

MANPOWER ANALYSIS OF TECHNICIANS WORKING IN CATH LAB AND DIALYSIS DEPARTMENT

**Internship Training
at
Wockhardt Hospital, Nashik, Maharashtra**

**By
Arushi Kamthan**

**Under the guidance of
Col. (Dr.) Ashok Kaushik**

**MBA Hospital & Health Management
2013–15**


**Institute of Health Management Research
Jaipur
2015**

Internship Training

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TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr. Arushi Kamthan** student of MBA Hospital and Health Management from IIHMR University, Jaipur has undergone internship training at **Wockhardt Hospital, Nashik** from **28th January 2015 to 28th April 2015**.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.



Col. Dr. Ashok Kaushik
Dean, Academics and Student Affairs
IIHMR, Jaipur



Col. Dr. Ashok Kaushik
Professor
IIHMR, Jaipur

11th May 2015

TO WHOMSOEVER IT MAY CONCERN

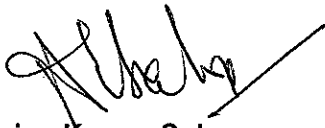
This is to certify that **Dr. Arushi Kamthan** has undergone internship at Wockhardt Hospital, Nashik unit from **28th January 2015 to 28th April 2015**. She has worked under **Dr. Purvi Taneja** and has completed the projects as under :

1. Manpower Analysis of the technicians working in Cathlab and Dialysis Department

During the tenure we found her to be sincere, dedicated and very hard working.

We wish her success in her future endeavors.

For Wockhardt Hospitals Limited

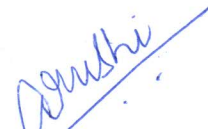


Amiya Kumar Sahoo

Joint General Manager - Human Resources

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Manpower Analysis of the Technicians working in Cath Lab and Dialysis Department** and submitted by **Dr. Arushi Kamthan** Enrollment No **2013-15/1425** under the supervision of **Col. Dr. Ashok Kaushik** for award of MBA Hospital and Health Management of the university carried out during the period from **2013 to 2015** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.


Signature

1. ABSTRACT

The study was conducted to find whether right number and right kind of people have been put at the right place and doing the right things for which they are suited for the proper functioning of the Cath Lab and Dialysis departments. The current manpower status needs to be analysed and thus measuring workforce productivity is one of its way. Although, it is difficult to measure productivity in service industry as compared to manufacturing firms. It is a quantitative cross sectional analytical study whose objectives included calculating approximate productivity of the technicians and also finding methods for their better utilisation. Time Motion Study was done where each activity of the technicians was noted and duration was timed. The observation was continued for certain days and the productivity was measured. The idle time was also compared to the productive hours on per day basis. After completing the observations, it was calculated that the productivity of the Cath Lab Technicians was approximately 31.31% while that of the technicians of the Dialysis Department was approximately 88.46%. On an average, the idle time of Cath Lab technicians was 5.26 hours out of 8.5 hours of their working time and for Dialysis technicians it was 52.1 minutes with extended working hours as well.

In case of Cath Lab, the job of Customer Care was also observed whose productivity was around 42.53%. It was observed that additional responsibilities can be given to the technicians such that the Customer Care can be better utilised in areas with more of work flow and patient load.

In Dialysis department, change in duty roster of technicians were done with recommendation of additional machine resource such that the department can be better utilised with reduction in overtime paid to the manpower.

Thus, Manpower Analysis of the Technicians working in Cath Lab and Dialysis Department showed that the productivity and utilisation can be effectively done through change in duty rosters, giving additional responsibilities, clearing ambiguity in work and training for multitasking.

ACKNOWLEDGEMENT

I extend my sincere gratitude to **Dr. Purvi Taneja**, who has been my mentor for the summer internship program & has been instrumental in helping me shape this study in a desirable way and for giving me the opportunity to do this study and undergo the process of learning. I thank her for all the trust and faith she posed in me and I only hope that I have been able to live up to her expectations. Her guidance and support was helpful in enhancing my work.

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I would like to express my sincere thanks to **Dr. S.D. Gupta (President), Col. Dr. Ashok Kaushik (Guide & Dean), Dr.V.P Raghuvanshi (Mentor)** and **all the faculty members of IIHMR** for their consistent guidance, valuable time and extended cooperation. I am also grateful to my parents, my family and my friends for giving me moral support.

However, I accept the sole responsibility for any possible error of omission and would be extremely grateful to the readers of this project report if they bring such mistakes to my notice.

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ABBREVIATIONS

ACLS	Advanced Cardiac Life Support
BLS	Basic Life Support
BME	Bio Medical Engineering
BMW	Bio Medical Waste
CDTT	Catheter Directed Thrombolytic Therapy
CMO	Chief Medical Officer
CRAM	Clinical Review & Academic Meet
CSSD	Centralised Sterile Storage Department
CT	Computerized Tomography
CVT	Cardio Vascular Thoracic
ENT	Ear, Nose & Throat
EP	Electro Physiology
ERCP	Endoscopic Retrograde Cholangio-Pancreatography
FFR	Fraction Flow Rate
HD	Haemodialysis
IABP	Intra Atrial Balloon Pump
ICU	Intensive Care Unit
IPD	In Patient Department
IT	Information Technology
MLC	Medico Legal Case
MRD	Medical Records Department
MRI	Magnetic Resonance Imaging
NABH	National Accreditation Board for Hospital & Healthcare Providers
OPD	Out Patient Department
OR	Operation Room
PTC	Pharmacy & Therapeutic Committee
SICU	Surgical Intensive Care Unit
SLED	Sustained Low Efficiency Dialysis
SNRT	Sinus Node Re-entrant Tachycardia
UHID	Unique Hospital Identification

DISSERTATION

1. MANPOWER ANALYSIS OF THE TECHNICIANS WORKING IN CATH LAB AND DIALYSIS DEPARTMENT

1.1 INTRODUCTION

There is no denying the fact that the continual positive development of a business is owing to its effective resource planning. Making preparations and arrangements on the basis of what is expected to happen and performing tasks in an organized and capable way is one of the important roles of management in that it involves effective planning process. It is through the process of planning as well as designing the organizational structure by assigning an assortment of responsibilities to the employees that business organizations may accomplish their set objectives. [1]

The analysis of employee jobs, and the evaluation and development of accurate job descriptions are integral to the support and success of any company's human capital management. Such analysis, evaluation and developments aids in:

- Recruiting the right candidates;
- Establishing competitive compensation and benefits packages;
- Strengthening individual employee productivity and engagement;
- Identifying training needs;

Successfully completing job analysis evaluation or developing job descriptions effectively is critical to human capital development and, more often than not, requires specific expertise and knowledge.

