Rational Staffing of Hospital Nursing Services by Functional Activity Budgeting

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THE SALARIES OF NURSES are the single largest item in the budget of most hospitals. Yet in this day of utilization review and cost controls, the utilization of nursing services is not measured, and justification for the billions of dollars spent annually on nursing services is, for the most part, a matter of precedent, anecdote, and interdepartmental negotiation. In this paper, the reasons for this paradox are discussed, and some recommendations for the future are made.

When one reviews the nursing literature over the past 40 years, it is apparent that two problems have received an overwhelming amount of discussion: (*a*) how many nurses are needed to staff a hospital; that is, how big should the nursing budget be? and (*b*) how should it be staffed on a day-to-day basis for the variations in patients' needs?

Measuring Need for Services

In 1937, the National League of Nursing Education published a recommendation for nurse staffing based on a study of 50 hospitals (*1*). The league's committee recommended that 3.5 nursing hours per patient day was an appropriate guideline. This figure has been used up to the present as the basis for determining the nursing budget of many hospitals. The majority of the hospitals not using the 3.5-hours guideline staff each nursing unit according to some modification of this amount based on local precedents (*2,3*). Most nursing units operate with a fixed number of budgeted positions and, therefore, the size of the nursing staff theoretically remains stable from day to day. In reality, settling on a fixed number of positions insures that the number of staff present will vary significantly from day to day. The need to provide for weekends off, sick leave, vacations, scheduling preferences, and the like leads to large daily variations in the staff actually available on a given unit (*4–6*).

The need for nursing services varies significantly from day to day in a hospital providing care for the acutely ill (*6–9*). Variations in the patients' needs and fluctuations in the availability of staff do not necessarily coincide. The hope that patient needs could be predicted and the level of staffing adjusted appropriately led to attempts to develop techniques to measure patient needs for nursing services.

The pioneering effort in the late 1950s was Connor's work on a patient classification system (*10*). He showed that certain patient variables such as ability to ambulate, state of continence, ability to feed oneself, and the like could be used to classify patients into three basic categories reflecting three levels of need for nursing services. Furthermore, from direct observations he showed that, on the average, each category of patient required a replicated number of nursing care hours. Each patient's needs could be categorized according to preset guidelines, and the number of nurses needed that day could be calculated. If a pool of nurses is available, then staff can be scheduled flexibly among nursing units to respond to the patient's needs.

These studies were also among the first to demonstrate that nursing need does not correlate well with the hospital's patient census, which was the basic premise of the National League for Nursing Education's recommendation as well as the guideline most commonly used

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today. Since 1960, there have been many studies of patient classification, numerous modifications have been proposed, and many attempts have been made to use such a system (*11*). Although no data are available, it is unlikely that more than a small percentage of hospitals use a patient classification system, or any other advanced system, to determine their nursing workload. What is wrong?

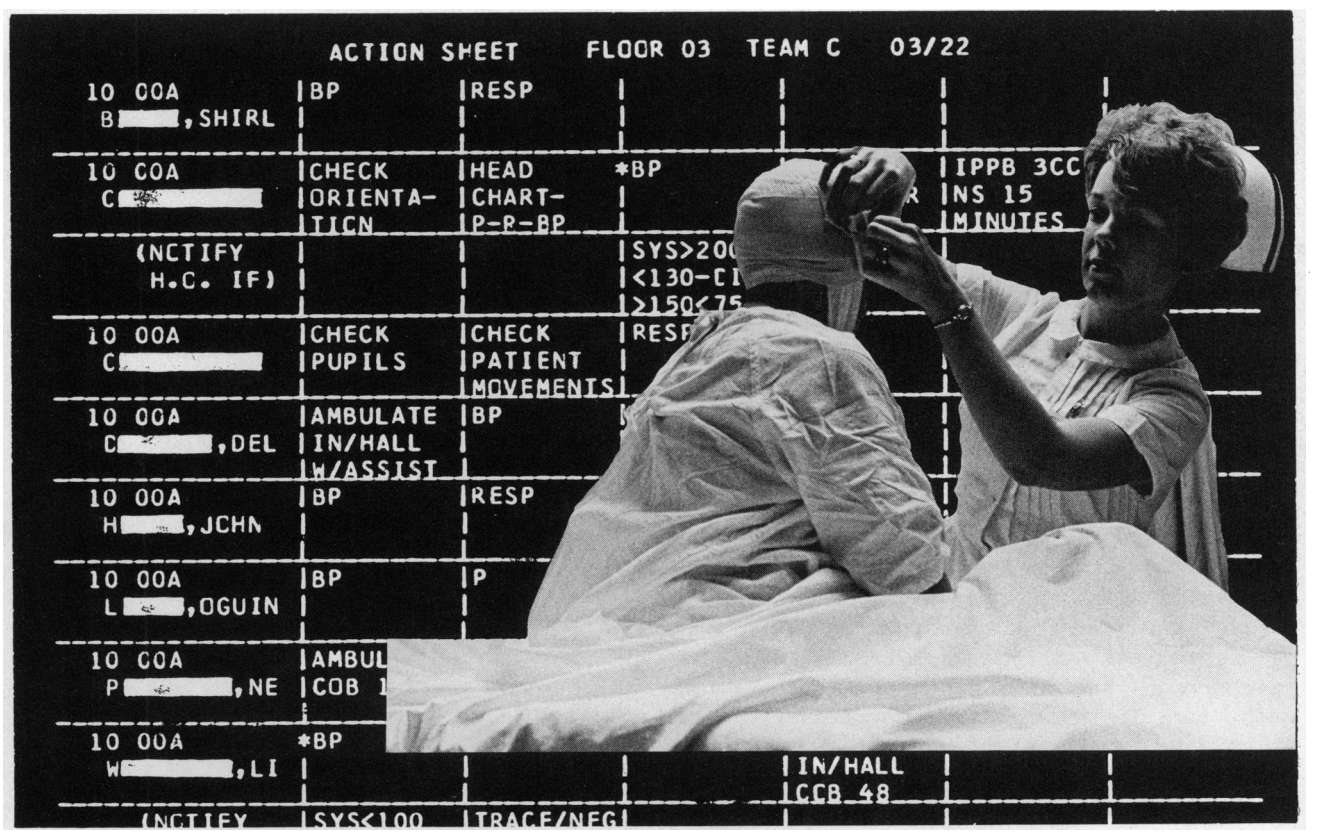
What Do Nurses Do?

