Spring 1979

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Publication Info

California Management Review, Volume 21, Issue 3, Spring 1979, pages 82-93.

<http://cmr.berkeley.edu/>

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A Methodology for Nurse Staffing

It is obvious to even the casual observer that hospital costs have increased at an alarming rate in recent years. Most significant in this increase has been the cost of hospital personnel. Personnel payroll is responsible for over 60 percent of the total resources expended for health services.¹ Furthermore, it appears that these costs are growing at an increasing rate. Abernathy and co-authors state that "payroll expenses per employee increased an average of 5.4 percent per year during the period 1961 through 1968, and 10.1 percent during 1968 alone in nonfederal, short-term hospitals." This increase in employee salaries does not appear to be spurring a decrease in other expenses as "expenses per patient day increased on an average of 8.4 percent per year during 1961 through 1968, and were up 13.5 percent in 1968."² More recent figures indicate that this trend is continuing, with a net increase of 10.3 percent per year in earnings per employee and a net increase of 16.0 percent per year in total expenses for nongovernmental, nonprofit community hospitals for the years 1969 to 1971.³

In addition to increases in employee salaries, there have also been significant increases in the number of personnel per 100 census. These increases have amounted to 2.9 percent per year

for nonprofit hospitals and 3.8 percent for private nongovernmental community hospitals for the years 1969 through 1971.⁴

One key to the reduction of personnel costs lies in the nursing area. Nursing staff salaries represent the single most costly component of hospital operations, yet many hospitals employ nurses inefficiently.⁵ In a study of nursing utilization a researcher discovered an average of 19 percent "standby" time on two hospital units.⁶ Another study examined forty-one nursing units during a twenty-four hour period and found an overall utilization rate of 78 percent.⁷ In addition to obvious inefficiency, there is evidence to suggest that additional problems arise as a result of overstaffing. One nursing study discovered that overstaffing "increased boredom and restlessness, and resulted in a much more tired feeling."⁸

It seems clear that a systematic approach to the problem of nurse staffing can result in significant decreases in hospital costs. This article describes a protocol aimed at more efficient use of nursing personnel and a method for a more accurate determination of patient load.

Present Staffing Practices

Much of the inefficiency involved in the alloca-

tion of personnel stems from the fact that hospitals make a number of common errors with regard to staffing. The first error occurs at the time forecasts are prepared. Forecasts are frequently prepared for the long term, and thus, "hospitals are unable to detect and respond to short term fluctuations. As a result, actual occupancy may run well below forecast for several months without adjustments being made."⁹ In such situations, individuals are added to the staff in anticipation of an increase in patient load. Patient load, however, does not automatically increase at the time budgets are approved; rather, it increases gradually over the budget period. This results in overstaffing. Another problem occurs when, "in some instances the level of aggregation of forecast is too great for it to be particularly useful. A forecast of the overall utilization rate is often made for the entire hospital."¹⁰ In this case, while the overall forecast may indicate that patient load is increasing, some of this increase may occur within units that can easily absorb additional loads with existing personnel. Therefore, forecasting at such a level precludes the assignment of new personnel to areas where they are truly needed.

Closely coupled with high aggregation is the fact that many hospitals forecast census rather than patient load. Abernathy and associates state, "We know of no attempt by hospitals to forecast patient load directly; there is almost single-minded attention to forecasts of census."¹¹ These census figures are usually multiplied by some constant, such as 5 hours, 4 minutes are used in one study,¹² or 3.2 hours, as used by many hospitals.¹³ The resulting number is then used as a forecast of patient load. This estimate can be very inaccurate, since investigators have shown that load is not correlated with census. This appears to be a common problem not only in the construction of forecasts but also in the assignment of personnel.