1.2 LITERATURE REVIEW

- Every organisation operates for the purpose of achieving some goals and objective. To facilitate that, firms employ and utilize resources such as man, money, machine, and material. Manpower planning is the commencement stage in manpower management, which is made up of planning for future needs for the workers, planning for the availability of such workers, before taking steps to compare supply and demand. The major factor that encourages effective manpower planning is job analysis, which does two things. Firstly, the personnel manager gets to know about the job itself, the information of which is called job description. Secondly, it describes the skills, abilities, and other characteristics needed to do the job and this is job specification. Obviously, this implies that job analysis is the source of information needed for effective manpower planning. [2]
- In projections of manpower requirements, it is common to give specific values for future expected demand for labour by occupational or educational classes. Any variance from the conditions assumed in determining such manpower requirements will modify those specific estimates. In this paper we consider the application of sensitivity analysis to this problem. Areas of potential imbalances have to be identified some time before they materialize if plans for reducing manpower shortages or surpluses are to be made effective. [3]
- Generally, formal manpower analysis is performed at the higher echelon staff levels, usually by officers assigned specifically as manpower analysts. If manpower analysis is performed at the activity level, it is usually by personnel who happen to use manpower analysis techniques because of previous work experience in that area. An activity's manpower analyst should have an understanding of the complexity of the command's operational mission and administrative support requirements.[4]
- Manpower planning and analysis may have worked in the past, whether through anticipating a forecast demand for skills irrespective of market signals, or through determining rates of return to educational levels in order to make largely spurious comparisons both inter-and-intra-sectorally, current thinking takes a different line. Corresponding to the increased emphasis put on market-oriented systems of resource allocation, current slogans in manpower analysis pinpoint such concepts as transparency in labour markets and reward systems, and

flexibility of acquired education and training rather than numerical accuracy in forecasting. They also strongly play down the role of the government, and suggest especially that publically subsidizing skill acquisition is not necessary. [5]

1.3 RATIONALE FOR STUDY

The concept that the right person should be employed at the right place and at the right time is vitally important to a business as it includes a wide and comprehensive range of activities in relation to “the management of man” while it entails man power planning, at the same time, being focused on the effective utilization of existing human element as well as fulfilling future needs of manpower in the organizations whenever the situations necessitate.

1.4 SIGNIFICANCE OF STUDY

Manpower Analysis and Audit basically aims to track down the daily routine and find out the main jobs and time spent on each job. By this one can find their productivity and after that some Bench Mark can be kept to utilise them efficiently.

1.5 OPERATIONAL DEFINITION ^[6]

1.5.1 Productivity- it is defined as the ratio of the output(s) that is produced to the input(s) that is used.

1.5.2 Manpower analysis- the process by which an activity’s personnel assets are matched to or balanced against authorized tasks to determine strengths and weaknesses in manning structures.

1.6 OBJECTIVES

- To calculate approximate productivity of the technicians
- To find out methods for better utilisation of the staff

1.7 METHODOLOGY

1.7.1 Study area: Cath Lab & Dialysis Department,

Wockhardt Hospitals, Nashik, Maharashtra

1.7.2 Study duration: 1.5 months

1.7.3 Study design: Quantitative cross sectional analytical study

1.7.4 Study population: All the technicians

1.7.5 Data collection: Primary data is collected through observation and data recording i.e. Time Motion Study (*Annexure 01, 02 & 03*)

1.7.6 Data analysis: Data was analyzed through statistical method

1.8 ADDITIONAL ANALYSIS

- What resources are required at each management level of an activity to support improve manpower productivity?
- What additional roles and responsibilities can be addressed with this system and what modifications will be required to improve manpower engagement?

1.9 ETHICAL CONSIDERATIONS

- Confidentiality will be ensured.
- Respect of people's right, dignity, diversity and time
- Ensure that the study does not affect the working and functioning of the hospital

1.10 LIMITATIONS OF STUDY

- Since hospital setting is a service industry thus bias in terms of observation and defining all the activities may limit the time motion analysis.
- Productivity analysis of employees in service industry is difficult to measure as compared to manufacturing industry.

2. STEPS IN MANPOWER PLANNING ^[7]

- (i) **Analysing the current manpower inventory-** Before a manager makes forecast of future manpower, the current manpower status has to be analysed. For this the following things have to be noted-
- Type of organization
 - Number of departments
 - Number and quantity of such departments
 - Employees in these work units
- (ii) **Making future manpower forecasts-** The forecasting techniques commonly employed by the organizations are as follows:
- **Expert Forecasts**
 - **Trend Analysis**
 - **Work Load Analysis**
 - **Work Force Analysis**
 - **Other methods:** like budget and planning analysis, regression and new venture analysis.
- (iii) **Developing employment programmes-** The employment programmes can be framed and developed accordingly, which will include recruitment, selection procedures and placement plans.
- (iv) **Design training programmes-** It is done to improve upon the skills, capabilities, knowledge of the workers.

2.1 QUANTITATIVE ASPECT ^[8]

It involves determination of the number of personnel required by the company. The number of employees is determined on the basis of work-load analysis and work-force analysis. Work-load analysis is based on production and sales budgets, time study and work scheduling. Work-force analysis is an analysis of the present manpower and its future potential.

