hospitals was devoted to charting and filling out forms.

In a more recent 1988 study at New York Hospital, a large voluntary facility, observers followed interns in postgraduate year 1 for 1 week. They found that they perform 64 blood drawings and intravenous therapies during an average week but transport only one patient per week to another part of the hospital (personal communication, Hays JG, October 1988).

SURVEYS

An internal Health and Hospitals Corporation survey of the clinical directors of service at its acute care facilities was conducted in August 1987 (New York City Health and Hospitals Corporation, unpublished data). The Director of Internal Medicine at each of these public hospitals was asked to estimate the time that residents at each postgraduate year level spend performing blood drawing, intravenous insertions, transport, and other nonphysician tasks. These directors collectively estimated that time devoted to nonphysician tasks was 44% for interns in postgraduate year 1, 21% for interns in postgraduate year 2, and 10% for interns in postgraduate year 3. The directors also estimated that blood drawing and intravenous therapy were the most time-consuming of the tasks for interns in postgraduate years 1 and 2 (Table 1).

Given the wide variation in these methodologies, we decided to conduct a study at Queens Hospital Center, an urban public teaching hospital. We wanted to extend the findings of the previous studies and to explore differences between the amount of nonphysician tasks performed at the different postgraduate levels of training. We also wanted to compare results in a municipal (public) hospital with the experience at voluntary facilities. Furthermore, we were interested in seeing whether the residents' self-report of how much time they spent performing the various nonphysician tasks was consistent with the results of observation methodologies or the opinions of experts in the field.

Finally, as the previous studies have consistently identified intravenous therapy as an activity which consumes a large portion of the residents' time, we

TABLE 2. RESIDENT TIME SPENT ON NONPHYSICIAN TASKS DURING MOST RECENT WORKDAY (N = 84)

Task	Average Number of Times Task Performed During Workday	Estimated Average Time in Minutes Per Task	Total Minutes Spent Performing Task
Blood drawing	11	12	132
IV insertion	11	13	143
Patient transport	2	21	42
Specimen/blood transport	2	12	24
EKG	1	13	13
Urinalysis	1	10	10
Obtain lab result	2	9	18
Obtain x-ray result	2	14	28
Total			410

Average work day = 17.8 hours
% of time spent on nonphysician tasks = 38%

wanted to assess the effect of introducing an intravenous therapy team on the residents' workload and perceptions.

MATERIALS AND METHODS

The Queens Hospital Center is a 543-bed municipal facility centrally located within New York City's Borough of Queens and operated by the Health and Hospitals Corporation of the City of New York. Located on a 20-acre site, the center has 18 000 admissions, 100 000 emergency room visits, and 250 000 outpatient visits annually. Under a contractual affiliation initiated in 1964, the Long Island Jewish Medical Center, a voluntary tertiary care university-affiliated community medical center, assumed responsibility for all medical staffing and medical education programs at the Queens Hospital Center. The medical residency training program is fully integrated with house staff rotations through both the municipal and voluntary medical centers.

A two-page questionnaire was distributed in August 1988 to all medical residents with their paychecks. In addition, follow-up visits to the inpatient units and to resident conferences were conducted to ensure an appropriate response rate. The questionnaire asked residents to estimate the number of times in their most recent workday that they performed phlebotomy, intravenous line insertions, patient transport, specimen transport, electrocardiogram, urinalysis, and obtained a laboratory result and radiology report. In addition, the residents were asked to estimate the average time it took to complete each of these tasks. Respondents were also asked to rank order the ancillary services which would reduce their workload, such as expansion of the intravenous team, phlebotomy services, messenger services, transport services, ward clerk coverage, or other support staff.

In April 1987, a team of four licensed practical nurses was assigned to the Department of Medicine to perform intravenous line insertions, blood drawing, and finger stick glucose tests daily from 4 PM to midnight. The residents were also asked to rate this intravenous therapy team and to suggest additional functions that might be carried out by members of the team.

RESULTS

Of the questionnaires distributed both with the paychecks and at departmental conferences, a total of 96 responses were received. Four incomplete questionnaires returned by residents and eight questionnaires from physicians' assistants and medical students were eliminated, leaving a net total of 84 completed questionnaires, representing 95% of the medicine house staff. All questionnaires were returned anonymously, with only the postgraduate level of training as an identifying symbol.

According to the respondents, their most recent workday (including on-call time) averaged almost 18 hours. The estimates by the medical residents of the number of times they performed nonphysician tasks and the average time it took to complete each of these tasks are shown in Table 2. These survey results indicate that, on average, medical residents spend 38% of their time performing nonphysician tasks. There is wide variation among interns in postgraduate years 1, 2, and 3 and between medical ward service and emergency room assignments.