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The final error which many hospitals make is demonstrated by the fact that personnel are commonly budgeted at a level sufficient to satisfy peak demand. Demand, however, may fluctuate on both a daily and a seasonal basis. In many cases hospital units show predictable monthly variations in patient load. Abernathy and associates point to the fact that budgeted personnel, "for a given month do not necessarily relate to that month's forecast, but to the forecast for the month in which peak demand is expected to occur."¹⁴ With regard to daily fluctuations Connor shows that "the nursing care load must be expected . . . to have a large variation. The implication to the hospital administrators is that a large variation in the basic nursing task must be expected, and some action should be taken to meet this variation."¹⁵ Many hospitals have no formal provision for accommodating fluctuations in patient load either on a daily or seasonal basis. This creates uncertainty and, "faced with uncertainty as to what the specific staff requirements of a nursing unit will be on a given day, the staffing planner tends to anticipate the worst situation and staff for peak levels."¹⁶ In situations like this, "the consequences of failing to provide adequate patient care during periods of peak demand loom far larger in the supervisor's mind than the consequence of overstaffing."¹⁷

The protocol developed in this paper is aimed at eliminating the problems stated above. In the case of forecasting, it will advocate forecasting on a hospital unit basis. In this way, forecasted load can be compared with present staffing on the unit itself and an honest determination made regarding increases in staff. In addition it will look at weekly patient load figures for the previous year. This will enable hospital management to gain insight into the seasonal variation of load on each unit. When seasonal variation is noted, methods can be devised to more equitably allocate personnel during such periods.

In the case of daily variation in patient load, management should think in terms of methods the hospital can use to adjust personnel capacity. These methods include, but are not limited to, the use of part-time employees and the establishment of controlled variable staffing or float pools. With respect to part-time em-

ployees, a survey of nursing directors revealed that "part-time nurses were reliable help and dedicated to nursing; that broader programs to use part-time nurses were needed; that many hospitals could not be adequately staffed without part-time nurses, whose value outbalanced any extra administrative work they caused; and that use of part-time nurses was not unfair to full-time nurses."¹⁸ While the use of part-time employees depends to a large extent upon the individual characteristics of the hospital as well as the community, the value of such a program is difficult to ignore.

The technique of controlled variable staffing involves a reduction in the number of full-time employees on a hospital unit to an amount required for minimum loads. The day-to-day fluctuations above minimum load are then compensated using a pool of cross-trained float nurses.¹⁹ Economies in staffing are realized from such an arrangement because, as Connor observed, "it is indicated that the patient care loads are independent of one another, and therefore the average demand of four floors has a smaller variation than it has for a single floor."²⁰ Therefore, the use of a float pool can substantially reduce the amount of overstaffing and thereby reduce costs. Although the use of such a system has been shown to increase both morale and productivity, several objections have been raised about its use.²¹ Abernathy and co-authors summarize some of the problems:

Float nurses require more training and orientation. They are often uncomfortable in their jobs because they may forego the opportunity to achieve continuity in providing care to individual patients or because they are unfamiliar with the staff members with whom they work. Nursing supervisors sometimes feel that float and part-time help are inefficient. These objections, as well as certain institutional and legal constraints, have tended to limit the use of float, overtime, and part-time nurses in practice.

However, they also go on to say:

It is quite possible, however, that these problems occur because the variable staffing procedures are not implemented properly. A more careful selection of float or part-time nurses, pay scales commensurate with the increased responsibilities of such nurses, and demonstration of the benefits to all nurses in the hospital may alleviate many of the objections. For float nurses themselves, one might hypothesize that with careful attention to the issues, they would be challenged by the greater diversification in their jobs. Also, the training of student

nurses in hospitals using controlled variable staffing would occur under more stable conditions than in hospitals where the work load per nurse is more volatile. The important point, however, is that the benefits of various short-term scheduling possibilities must be considered separately from their collective disadvantages. If the benefits are sufficiently attractive, then the administrator can be assured that time consumed in search for creative ways to overcome the difficulties will be well spent.²²

Finally, in a recent survey of administrators of voluntary and municipal hospitals in New York City, a researcher discovered that the administrators believed in flexible assignment of personnel. They felt, however, that this was hindered by professionals confining their activities to professional functions.²³

While the value of flexible assignment of personnel (controlled variable staffing) has been established in many cases, it is recognized that all hospitals, for reasons mentioned above, may not wish to participate fully in such a program. For this reason a mechanism will be built into the following protocol to allow for different degrees of participation.

General Protocol

The items listed below refer to steps in the protocol shown in Figure 1. In hospitals where a float pool of personnel exists, it will be assumed that the present number of pool individuals is adequate for the daily functioning of the hospital; having been determined historically by means of trial and error. While references will be made to patient load, a discussion of how this load is determined will be postponed until the protocol has been fully explained.

