
PRACTICAL 3 CALCULATION OF STAFF NORMS AND PREPARATION OF DUTY ROSTER

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3.0 OBJECTIVES

After going through this practical, you should be able to:

- calculate the staffing pattern for any given hospital with different methods;
- identify the factors affecting the making of duty roster; and
- prepare the duty roster of any nursing unit.

3.1 INTRODUCTION

This practical will help you to develop skill in making an estimation of the nursing staff of any Hospital with various specialized beds.

The main emphasis is on the various method to be used for calculation of nursing staff required i.e. estimating staff for a particular hospital as per nursing care time study and estimation as per Indian Nursing Council's recommendation.

The later part of the practical deals with the making of the duty roster. Guidelines have been provided to you to prepare the duty roster.

3.2 ESTIMATION OF STAFFING

Staffing is a systematic approach to the problem of selecting, training, motivating and retaining professional and non-professional personnel in any organization. It involves manpower planning to have the right person in the right place.

It focuses on long range unit needs. It gives average numerical assessment of nursing personnel needed to the service limit on round the clock. It is calculated on the basis of previous documented experiences of patients census and nursing hours required for each patient,

Staffing consists of several actions as listed below:

- determining the type and amount of service required for the particular agency.
- identifying the personnel categories with the required knowledge and skill to perform needed service.

- Estimating the number of personnel required for each job category.
- Recruiting personnel to fill positions.
- Orienting and assigning responsibility to the personnel.

3.3 WHO IS RESPONSIBLE FOR ESTIMATING NURSING STAFF

Responsibility lies with the heads of the nursing service department for estimating staffing pattern for the hospital. She should be well versed with the different methods/criterias which can be used for estimation of staffing pattern. Estimation should be made on the basis of nurse patient norms (if any) adopted by the organization or State Government. Indian Nursing Councils norms can be followed. If in any case Indian Nursing Councils norms does not suit and there are no adopted norms, then estimation of staff can be made on the basis of predicted average work-load conditions as shown on following pages.

3.4 GUIDELINES FOR ESTIMATING NURSES REQUIRED FOR HOSPITAL AS PER PREDICTED AVERAGE WORKLOAD

Various methods are adopted to classify patients and to assess nursing hours needed per day be each category of patients. As per the nursing care time study conducted by RAK College of Nursing, Delhi and TNAI, patients are classified under three categories and nursing hours needed per category of patient per shift in 24 hours were assessed as given below:

Three categories of patients are:

- 1) Completely dependent
- 2) Partially dependent
- 3) Ambulatory

Nursing hours needed per category of patient per shift are given below:

Category of patient	Nursing Hours			Total
	Morning shift	Evening shift	Night shift	
Completely dependent	3.27 hours	2.50 hours	1.47 hours	7.22 hours
Partially dependent	1.62 hours	0.91 hours	0.55 hours	3.08 hours
Ambulatory	1.20 hours	0.70 hours	0.17 hours	2.07 hours
Total:	6.09 hours	4.11 hours	2.19 hours	12.37 hours

Another study conducted at Delhi (Thomas + Lataria) has revealed that in teaching hospital there are 21.2 patients are totally dependent, 43.7 patients are partially dependent and 35.1 are ambulatory patients.

Now we shall learn how to estimate total number of nurses required for a 100 bedded hospital, having 21 totally dependent, 44 partial dependent and 35 are ambulatory patients. There are three equal shifts of duty for nurses. The following table is self explanatory to understand the method of calculation.

Category of patient	Work load Calculation for 24 hours			
	Daily average time per patient in 24 hours	Total patients in each category	Calculation per category	Total
Completely dependent	7.22 hours	21	7.22 × 21	151.62
Partially dependent	3.08 hours	44	3.09 × 44	135.26
Ambulatory	2.06 hours	35	2.06 × 35	72.10

Total work load for 100 patients = 359.68 (360 hours)
 = 8 hours in 24 hours
 Each nurse is expected to work = 360/8 = 45
 Total number of nurses required

Provision of day off, casual leaves, earned leaves and sick leaves is about 156 days per year. To meet leave vacancies extra nurses are required i.e. 30 should be taken as leave reserve. It works to 14 nurses:

$$156/365 \times 36018 = 5616012920 = 19.17 \text{ nurses}$$

Total nurses required = 45 + 14 = 59 nurses for each 14 nurses for 100 beds.