When analyzed by postgraduate year level of training, it was evident that residents in the different

TABLE 3. NUMBER OF NONPHYSICIAN TASKS PERFORMED DURING MOST RECENT WORKDAY BY POSTGRADUATE YEAR LEVEL

Task	PGY* 1 (n=24)	PGY* 2 (n=22)	PGY* 3 (n=4)	No Level Identified (n=17)	ER (n=4)	Total (N=71)
Blood drawing	12.8	4.4	5.5	16.2	15.5	10.6
IV therapy	12.1	8.0	3.4	14.7	13	10.9
Patient transport	1.0	.4	.7	1.4	11.2	1.6
Specimen/blood transport	1.0	1.1	1.5	1.4	11.2	1.8
EKG	1.1	1.25	1.5	1.0	3.0	1.1
Urinalysis	1.6	.4	.6	.6	1.2	.8
Laboratory result	.7	1.1	0	.76	16	1.7
X-ray	1.9	1.4	5.2	.2	11.5	2.1
Length of day	21.9	13.2	34	18.5	12.0	17.8

* Postgraduate year

TABLE 4. RESIDENTS' ASSESSMENT OF FUNCTIONS THAT MIGHT BE ADDED TO INTRAVENOUS THERAPY TEAM (N=71)

Expanded Task/Role	Number of Times Suggested
Blood gasses	45
Subclavians/CVPs	11
IVs in the foot	6
Hang blood transfusions	3
Femoral phlebotomy	1
Deliver stat lab specimens	1
Draw peak-trough drug levels	1

years spent their time on different nonphysician tasks. Table 3 illustrates that in year 1, interns performed more blood drawing and intravenous therapy than residents in years 2 or 3. Applying analysis of variance to these data, the differences for year 1 and year 2 were significant for both blood drawing and intravenous therapy ($P < .01$ in all cases). For residents in postgraduate year 3, the low number of responses prevented the data from being statistically significant ($P > .05$). The medical residents assigned to the emergency room also performed significantly more tasks, presumably because of the different type of patient care activity occurring in the emergency room (a high number of diagnostic tests and large numbers of patients) than on the medical wards.

The estimated average time in minutes per task was analyzed by postgraduate year level and by medical service/emergency room assignment location. There were no significant variations in the length of time per task between postgraduate levels. Individual tasks, however, in the emergency room were more frequent and less time consuming than on the inpatient units. This finding may be due to the configuration of the emergency room which has a contiguous STAT laboratory and radiology suite to which the physicians frequently bring laboratory requisitions or transport patients for treatment.

The residents were also asked to rank order the ancillary staffing enhancements that would reduce their workload. The majority (70%) listed an intravenous therapy team as their first priority, with ward clerks (11%) and phlebotomy (10%) as their second and third priorities.

The intravenous therapy team, currently functioning on only one shift per day, received very high ratings from the medicine house staff. Response time was rated excellent by 73%, good by 24%, and poor by only 3% of the respondents. Even higher ratings (84% excellent, 17% good) were given to the intravenous therapy team's technical competence and their ability to assist in reducing residents' workload.

The residents were also asked for their assessment of functions that might be added to the intravenous therapy team. Seventy-one residents identified seven functions that could be added to the team's responsibilities. The most frequently noted function was blood gases, identified by 45 residents, or 63% of the total suggestions. Subclavian line insertions or central vein line placements were suggested by 15% of respondents, and insertion of intravenous lines in the foot was suggested by 8% of respondents. These results are presented in Table 4.

Respondents were also asked to respond to the open-ended question, "What suggestions do you have

for improving the intravenous therapy team's usefulness?'' Expansion of the team's hours and staffing were identified by 84% of respondents. Procedural changes, such as increasing the number of assignment sessions per shift, modifying ordering policies, and ensuring that the team members directly inform the residents when the requested tasks are not completed, were suggested by several respondents. Six percent suggested that the pay for team nurses be improved to reduce turnover, while 4% suggested that additional training be provided.

DISCUSSION

Our results confirm earlier studies which indicate that residents in Medicine spend a large portion of their time on tasks that could be performed by ancillary staff. Consistent with all previous studies, intravenous therapy and blood drawing were found to be the most time consuming of the ancillary tasks identified. Our results closely parallel the estimates provided by the directors of Medicine at the 11 acute care facilities operated by the Health and Hospitals Corporation of New York City.

In addition to validating previous studies, our results provide new data on the variation in nonphysician tasks performed by residents in the various levels of postgraduate training. Furthermore, the study found that medical residents assigned to the emergency room perform more tasks than their counterparts on the medical inpatient units.

These findings may be useful as the Bell Commission requirements are implemented. The large volume of emergency room nonphysician activity performed by medical residents indicates that special emphasis should be placed on ancillary staff enhancements in the emergency room. The large portion of time spent by medical residents, particularly in years 1 and 2, on intravenous therapy and on blood drawing indicates that supplemental staffing in these areas are among the most critical of the mandated Bell Commission ancillary staffing enhancements. Finally, the medical residents' strong endorsement of the recently introduced intravenous therapy team provides an effective way to reduce house staff workload.

Acknowledgments

Survey is from the Queens Hospital Center Affiliated with the Long Island Jewish Medical Center, Jamaica, New York, the New York City Health and Hospitals Corporation, and the Health Sciences Center, State University of New York at Stony Brook.

Literature Cited

1. Asch DA, Parker RM. The Libby Zion Case. *N Engl J Med.* 1988;318:771-775.

2. Payson HE, Gaenslen EC, Stargardter FL. Time study of an internship on a university medical service. *N Engl J Med.* 1961;264:439-443.

3. Gillanders W, Heiman M. Time study comparisons of three intern programs. *J Med Educ.* 1971;46:142-149.