Step 1. As discussed previously, many hospitals forecast personnel requirements at a high level of aggregation and with little consideration of seasonal variations. This results in a forecast which is not able to predict the number of personnel required on each hospital unit. This step as well as the next is specifically aimed at this problem. At this step, weekly load figures are collected for the particular unit for the previous fifty-two weeks. These load figures are expressed in terms of the number of personnel hours which were required to meet the patient load on that particular unit for the specific week in question. Again, a discussion of how this figure can

Figure 1. General Protocol

*Note: Adjustments to float pool are made by an amount equal to FPR (MPSL-CSC).

Table 1. Patient Load (Historical)

	Days													
	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
Daily Hours (Patient Load)	95	105	112	103	98	112	90	85	97	100	115	122	115	94

Table 2. Patient Load (Projected)

	Days													
	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
Daily Hours (Patient Load)	124	136	146	134	127	146	117	111	126	130	150	159	150	122

be arrived at must be postponed until later in this article. For now, consider an array of fifty-two figures each of which represents the amount of hours required to adequately care for the actual census of patients for the previous fifty-two weeks on the specific hospital unit. These figures are then examined in an attempt to determine if significant seasonal shifts in patient load (amount of hours required) occurred during the previous year. If no significant shifts are noted then the remaining steps in the protocol need only be completed once for the entire year. In this case, the planning period is determined to be one year. If significant shifts in patient load do, in fact, exist during the year then the remaining steps in the protocol must be repeated for each period where a significant difference from another period is observed. For example, assume that a unit required approximately 700 hours per week to care for patients for the months of January through June. During the period of July through September, however, this load dropped to approximately 600 hours. Finally, the months of October through December show a return of the required hours to 700 per week. In such a case there are three planning periods, the first consisting of six months duration and the remaining two consisting of three months each. The steps of the protocol, however, need only be carried out twice since there is no significant difference in patient load for the months of January through June and the months of October through December.

The determination of what constitutes a significant shift in load is somewhat difficult to specify. Among other things, it will depend upon the actual amount of the load involved, the duration of that load, and the administrative policies of the particular hospital. A shift of 20

hours per week in the patient load for a period of three weeks may be considered insignificant because it involves the relocation of one-half of a full-time equivalent employee (FTE) for a period of only three weeks. A redistribution of this sort may be more readily accomplished through the normal use of a float pool without having to resort to a permanent shift in personnel. On the other hand, a shift of 40 hours per week in the patient load for a period of three months probably constitutes a significant shift. This would involve the relocation of an F.T.E. for a period of three months. Such a determination is basically a policy decision to be made by hospital management. It should be kept in mind, however, that the degree to which such shifts are accommodated will determine the degree to which personnel are adequately utilized.

Step 2. This step involves projecting the unit daily patient load hours for each shift for a representative period during the planning period. While this step may appear to be quite involved, in practice the procedure is relatively simple. First, a representative period for each hospital unit of approximately two weeks is chosen within the planning period. Since it must represent the entire period it should be chosen carefully so that the peaks and valleys of the planning period are adequately represented. Once this is chosen the unit's patient load in hours is computed from historical figures for each day during that period. Having determined these daily load figures for the particular unit, they must then be adjusted by the projected change in census (if any) for the next year's planning period. For example, assume that the figures shown in Table 1 represent daily patient load figures for a hospital unit for a representative two weeks during the January through June 1979 planning period.

Table 3. Distribution of All Nursing Personnel

<i>Day Shift</i>	<i>Evening Shift</i>	<i>Night Shift</i>
45%	36.6%	18.4%

Let us further assume that the hospital anticipates a 30 percent increase in census on that unit for the same January through June planning period in 1980. In that case the projected figures would be as shown in Table 2. These figures are simply those in Table 1 increased by 30 percent.