2.2 QUALITATIVE ASPECT ^[8]

It is concerned with the determination of the type of manpower required. The quality of manpower depends upon the requirements of the job, which in turn can be determined with the help of job analysis. Job analysis is a detailed and systematic study of the job to find out the nature and qualifications of the people required for efficient performance of the job. Job analysis reveals the tasks which constitute the job, the skills and knowledge required for the successful performance of the various tasks, etc.

3. IMPORTANCE OF MANPOWER PLANNING ^[7]

- (i) **Key to managerial functions-** Human resources help in the implementation of all these managerial activities. Therefore, staffing becomes a key to all managerial functions.
- (ii) **Efficient utilization-** Setting of large scale enterprises requires management of large scale manpower. It can be effectively done through staffing function.
- (iii) **Motivation-** Staffing function also comprises of motivational programmes, i.e., incentive plans to be framed for further participation and employment of employees in a concern.
- (iv) **Better human relations-** Human relations become strong through effective control, clear communication, effective supervision and leadership in a concern.
- (v) **Higher productivity-** Higher productivity is a result of minimum wastage of time, money, efforts and energies.

4. WORKFORCE PRODUCTIVITY ^[9]

The Organisation for Economic Co-operation and Development (OECD) defines it as "the ratio of a volume measure of output to a volume measure of input". Volume measures of output are normally gross domestic product (GDP) or gross value added (GVA), expressed at constant prices i.e. adjusted for inflation.

The three most commonly used measures of input are:

1. hours worked;
2. workforce jobs; and
3. Number of people in employment.

4.1 FORMULA FOR MEASURING PRODUCTIVITY

Productivity measures are a series of inputs calculated against a series of outputs. Using productivity measures for can help you determine how to maximise the use of company's resources. Utilizing company's resources to the fullest extent possible can help achieve higher sales and revenue. Service industries can measure productivity by considering the number of tasks performed or the number of customers served in a given time period. Professional employees can keep personal time sheets to indicate the number of hours spent on a given task.

Thus, Productivity = Input/Output

where; Input= total number of hours the employee has actually worked

Output= total numbers of hours the employee is expected to work

4.2 NUMBER OF OBSERVATIONS-

After the work elements are defined, the number of observations for the desired accuracy at the desired confidence level must be determined.

The total number of observations required for effectively measuring the productivity can be determined by the formula:

$$\sigma_P = \sqrt{\frac{pq}{n}}$$

$$n = \frac{pq}{\sigma_P^2}$$

σ_P = standard error of proportion

p = percentage of idle time

q = percentage of working time

n = number of observations

CATH LAB DEPARTMENT

5.1 OVERVIEW OF THE DEPARTMENT

A catheterization laboratory or cath lab is an examination room in a hospital or clinic with diagnostic imaging equipment used to visualize the arteries of the heart and the chambers of the heart and treat any stenosis or abnormality found. It is the latest digital lab having two X-ray sources (biplane) and digital, flat panel labs.

5.1.1 LAYOUT OF THE DEPARTMENT INCLUDES

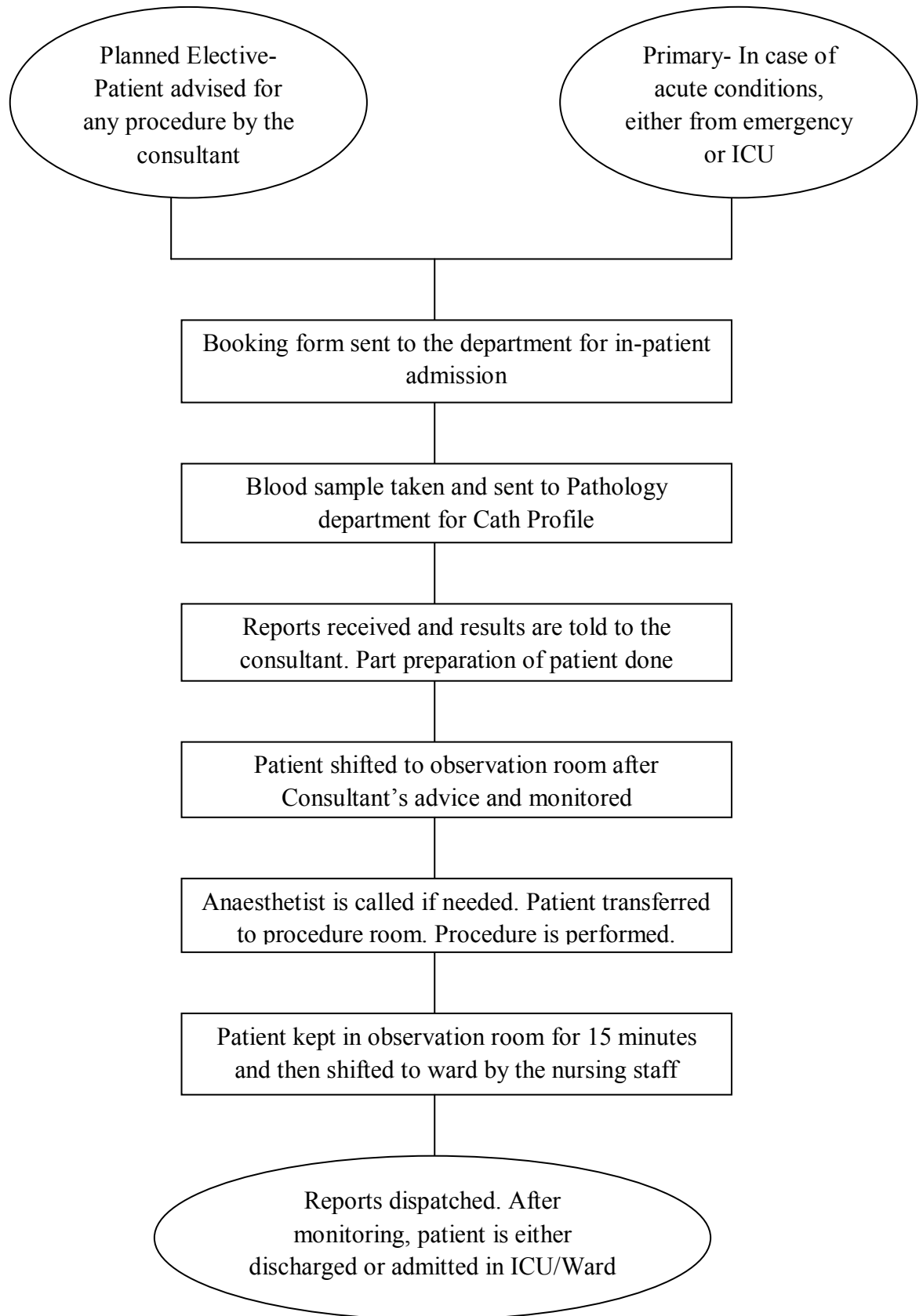
- Procedure room
- Console room
- Waiting room
- Pre and post observation area
- Consultants chamber
- Area for lab coordinator and technicians
- Scrub area
- Store room
- Male and female changing room
- Washrooms