One must first get back to the basics of what nurses do. Table 1, one way to look at their duties, is the classic oft-repeated list used in work-sampling studies of nursing activities. As has been shown many times, nurses spend about one-third of their time giving direct patient or bedside care and about two-thirds doing other things, largely administrative or clerical chores. Most nursing classification schemes build on such data to determine their quantitative indices of care. The direct care given to specific categories of patients is observed, and some overhead amount for indirect care is added, based on the observed distribution of direct and indirect care. The total hours of nursing care needed are thereby calculated.

Taking the work sampling approach creates the first problem inherent in classification schemes—they tend to formalize what exists. The data in table 1 are taken from a study of a medical ward at the Johns Hopkins Hospital. Apparently, relatively little time was spent in nontask-oriented activities such as patient assessment, patient education, psychological support, talking to the patient, discharge planning, and the like. Nurses claim that they do not have time to perform these functions, and therefore the nursing services are understaffed. At the same time, physicians complain that their orders are not always carried out as they desire and, in fact, studies

Table 1. Work sampling study of registered nurses' activities in a medical nursing unit

Activity	*Percent of time observed*
Direct care activities	29.7
Bedside tasks involving patient	17.7
Intravenous fluids care	1.9
Administering medications	6.9
Talking to patient	1.8
Physician's rounds	1.4
Indirect care activities	62.4
Medication preparation	9.3
Working with nursing Kardexes	6.2
Checking physicians' order book	5.0
Recording patient data	4.6
Miscellaneous paperwork, listmaking	3.1
Personal note taking	3.0
Supplies	2.5
Using medicine tickets	1.9
Talking with other staff members	11.3
Talking on telephone	3.6
Nursing report	7.0
Other	4.9
Idle	7.9



from the same nursing units confirm that at least 15 percent of physicians' orders are not carried out (*12*). Furthermore, the medication error rate (7.4 percent) is as high on these units as at other similar institutions in which this error rate has been studied (*13*). A patient classification system with indices derived from studying these nursing units would not solve these problems.

Rational Activity Categories

To remedy this situation, a group of physicians and nurses at the Johns Hopkins Hospital drew up the following list of nursing activities that should be performed for their patients and that require consideration in budgeting for nurse staffing:

1. Carrying out physician's orders
2. Carrying out nursing care plan or nursing orders
3. Initial patient assessment and preparation of care plan
4. Daily reassessment (nursing rounds)
5. Patient education
6. Administrative duties—team leader (or primary nurse) and head nurse
7. Physician's rounds
8. Giving reports to next shift
9. Serving meals, snacks, water
10. Personal breaks, meals
11. Unpredictables, for example, cardiac arrests
12. Irregular or infrequent activities, for example, nursing education conferences

The problem was how to translate this list into numbers of staff. Items 1 and 2 constitute the bulk of what nurses do each day in both direct and indirect categories of care. They generate the numerous tasks to be done for each patient. These vary considerably from day to day and from patient to patient. It is this variability which actually creates the problems of staffing. The other 10 items on the list are either relatively constant from day to day (items 6 to 10) or require arbitrary decisions regarding the amount of time to be allocated (items 3 to 5) or are so unpredictable or infrequent that there is no way or need to predict the requirements to staff for them on a day-to-day basis (items 11 and 12).

At the Johns Hopkins Hospital a computer-based system had been developed to communicate the orders of nurses and physicians within the nursing unit. This system was developed for reasons completely unrelated to the questions about nurse staffing. Because one output of the system was an hourly list of tasks to be performed for each patient, the system provided a unique tool to quantify the two categories of nursing tasks which normally would be the most difficult to measure—carrying out physicians' orders and nursing orders.