The figures for each day shown in Table 2 represent the patient load for a twenty-four-hour period composed of three shifts. Since it is necessary to examine the staffing pattern on each shift, these figures must be broken down into the number of hours required on each shift. Determining the amount of daily hours which are attributed to each shift may be done in two ways. The hospital itself may have data which indicate the percentage of total hours expended on each shift. If these percentages are available they may be used provided they were not obtained by examining previous staffing patterns. This would amount to a case of perpetuating percentages which may be inaccurate to begin with. To be accurate the percentages should be obtained through the use of direct work measurement. If these data are not available a first approximation may be made using the percentages developed by the Commission for Administrative Services in Hospitals. They exclude Nursery, Labor, and Delivery, and Intensive Care Units. These percentages, shown in Table 3, represent the recommended distribution of nursing personnel including charge nurses, nurses aides, orderlies and ward clerks.²⁴ Using the previous adjusted daily figures in Table 2 it is now possible to compute the number of hours required on each shift. In the case of the Nursery, Labor, and Delivery, and Intensive Care Units, an attempt should be made to obtain shift distribution percentages from direct observation. These units are unique in that there is an almost even distribution of personnel across shifts. The projected patient load for the day shift appears in Table 4.

Step 3. This point in the protocol calls for a policy decision about the use of a float pool of employees to adjust for fluctuations in load. In order to illustrate this point it is best to graph

the data in Table 4, although this step need not be taken in the actual protocol.

The extent to which a hospital wishes to utilize a float pool is directly related to the determination of the minimum permanent staff level (MPSL) of a unit during a shift. If the number of staff assigned to the unit were ten, this would provide an MPSL capacity of 80 hours during the day shift. In such a case, even if one employee on the unit was absent, thus providing a capacity of 72 hours, the worst anticipated case would have been met and a float pool would be unnecessary. In this case, however, assuming no absence occurs, the amount of overstaffing (unnecessary personnel each day) would total 27 man-days within the two-week period. If the MPSL was reduced to nine persons this would decrease the amount of overstaffing to 13 man-days. This case would either require the use of a float pool to take the place of individuals that are absent or would leave the unit understaffed when a high load and an absence occurred at the same time. In effect, the administrator is trading convenience and continuity of care factors for a substantial increase in staffing efficiency. Finally, if the MPSL level is set at seven persons the amount of overstaffing would decrease to a maximum of 3 man-days. This would have to result in an increase in the float pool capacity over the level needed for an MPSL level of nine persons; however the float pool increase would be much less than the difference in personnel (two people) required at each level. This occurs because, as described earlier, the average patient load across many units has a smaller variation than it has for a single unit.

A final point which should be made is that for illustration purposes the MPSLs in the previous example were set at increments of 8 hours. This need not be the case. It is possible for the MPSL to be set at any level. This could be arranged through the use of part-time employees, overlapping shifts, permanent assignment of an individual to more than one unit, or permanent assignment of a float pool person for a portion of a shift. For this reason, a policy could be established on how the MPSL level is to be set. For example, one might decide to set the MPSL level at 90 percent of the mean of projected patient load hours per shift. In the case of Table 4 the

Table 4. Patient Load (Projected), Day Shift

							Days							
	Su	M	Tu	W	Th	F	Sa	Su	M	Tu	W	Th	F	Sa
Daily Hours (Patient Load)	55	61	66	60	57	66	53	50	57	59	68	72	68	55

mean is equal to 61; therefore the MPSL level would be set at (61×0.90) or 55. It is also possible to set the MPSL level in relation to the mean and variance of the projected patient load hours per shift. Regardless of how the level is established, the remaining steps of the protocol are then followed for each shift.

Step 4. At this point the already established MPSL for each shift is compared to the current staff capacity (CSC) or the present capacity of the personnel assigned to that particular shift. This comparison attempts to determine if the current staff capacity is above or below the staffing policy for the shift as expressed in the MPSL. If CSC exceeds MPSL then the protocol proceeds to Step 5. If MPSL is greater than CSC then it proceeds to Step 6. If both are equal then no further steps need be taken since it was assumed at the beginning of the protocol that the float pool was adequate for the daily functioning of the hospital.

Step 5. Here the degree to which CSC exceeds MPSL is examined. If CSC exceeds MPSL by an amount approximately equal to or greater than a readily assignable person, then strong consideration should be given to a reduction or transfer of personnel for the planning period. A readily assignable person normally means a full time employee assigned to the particular shift on a regular basis. It can also mean any individual who is normally assigned to the particular shift for less than 8 hours. Such situations would occur with part-time employees, those with multiple shift or unit assignments or individuals who are permanently assigned for only a portion of a shift. In effect, this means that cases may arise which warrant a reduction or transfer of personnel where CSC does not exceed MPSL by an amount equal to at least 8 hours.