5.1.2 SCOPE OF SERVICES PROVIDED

- Coronary Angiography
- Coronary Angioplasty
- Renal Angioplasty
- Balloon Mitral Valvoplasty
- Permanent Pacemaker (Single Chamber)
- Permanent Pacemaker (Double Chamber)
- EP Study Diagnostic
- EP Study Ablation

- Defibrillator
- Intra Atrial Balloon Pump
- Sinus Node Re-entrant Tachycardia
- Temporary Pacemaker
- Rotablation
- Fraction Flow Rate
- Check Angiography
- Catheter Directed Thrombolytic Therapy
- Attempted Coronary Angioplasty
- Thrombosuction
- Anterior Communicating Artery aneurysm Embolisation
- Other procedures related to Interventional Radiology

5.1.3 PROCESS FLOW



5.1.4 MANPOWER ALLOTMENT

The department has:

- Cardiac Consultants (2)
- RMO (1)
- Technicians (2)
- Nurses (4)
- Cath Lab Coordinator (1)
- Store Incharge (1)
- Housekeeping (1)

5.1.5 ROTA ANALYSIS & LEAVE STRUCTURE

- Technicians- General Shift (9:30am to 6:00pm)
- Cath Lab Coordinator- General Shift
- Nurses- (2) 8:00am to 4:30pm
(1) 10:00 am to 6:30pm
(1) 12 noon to 8:00pm

Leave Structure- Each employee is entitled for 6 Casual leave, 12 Sick leaves and 21 Earned leaves in a year.

- Any of the procedures done between 8:00pm to 8:00am is defined as an **'Emergency Case'** where the staffs are on-call. Compensation during such cases include:

For angiography- 300/- divided equally among the team

For any other procedure- 1200/- divided equally among the team

- **Compensatory off-** for any extra times the technician has worked, 1 compensatory off can be availed in exchange of 4 hours worked.

5.1.6 ON- CALL DATA (past 6 months)

- February 2015- 2 cases
- January 2015- 3 cases
- December 2014- 6 cases
- November 2014- no case
- October 2014- 10 cases

On call emergencies usually arrive in cases of primary where patient develops acute MI, Angina or sudden attack requiring immediate cardiac intervention. In such cases, according to the protocol the **on-call team** consists of:

- 1 Consultant
- 1 Technician
- 2 Nurses (1 Circulatory and 1 Scrub)
- 1 Associate from Stores

5.2 ANALYSIS

Input includes- Clinical + Administrative activities

Clinical Activities	Administrative Activities
Changing & Scrubbing	Drafting the reports (manual)
In procedure room	Checking work mails
Preparation of the patient	Maintaining various records
With consultant while patient counselling or case discussions	Working on data of console room & CD preparation
	Checking expiry of consumables

5.2.1 WORK LOAD AND PROCEDURES (past 6 months data)

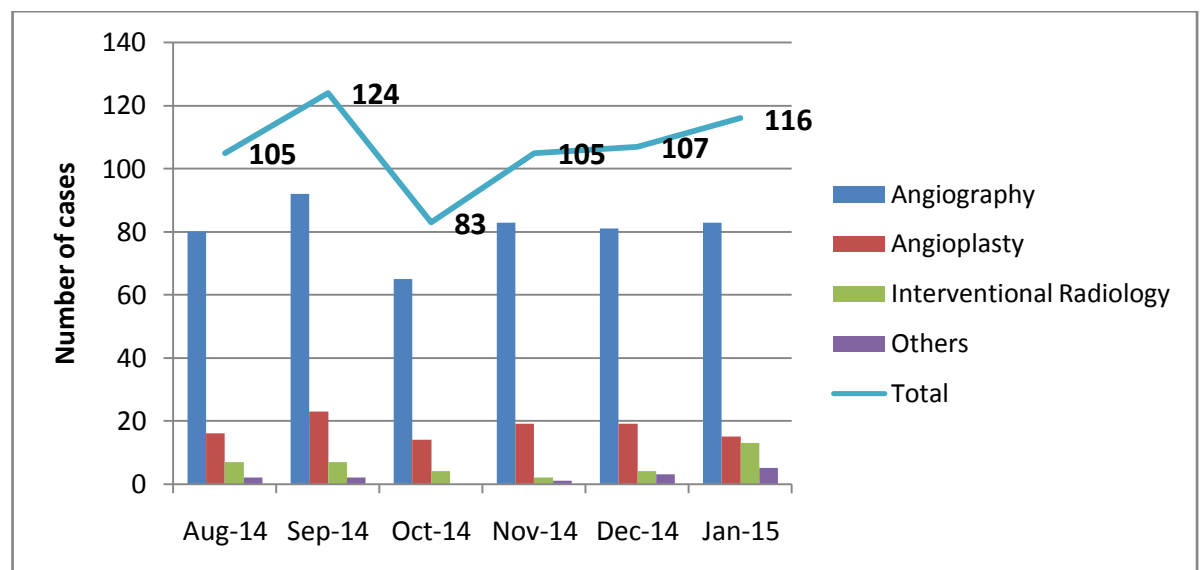


Figure 5.2.1 shows that there is consistency of the Cath lab cases in last 6 months with highest number of procedures seen in September and lowest in October. Thus it can be analysed that the department can still function with the current manpower without adding any further resources in terms of man or equipment.