Estimating Staff as per Indian Nursing Councils Recommendations

Below given is an estimation for 150 bedded hospital. Where there are 3 beds for ICU and 3 beds for CCU, 4 cots in Neo-Natal intensive care units and two operation tables in O.T. On an average 150 patients in medical O.P.D., 70 patients in surgery, 45 in gynae, 125 in ortho and 30 in pediatrics O.P.D. attend hospital.

Recommendations of Indian Nursing Council for 150 beds are as given below:

Nursing Superintendent – 1(one is required for 150 beds hospital)

Deputy Nursing Superintendent – 1(one is required for 150 beds hospital)

Assistant Nursing Superintendent – 2(two for 150 beds and one additional for every 50 beds)

Nursing staff for wards and special units and O.P.D's

	Inc Recommendation	Nurses Required	
Total beds : 150	1 : 1 (24 hrs.)	10	
Special beds : ICU 3			
CCU 3			
NICU 4			
Total : 10			
Ordinary beds : 140	1 : 3 for teaching Hospital	46	
O.T. Tables : 2	3 : 1 tables for 24 Hrs.	6	
O.P.D's	Patients Attendance		
Medical	150	1 : 140	1
Surgical	70	1 : 120	Nil
Gynae	45	1 : 35	1
Orthopedic	125	1 : 120	1
Paediatric	30	1 : 85	Nil
Total:			65

Leave reserve 30 and 30 of 65 is 19, so total nurses required are 65 + 19 = 84

Requirement for Nursing Sisters

INC recommendation is 1 : 25 patients in each shift 80 for 150 beds requirement is = 18 (3 for 24 hours for 25 patients and 150 patients it is 18)

Leave reserve 30, 80 for 18 sisters, it will come to 8,

A is total requirement for nurses sisters is 18 + 8 = 26

For 150 bedded above mentioned hospital we need following staff

Nursing Supdt.	1
Deputy Nsg. Supdt.	2
Asstt. Nsg. Supdt.	2
Nursing Sisters	26
Staff Nurses	84

3.5 DUTY ROSTER

Definition

Duty roster is a systematic representation of the available nurses distribution round the clock for various shifts in the hospital in order to render quality patient care.

3.6 FACTORS AFFECTING DUTY ROSTER OF A WARD

Following factors affect the marking of duty roster of a ward:

- Work load index — Work load index quantifies the care needed to be given and the number of nurses required for the case.
- Patient classification — it identifies degree of nursing care needed by the patients in particular unit.
- Patients needs — it is important to determine level of case and requirement of performance to that level.
- Scheduling — it is the distribution of nurses on all through shifts of the day.
- Staffing — it tells average number of nurses needed for the service in a unit round the clock.
- Daily adjustment — it provided for an increased or decreased provision of nursing personnel, if work load is below of above the average, need is anticipated.

3.7 CRITERIA FOR MAKING DUTY ROSTER OF A WARD

Before making duty roster one should have following information at hand:

- Total number of patients in ward.
- Number of patients as per categorization (How many completely dependent. How many partially dependent. How many are ambulatory).
- Number of hours each category of patient require in each shift. (This can be calculated on the basis of studies conducted at Delhi and referred earlier in this chapter.
- Work load calculation for 24 hours for total points of each category.
- Number of total nurses required for nursing case as well as for allowing days off, casual leave, earned leave etc.
- Number of nurses required in each shift as per the categories of patients or work load index.
- How many nurses can be given days off or leave daily.
- To make an even distribution of night and evening shifts you need to calculate how many night shifts and evening shifts minimum each nurse will have to take in a month.

3.8 SAMPLE DUTY ROSTER

Placed below is the information required for making a duty roster:

- Name of the ward : Male medical ward
- Total patients 30
- Categorization of patients and number of hours each category will require in each shift (as per the study conducted at Delhi).