Where CSC exceeds MPSL by less than 8 hours and there are no readily assignable persons with work hours approximately equal to the amount of the reduction desired then a decision must be made. Either the staff must be reduced by one

full-time person with a corresponding increase in the float pool or the float pool must be appropriately reduced and the staff allowed to remain at its present level. As with previous decisions, this relates to the staffing philosophy of the particular hospital.

Step 6. This step determines the extent to which MPSL exceeds CSC. If the excess is greater than or equal to 8 hours, a full-time person should be added to the unit for the planning period. If the excess is less than 8 hours, however, the protocol proceeds to Step 7.

Step 7. This last step in the protocol considers the possible permanent assignment of less than full time personnel for the planning period. As mentioned earlier, this is possible in the case of part-time employees, overlapping shift assignments, or the permanent assignment of an individual to a unit for only a portion of the day. If this cannot be readily done, an addition should be made to the float pool.

Float Pool

Implementation of the protocol described above will yield the number of permanent employees to be assigned to each shift of a particular hospital unit as well as information on the adjustments to be made to the float pool. However, as noted earlier, additions or decreases to the float pool should not be made at an amount equal to the difference between MPSL and CSC. The float pool, because of variation in unit load fluctuations, makes more efficient use of personnel. Therefore, these adjustments should be made at a rate far less than the difference between MPSL and CSC. This rate can be readily estimated with available data. It is assumed that the hospital has some historical data on the appropriate size of the float pool. The hospital also has historical data on patient load for the representative periods as calculated in Step 2 of the protocol. Using both of these data it is possible to calculate the float pool ratio (FPR). This figure can then be used as a guide for determining both the

size and the rate at which adjustments are made to the float pool.

Since historical load figures for a representative period were calculated in Step 2 of the protocol and since the current staff capacity (CSC) is also known, it is possible to determine, for all units, the number of hours during the representative period that load exceeded CSC. Historically, this is a measure of the work load which was absorbed by the float pool. This need only be done for one particular shift (such as day shift) for the entire period. From these data it is possible to calculate the FPR using the following formula:

$$\text{Float pool ratio (FPR)} = \frac{\text{Number of hours in float pool during the representative period}}{\text{Number of hours load exceeded CSC for all units during the representative period}}$$

The number of hours in the float pool for the representative period is determined by obtaining a cumulative total of the number of people in the float pool for each day of the representative period and multiplying that number by 8 hours. Again, this number need only be calculated for the same daily shift during the entire period; however, it is essential that the shift used be the same as the shift used to calculate the denominator of the FPR equation.

The FPR calculated above should be a fraction and will represent that portion of understaffed hours (total amount of hours that load falls above permanent staff) which must be contained in the float pool. For example, assume that $\text{FPR} = 1/3$. If the hospital anticipates that all units on a particular shift (such as day shift) will be understaffed by an average of 3000 hours during any given week then it must provide 1000 hours in its day shift float pool each week. In addition, when adjustments to the float pool are indicated in the protocol, the amount of the adjustment should be as follows:

$$\text{Adjustment} = \text{FPR (MPSL} - \text{CSC)}$$

The methods described above for establishing the size of the float pool are intended only as general guides. It is anticipated that as the hospital gains experience with making adjustments to the float pool it will arrive at a more accurate FPR.

Determination of Patient Load

As described earlier, many hospitals attempt to

determine patient load directly from census through the use of a single constant. The imprecision of such a system was recognized by Connor who noted that such methods of staffing resulted in wide variations in the degree of patient care. For this reason, another system was developed which attempted to classify patients into categories so that a smaller variation in each group would result. The product was a classification system which divided patients into three groups: Class I, Class II, and Class III. These classes have come to be known as minimal care, intermediate care, and complete care, respectively. The first step in obtaining an accurate estimate of patient load is to divide the census on each hospital unit into these three categories. This can be accomplished using the following rules.

Class I. Any of the following combinations:

- a. Ambulatory, or up in chair—self; Feeding self, or requires food cut; Bathing in bathroom, or at bedside—partial self.
- b. Ambulatory—with assistance; Up in chair—self; Bathing in bathroom, or at bedside—partial self.
- c. As in a and b, with Vision inadequate; oxygen therapy; Intravenous feeding; *but* no two of these factors simultaneously.