5.2.2 DAY WISE PROCEDURES

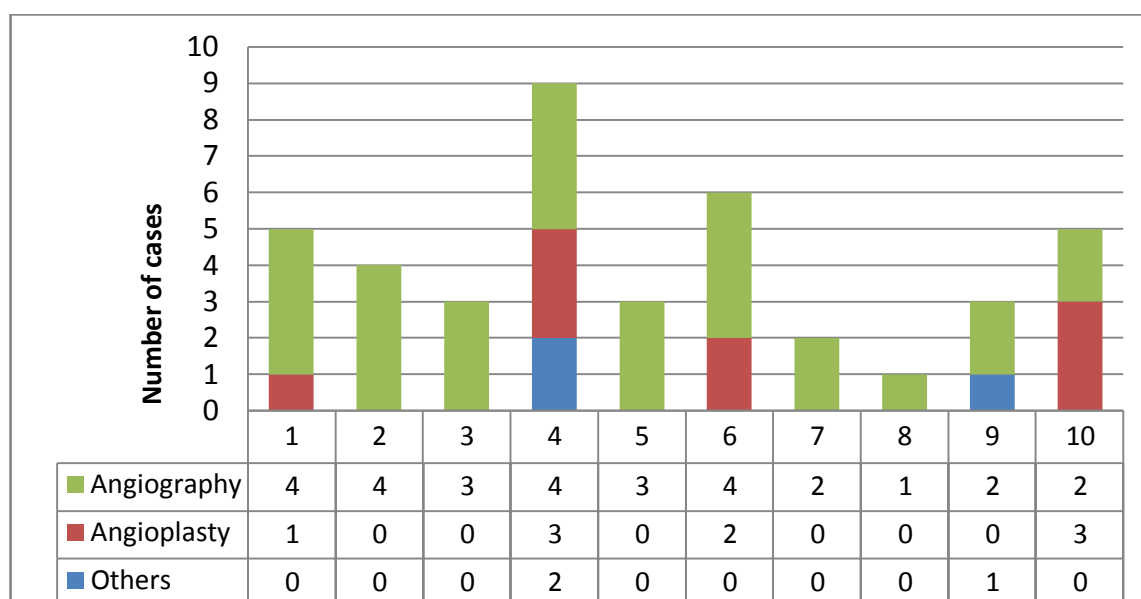


Figure 5.2.2 shows that on an average 4 cases are performed each day in the department with maximum cases consisting of angiography. Other procedure mainly includes Interventional Radiology that is mostly conducted once in every 10 days. Usually the cases of angioplasty are planned elective cases requiring 45 minutes to 1 hour while angiography procedures require 15 to 20 minutes on an average.

5.2.3 JOB DESCRIPTION OF THE TECHNICIAN

- **Qualification:** Science/Pharmacy Graduate with Basic course in Computers
- **Job Responsibilities:**
 - Obtain laboratory information, explain procedures, allay fears and elicit patient cooperation.
 - Calibrate and operate computerized equipment during procedure
 - Assist physicians in various activities
 - Clean, repair & perform preventive equipment maintenance
 - Setting room prior to procedure, preparing sterile trays and X-ray equipments with recording system

- Prepare patient for procedure
- Operate the computer for generating and entering data

5.2.4 TECHNICIAN 1- COMPARISON OF VARIOUS ACTIVITIES

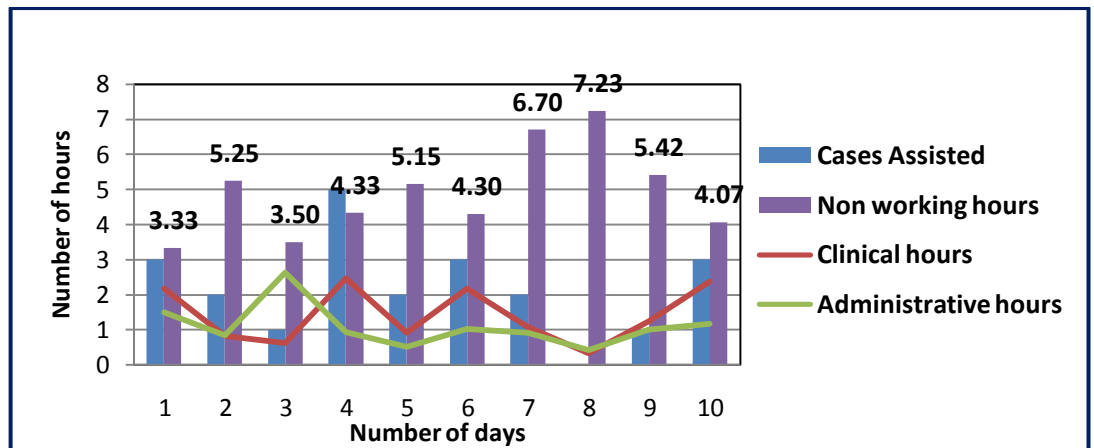


Figure 5.2.4 shows that despite the involvement of the technician 1 in the clinical and administrative activities, still the non working hours were greater than the working hours and cases assisted each day on an average includes two. Also, technician 1 is equally involved in both clinical and administrative work.