	No. of pts. in each category	Morning shift	Evening shift	Night shift	Total
Completely dependent	5	3.27	2.50	1.47	7.24
Partially dependent	15	1.62	0.91	0.55	3.08
Ambulatory	10	1.20	0.70	0.17	2.07
Total:		6.09	4.11	2.19	12.39

- Work load calculation for 24 hours for total number of patients in each categories:

Category of patient	Daily average time per patient in 24 hours	Total patients in each category	Calculation per category	Total
Completely dependent	7.22	5	7.22 × 5	36.10
Partially dependent	3.09	15	3.09 × 15	46.35
Ambulatory	2.06	10	2.06 × 10	20.60
Total:				103.5 hours

Total work load for 30 patients = 103.5 hours

- Total number of nurses required

each nurse is required to work = 8 hours/day

total number of nurses required = $103 \div 8 = 13 = 13$ nurses approximately

Total casual leaves, day off, earned leave and sick leaves comes to 156 per year

To meet leave vacancies extra nurses required are = $156 \div 13 = 12 = 6$ approximately.

So in total $13 + 6 = 19$ nurses will be required for a 30 patients.

- Distribution of these 19 nurses will be as follows:

Work load Calculation for 24 hours

No. of patients	Category of patient	Morning shift	Evening shift	Night shift
5	Completely dependent	$3.27 \times 5 = 16.35$	$2.5 \times 5 = 12.50$	$1.45 \times 5 = 7.25$
15	Partially dependent	$1.62 \times 15 = 24.30$	$0.91 \times 15 = 13.65$	$0.56 \times 15 = 8.40$
10	Ambulatory	$1.2 \times 10 = 12.00$	$0.7 \times 10 = 7$	$0.17 \times 10 = 1.70$
	Nursing time in each shift	52.65	33.15	17.35
Total: 103.15 hours				

Staff requirement in each shift according to work load in each shift:

Morning shift = $52.36 \div 13 = 4 = 7$

Evening shift = $33.15 \div 13 = 2 = 4$

Night shift = $13 - (7 + 4) = 2$

So, we have 7 in morning shift, 4 in evening shift and 2 in night shift. For 30 patients in male medical ward.

- We need to give 8 days off to each nurse and to 19 nurses it will come to $19 \times 8 = 152$ days off to be given in 30 days. On 28 days 5 nurses will get day off ($6 \times 2 = 12$) so $140 + 12 = 152$ will be completed in 30 days.
- We need 7 nurses in morning shift but we have eight nurses on 27 days means one nurse can be spared on 27 days to adjust leave.
- There is a need of 4 nurses on evening duty daily in the ward means in total $30 \times 4 = 120$

evening shifts in 30 days. For even distribution of evening duty 13 nurses will get six evening duties per head ($13 \times 6 = 78$) and 6 nurses will get 7 evening shifts in 30 days ($6 \times 7 = 42$) and $78 + 42 = 120$. Evening duties will be covered.

- For night duty, there is a need of two nurses daily in ward for 30 days and in total $30 \times 2 = 60$ nights are duties to be performed. We have 19 nurses, 16 nurses will perform 3 nights in a month ($16 \times 3 = 48$) and three nurses will perform 4 nights in a month ($3 \times 4 = 12$) in total $48 + 12 = 60$ nights will be covered.

3.9 LET US SUM UP

In the beginning of the practical, we have learnt how to make an estimation for the staff for a particular hospital. We have gone through the meaning and philosophy of **staffing** and what are the important factors which affect staff estimation. Then we have enlightened you in detail.

The different methods to be used for staff estimation. First we have discussed the classification of patients and measurement of nursing service hours for each category of patients. We have also learnt how to calculate the number of nurses required according to nursing service hours in total and also in each shift along with the requirement of nurses in leave reserve. We have also done exercise for estimation of staff as per **INC** norms. In the latter part making of duty roster has been dealt at length to avoid over **staffing** or understaffing in a ward and to facilitate a desirable **distribution** of days off, evening and night duty among the nursing personnels.

3.10 ASSIGNMENT

- After selecting a ward of hospital, study the types of patients and nursing time requirement for each category of patients.
- Estimate the staff for the **same** ward and also distribution of nurses in each shift along with leave reserve requirement of staff nurses.
- Estimate staff requirement for 100 bedded hospital as per **INC** norms.
- Make a duty roster for one ward of your hospital.

Exercise

Practical-I: Calculate the nursing manpower for the Government Hospital of 250 beds, where there are following specialized beds:

ICU beds	=	4
CCU beds	=	4
Nephrology beds	=	4
Operation Theatre	=	2 tables
Casualty and Emergency	=	5 beds
ENT beds	=	3
Medical	=	85
Surgical	=	75
Paediatric	=	20
Gynae and obstetric	=	50

Practical-11: Make the duty roster of any two unit of your hospital, where you have been rotated.