Class II. Any of the following combinations:

- a. Ambulatory—with assistance; Bathing in bathroom, or at bedside—partial self feeding—complete assistance (except I.V. feeding); Vision inadequate (optional); Oxygen therapy (optional).
- b. Up in chair—self; Bathing at bedside—complete assistance; Feeding self, or requires food cut or I.V. feeding; Oxygen therapy (optional); Vision inadequate (optional).
- c. As in b, with the following changes: Up in chair—with assistance; Bath at bedside.
- d. Up in chair—with assistance; Bath at bedside—partial self; Feeding—complete assistance; Vision inadequate (optional); Oxygen therapy (optional).
- e. Getting special care of necessity.

Note: Any patient who otherwise falls into categories I or II, but who is in isolation or is incontinent or markedly emotionally disturbed will be dropped to the next category.

Class III. All combinations not previously mentioned.²⁵

When personnel are familiar with this scheme, the classification of patients can be accomplished relatively quickly. Connor's experience indicates that patients on a twenty-nine-bed unit

Table 5. Minutes of Direct Patient Care Per Shift

	<i>Class I</i>	<i>Class II</i>	<i>Class III</i>
Mean (Connor)	28.3	58.3	139.6
Mean (Moon)	38	53	96

Table 6. Extension Factors for Specialty Units

<i>Hospital Unit</i>	<i>Extension Factor</i>
Pediatrics	1.33
ICU/CCU	3.00
Postpartum	.88
Psychiatric	1.50
Main Nursery	.88
Intensive Care Nursery	1.50
Delivery Room	2.00

can be categorized in about two minutes each. As individuals gain an intuitive feel for each category it is likely that this can be accomplished even faster without reference to the items in the previous list.

It is clear that Class I, II, and III patients should each require different amounts of care. This fact has been statistically verified by many researchers, among them Connor and Moon. Both researchers measured the amount of direct patient care in minutes for each category of patient. Their conclusions appear in Table 5.^{26,27} While there is some variation between the sets of figures, it appears that each category does discriminate well along the dimension of direct patient care.

Although the data in Table 5 illustrate the differences in direct care for each class of patient, in actual practice hospital unit personnel have other responsibilities. To obtain an accurate measure of patient load, standards must be determined which reflect these additional activities. Obviously, the ideal situation would be for each hospital to determine its own load standards for each class of patient by direct observation. If this is not feasible, it is possible to estimate patient load using the figures presented below. This estimate can then be revised through actual experience. Successive refinements of these standards should yield accurate values for patient load.

The standards shown in Figure 2 represent an extensive study of a variety of hospitals.²⁸ The figures were determined using engineering standards for direct care items while making allowances for indirect care based upon actual time

Figure 2. Average Nursing Hours/Patient/Patient Day by Type High, Low, and Mean Values

taken. Since the standards shown represent a range of values, it is necessary for hospital personnel to estimate the level of patient care offered by their particular institution. If, for example, the level of care is determined to be average, the formula for calculating patient load would be:

$$\text{Load} = (\# \text{ of Class I patients}) (2.66 \text{ hours}) + (\# \text{ of Class II patients}) (3.47 \text{ hours}) + (\# \text{ of Class III patients}) (4.97 \text{ hours}).$$

In the case of historical data, it may be impossible or difficult to discover the census of Class I, II, and III patients on each unit at a specific time. In this situation it is possible to have nursing personnel estimate the percent of Class I, II, and III patients that are normally present on the unit. In this situation the formula for load becomes:

$$\text{Load} = [(\% \text{ of Class I patients}) (2.66 \text{ hours}) + (\% \text{ of Class II patients}) (3.47 \text{ hours}) + (\% \text{ of Class III patients}) (4.97 \text{ hours})] \times \text{Census}.$$

This second equation is less accurate than the first but represents a considerable improvement over previous techniques.