5.2.5 TECHNICIAN 2- COMPARISON OF VARIOUS ACTIVITIES

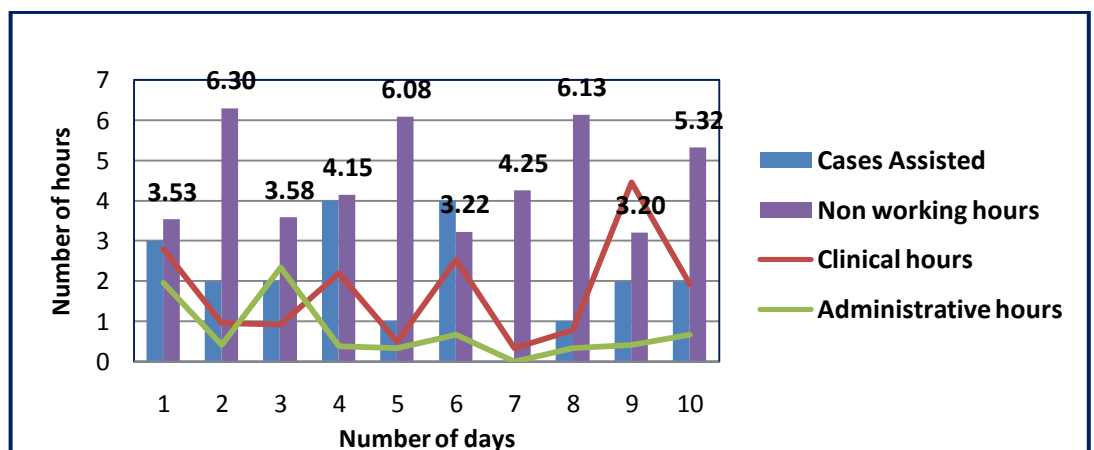


Figure 5.2.5 also shows similar result as seen in Figure 5.2.4 that the non working hours were greater than the working hours except on day 9; where the procedure included that of Permanent Pacemaker Implantation and continued for 4 hours.

Technician 2 on an average assists in 2 cases per day and is involved more in clinical

activities than administrative tasks.

5.2.6 TECHNICIAN 1- PRODUCTIVITY VERSUS IDLE TIME

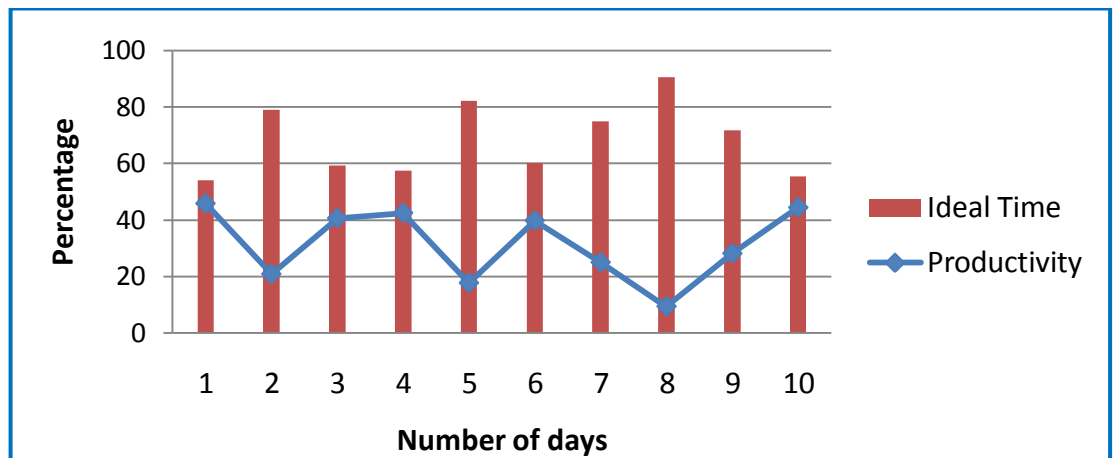


Figure 5.2.6 is a comparative analysis between the productivity percentages versus the percentage of idle time spend each day. Each day the percentage of idle time was much higher than the productivity percentage. On an average the productivity percentage of technician 1 was calculated around 31.42%.