Standard times to perform the various tasks have been reported (*14*), and when the hundreds of tasks are totaled each day, the variations in task time for each patient tend to average out. Using the computer to measure these task-oriented variables of nursing care as determined by the physicians' and nurses' orders and adding the measured or arbitrarily determined time for the other activities on the list, we were able to measure the needs for nursing staff on a nursing unit. Furthermore, this measuring was accomplished without use of a patient classification system. A sample of these results is shown in table 2. The specific values in the table are not intended to be used with confidence because the period sampled was too brief. The data are shown merely to illustrate a method of nurse staffing which I call functional activity budgeting.

Benefits of Functional Activity Budgeting

This approach could have significant benefits in our present cost-conscious health care environment. First, it separates quantifiable components of nursing care from arbitrary or nonquantifiable components. It makes explicit the arbitrary decisions about nursing programs such as whether to give patient education, take a nursing history, or perform rounds, and translates these decisions into hours of nursing care and therefore dollars. It puts a dollar value on each component of nursing services. Thus, as shown in table 2, since nurses spend 40 percent of their time on the day shift carrying out physicians' orders, a dollar value can be assigned to the nursing care required for this function. A dollar value can similarly be assigned to carrying out the nursing care plan, giving patient education, or performing nursing rounds. These sums then become the basis for budget justification. If the hospital does not desire to or cannot provide the nursing budget requested, the nurse, the administrator, and the physician can decide on specific services or parts of services they wish to purchase.

Budget negotiations can be rational and concrete and tied directly to the nursing program. Choices can be discussed in dollar terms. For example, would it be

Table 2. Need for nursing staff on an adult medical nursing unit

Nursing shift	*Day 1*	*Day 2*	*Day 3*	*Day 4*
Morning				
Total hours of care needed	90	104	97	93.5
Activity (percent of time):				
Physicians' orders	39	38	40	36
Nursing care plan	27	31	29	31
Patient education	4	4	3	4
Other categories	30	27	28	29
Evening				
Total hours of care needed	64	74	68	66
Activity (percent of time):				
Physicians' orders	49	47	48	45
Nursing care plan	15	20	18	21
Patient education	6	5	5	5
Other categories	30	28	29	29
Night				
Total hours of care needed	35.5	38.5	39	37
Activity (percent of time):				
Physicians' orders	52	53	51	48
Nursing care plan	20	20	22	25
Other categories	28	27	27	27

worth a 10 percent reduction in carrying out physicians' orders to provide 100 percent more patient education? Are nursing rounds worth an 8 percent increase in the budget? Should 3 percent of the nursing budget be spent on serving meals or should that service be purchased elsewhere? Such discussions cannot be carried out when the budget request is based on a patient classification system or the more primitive patient census ratios. All the functional components of care are buried in the classification indices, and they cannot be factored out.

The second benefit of functional activity budgeting is that it enables the utilization review of physicians' use of nursing services. The physicians' contribution to nursing demand is quantified separately, and it can also be quantified for an individual physician. Cost review commissions, professional services review organizations, and utilization review organizations place great emphasis on how many laboratory tests or X-rays physicians obtain in various situations. Nursing services, the largest overhead cost in a hospital, must be reviewed in the same way. Surely some physicians, by the stroke of a pen, overutilize these costly resources.

Functional activity budgeting is not a methodology that can be practiced universally today. It can only be adopted if the major time components of nursing care—those reflected in physicians' and nurses' orders—are easily quantified, using a computer system. It would be equally impractical to enter all physicians' and nurses' orders into a computer solely to determine nurse staffing. However, as more and more hospitals begin to use an information system to communicate physicians' and nurses' orders for patient care, functional activity budgeting can become an automatic spinoff. Then funds for the nursing program can be rationally allotted in the budget, and nurses, physicians, and administrators can discuss in concrete terms what services they will or will not provide their patients.

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SYNOPSIS

SIMBORG, DONALD W. (Johns Hopkins Hospital, Baltimore) *Rational staffing of hospital nursing services by functional activity budgeting. Public Health Reports, Vol. 91, March–April 1976, pp. 118–121.*

Nursing services are a costly item in the hospital budget, yet their justification is usually based on precedent and anecdote. Patient classification systems enable quantification of the nursing load on a daily basis. This methodology for determining the size of the nursing staff, however, has not gained widespread use because it tends to formalize existing staffing patterns.

At the Johns Hopkins Hospital, physicians and nurses drew up a list of activities that should be performed for patients and that need to be considered in budgeting for nursing services. The largest and most variable components of the nursing workload are the tasks specified by physicians' orders and the nursing care plan. A computerized information system which communicates these orders can also be used to quantify these components of the nursing workload, since standard times to perform these tasks have been documented. The variability of these tasks from day to day and from patient to patient is the source of most of the problems of staffing.

Other components of the workload, such as patient education, depend on the nursing program desired and must be added separately. Budget decisions can then be based upon the specific nursing functions which the hospital desires to perform. The technique of functional activity budgeting can also be used for the utilization review of physicians' use of nursing services.