The measurement technique for load shown above is suitable for both Medical and Surgical units. These units experience patients of different classifications. Other hospital units (such as Intensive Care) tend to be composed of a more homogeneous group of patients that require

Table 7. Daily Staffing Personnel Guide

Medical/Surgical, Gyn, Pediatric, Post Partum, Orthopedic (Excludes Nursery, Labor and Delivery, and Intensive Care)

Total Daily Staffing	Days			Evenings			Nights		
	RN	LVN	Aux	RN	LVN	Aux	RN	LVN	Aid
5	1		1	1		1	1		
6	1	1	1	1		1	1		
7	1	1	11	1	1	1	1		1
8	1	1	1	1	1	1	1		1
9	1	1	2	1	1	1	1		1
10	1	1	2	1	1	2	1		1
11	1	1	3	1	1	2	1		1
12	2	1	3	1	1	2	1		1
13	2	1	3	2	1	2	1		1
14	2	1	3	2	1	2	1		2
15	2	1	4	2	1	2	1		2
16	2	1	5	2	1	3	1		2
17	3	1	4	2	1	3	1		2
18	3	1	4	2	1	4	1		2
19	3	2	4	2	1	4	1		2
20	3	2	4	2	1	4	1	1	2
21	3	2	4	2	2	4	1	1	2
22	3	2	5	2	2	4	1	2	1
23	3	2	5	3	2	5	1	2	1
24	3	2	6	3	2	4	1	2	1
25	3	2	6	3	2	4	1	2	2
26	4	2	6	3	2	4	2	1	2
27	4	2	6	3	2	5	2	1	2
28	4	2	7	3	2	5	2	1	2

Distribution of total is made by logic for low census levels and on the basis of a recommended mix of approximately 30% RNs and 20% LVNs where census level allows.

Note: RN requirements are inclusive of Head or Charge Nurse positions. Auxiliary requirements are inclusive of Nurses Aides, Orderlies, and Ward Clerks.

similar levels of care. Determining the load on these units requires a different set of standards. These standards, shown in Table 6, represent relative care loads for specialized hospital units.²⁹

Since the types of patients on these units are very similar, the standard for the average patient, shown in Figure 2, is used. In the case of an average level of care, the formula for patient load on these units becomes:

$$\text{Load} = (3.62 \text{ hours}) (\text{Extension Factor}) (\text{Census}).$$

Mix of Personnel

Use of the protocol will indicate the number of

personnel to be assigned to each hospital unit for each shift. The makeup of personnel on each shift (number of R.N.s, L.P.N.s, and auxiliary personnel) is another question which should be considered. This is an important consideration because an imbalance in the mix of personnel will cause an inequitable distribution of work as well as affect the quality of patient care.³⁰ If there is a shortage of R.N.s, patient care will suffer. If there is an excess of R.N.s, there will be a reluctance to complete tasks which do not relate to either supervision or the important aspects of patient care. One researcher discovered that "when the floors were staffed with a

large number of persons, three-fourths of whom were staff nurses, the 'aide-type' of work still remained pretty much with the aides."³¹ This finding is supported by another study which discovered that a staff composed of two R.N.s and one L.P.N. accomplished more than a staff composed of three R.N.s.³²

A general guide for the distribution or mix of personnel on each shift is provided by the Commission for Administrative Services in Hospitals. This guide is shown in Table 7.³³ According to the guide if the protocol indicates that the number of permanent staff assigned to the day shift should be nine, then the distribution should be three R.N.s, two L.P.N.s and four auxiliary personnel. While the policy of the particular hospital will have an important impact on the distribution of personnel on each shift, the figures in Table 7 can provide a valuable guide for the hospital administrator.

The figures in Table 7 are not intended for use in Nursery, Labor, and Delivery and Intensive Care Units. As mentioned earlier, these are unique units and the distribution of personnel should be based upon the historical information of the particular hospital. Also, as the table indicates, the figures for auxiliary personnel include nurses aides, orderlies and ward clerks. In the case of these personnel the hospital will, again, have to decide their distribution based upon the historical or desired mix.

The protocol and procedures described above are intended as guides to hospital planners and administrators. It is felt that a systematic approach to the problem of nurse staffing will lead to increased efficiency and better patient care. While the standards presented call for successive refinement through actual experience, they, along with the procedures outlined, represent a substantial improvement over methods in current use by many hospitals.

Acknowledgment: This article was prepared under a grant from Prospective Payment Pilot Project, Social Security Administration, SSA-PMB-74-175.

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