5.2.7 TECHNICIAN 2- PRODUCTIVITY VERSUS IDLE TIME

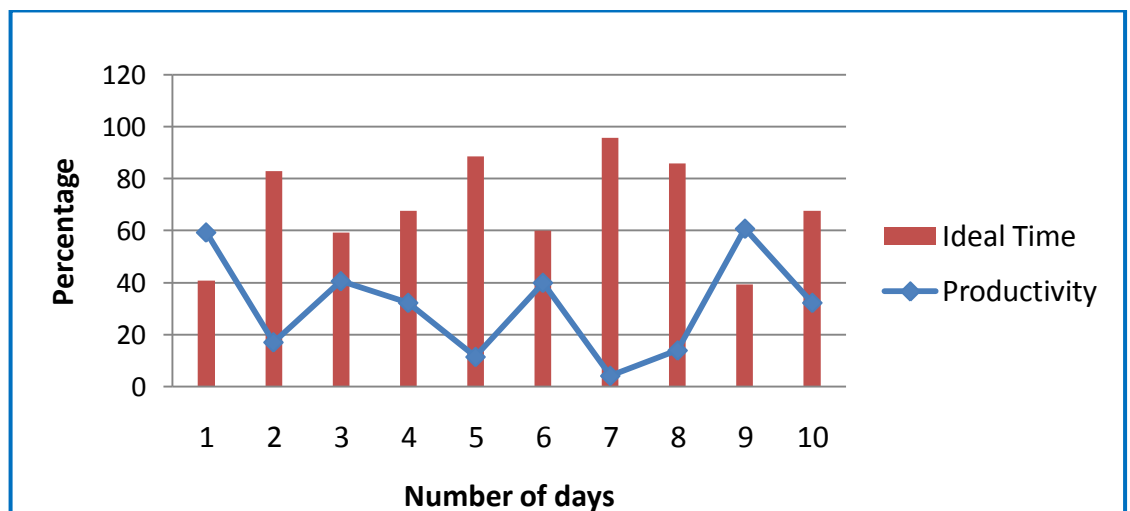


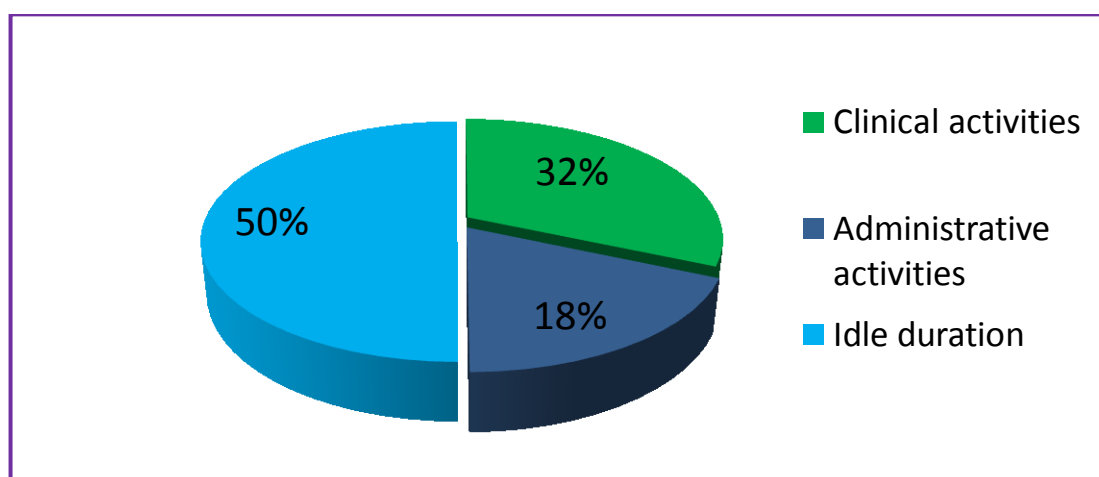
Figure 5.2.7 is also showed approximately similar results as in figure 5.2.6 where the idle time was much higher than the productivity percentages apart from day 9; due to cases of Permanent Pacemaker Implantation. On an average the productivity percentage of technician 2 was calculated around 31.21%.

5.2.8 TOTAL HOURS WORKED

Day	Technician 1		Working hours	Technician 2		Working hours
	In-time	Out-time		In-time	Out-time	
1	10:02:57	20:46:00	10:43:43	10:03:02	20:50:38	10:47:36
2	10:33:18	18:34:09	08:00:51	09:52:05	18:34:13	09:22:08
3	10:16:56	17:22:52	07:05:46	10:05:32	17:22:55	07:17:23
4	09:59:06	19:04:21	09:45:15	10:01:04	19:04:13	09:03:09
5	10:07:54	18:16:43	08:08:49	10:35:03	18:10:38	08:15:35
6	10:03:46	19:27:30	09:23:84	10:18:05	19:27:44	09:09:39
7	09:56:31	18:08:25	08:51:15	13:06:37	19:33:59	06:27:22
8	10:10:52	17:14:36	07:03:54	10:13:15	19:27:30	09:14:15
9	09:30:55	18:30:14	09:39:59	09:21:02	18:30:18	09:09:16
10	10:22:26	18:35:56	08:13:30	12:34:17	20:05:05	08:10:28

Table 5.2.8 was analysed because there was a trend of posthumous coming to the department which was observed between both the technicians. Also, when the department had no cases, they would leave early which depicts that the technicians can be engaged or utilised in better way such that the policy of working for minimum for 8.5 hours can be fulfilled. Moreover while calculating for their overtime, the under timings were missed out.

5.2.9 PERCENTAGE DISTRIBUTION OF BROAD ACTIVITIES



When total number of cases was 41

(distributed over consecutive period of 10 days)

Figure 5.2.9 shows that 50% of the time of the technicians is being spent on working that includes 32% clinical activities and 18% administrative activities. Approximately 50% of their every day schedule consists of non working hours which are their idle duration and hence, the organisation needs to engage them during these timings.

5.2.10 PERCENTAGE OF TIME SPENT ON VARIOUS ACTIVITIES

Changing & Scrubbing	04.58
In procedure room	12.04
With consultant	01.47
Drafting of reports (manually)	02.14
Checking work mails	02.23
Maintaing various records	00.34
Working in console room	03.61
Checking expiry of consumables	02.68
Chatting	33.01
Messaging or talking on phone	05.45
Using computer	03.33
Going outside for personal work	04.26
Absence from department	06.77
Sitting alone	08.39
Lunch & Tea break	09.62

Table 5.2.10 shows the percentage distribution of time that the technicians spend in doing the various activities. The highest time spend is on chatting which is about 33.01% and second highest idle activity is taking lunch and tea breaks which is 9.62%. It was also seen that none of the technicians were involved in preparation of the patient which was one of their duties as mentioned in their job description. Also, their computer skills were not being utilised.

5.2.11 AVERAGE TIME SPEND ON ACTIVITIES PER DAY

Activities	Probable Ideal Time	Technician 1	Technician 2
Changing & Scrubbing	20	21	18
In procedure room	-	58	74
With consultant (patient counselling/discussion)	-	7	7
Drafting of reports (manually)	10	12	8
Checking work mails	15	18	3
Maintaining various records	5	3	0
Working in console room & CD preparation	15	17	16
Checking expiry of consumables	Not a daily activity	3 hours	
Chatting	<u>Ideal time</u> Tech 1- 5.18 hours Tech 2- 5.35 hours	157	144
Messaging or talking on phone		25	30
Using computer		24	6
Going outside for personal work		18	21
Absence from department		22	60

Sitting alone		41	36
Lunch & Tea break	30	44	46

Table 5.2.11 is the representation of Table 5.2.10 in calculating the average time in minutes that the technician spend on each activity on a per day basis. The clinical and the administrative activities were given a probable ideal duration which any person would take if not interrupted with any other activity or not involved in any non working activity. Out of 8.5 hours the technician are expected to serve, roughly 5.26 hours on an average if their idle time.

5.3 AVERAGE TIME SPEND ON ACTIVITIES (in minutes) – CUSTOMER CARE

Activities	Probable Ideal Time	Actual Time
Record updating (cases done)	10	12
Sending reports online	10	11
Drafting reports & prints	20	30
Counselling of patient relatives	10	10
Cross department work	30	40
Coordinating with marketing department	5	5
Coordinating with billing department	5	6
Coordinating with Consultant/Technician	5	10
Preparing estimates	10	14
Checking work e-mails	15	28
Sending mails & problem solving	15	25
Answering phone calls and queries	45	45
Others (emergency data, indicators, question form filling)	5	10

Chatting	Ideal Time 3.35 hours	97
Talking or messaging on phone		36
Using computer		21
Absence from department		17
Going to cross departments		6
Lunch/Tea	30	60

Table 5.3 shows the analyses of time spend on various activities by the Customer Care Coordinator since most of the administrative work were performed by her. As compared to the work load and various works she perform, still her ideal duration was 3.35 hours. Also, most of her activities included those responsibilities that were mentioned in the job description of the technicians.

5.3.1 PRODUCTIVITY ANALYSIS- CUSTOMER CARE

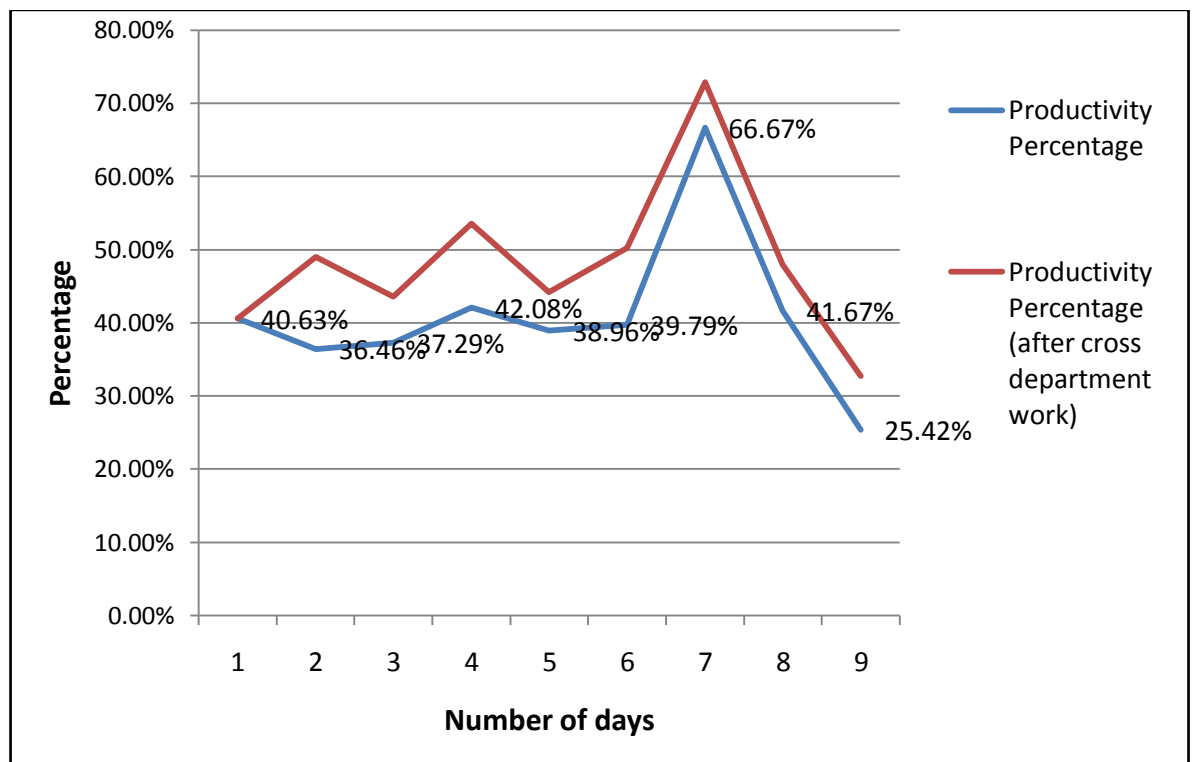


Table 5.3.1 shows the productivity of the Customer Care Coordinator which was around 40.53%. She was also handling few of the responsibilities of Operation Room that included maintain the data of on-time start of the OR cases; on which she use to spend

about 1 hour each day. So, after including that activity her productivity was around 47.25% which further gives the scope of better utilisation of the Coordinator.

5.4 ISSUES AND RECOMMENDATIONS

ISSUES:

- Increased idle time of technicians as seen from the analysis
- Functional start of the department dependent upon consultant & cases (mostly around 10:30am)
- Technicians not involved in preparation of the patient and go in the procedure room after the consultant has punctured for the case.
- Also, the computer skills of the technicians are not being utilised
- Posthumous trend seen during in-time record of the technicians. (analysed from past 3 months data).
- While calculating the overtime hours, the under time hours worked are being missed out.
- Concept of Continuous Quality Management and Patient Safety
- There is no calling system inside the procedure room. At times it is the technician who comes out of the procedure room to fetch any consumables. (a question on hygiene and safety as well)
- If there is no case, the department is closed around 6:00 pm and hence the nursing staff on duty roster of 12noon to 8pm is relatively idle.

RECOMMENDATIONS:

- ☞ Change in ROTA of technicians from 10am to 7pm.
- ☞ Since clinical activities are dependent on number of cases, we can involve them in daily administrative activities.
- ☞ Productivity of Customer Care Coordinator was also analyzed to be approximately 41%. We can utilise her in departments with increased work flow
- ☞ Technicians can be utilised in doing computer tasks.
- ☞ While calculating the extra time worked, consideration to calculate the under time worked shall also be calculated accordingly.
- ☞ Vigilant system for incident reporting

- ☞ A good statistical model makes procedure times more predictable by making a more accurate estimation of the procedural duration. Next, it helps manage the variation where the goal is to contribute to reliable schedules. The chances of overused lab time and cancelled cases are reduced. Reducing overtime is important, because overtime is costly.
- ☞ Multiple computer drops should be installed at the time of construction or renovation, even if there is not an immediate plan to install terminals. Likewise, at least one phone line into the procedure room itself is recommended
- ☞ The nursing staff on duty hours from 12 noon to 8pm can be changed according to the functional hours of the department.

DIALYSIS DEPARTMENT

6.1 OVERVIEW OF THE DEPARTMENT

Dialysis is a process for removing waste and excess water from the blood, and is used primarily as an artificial replacement for lost kidney function in people with renal failure. The Dialysis department of our hospital consists of 10 dialysis machines for OPD cases and 1 machine for IPD/ICU/Emergency cases.

The department is located on 1st level with its expansion unit on 2nd level.

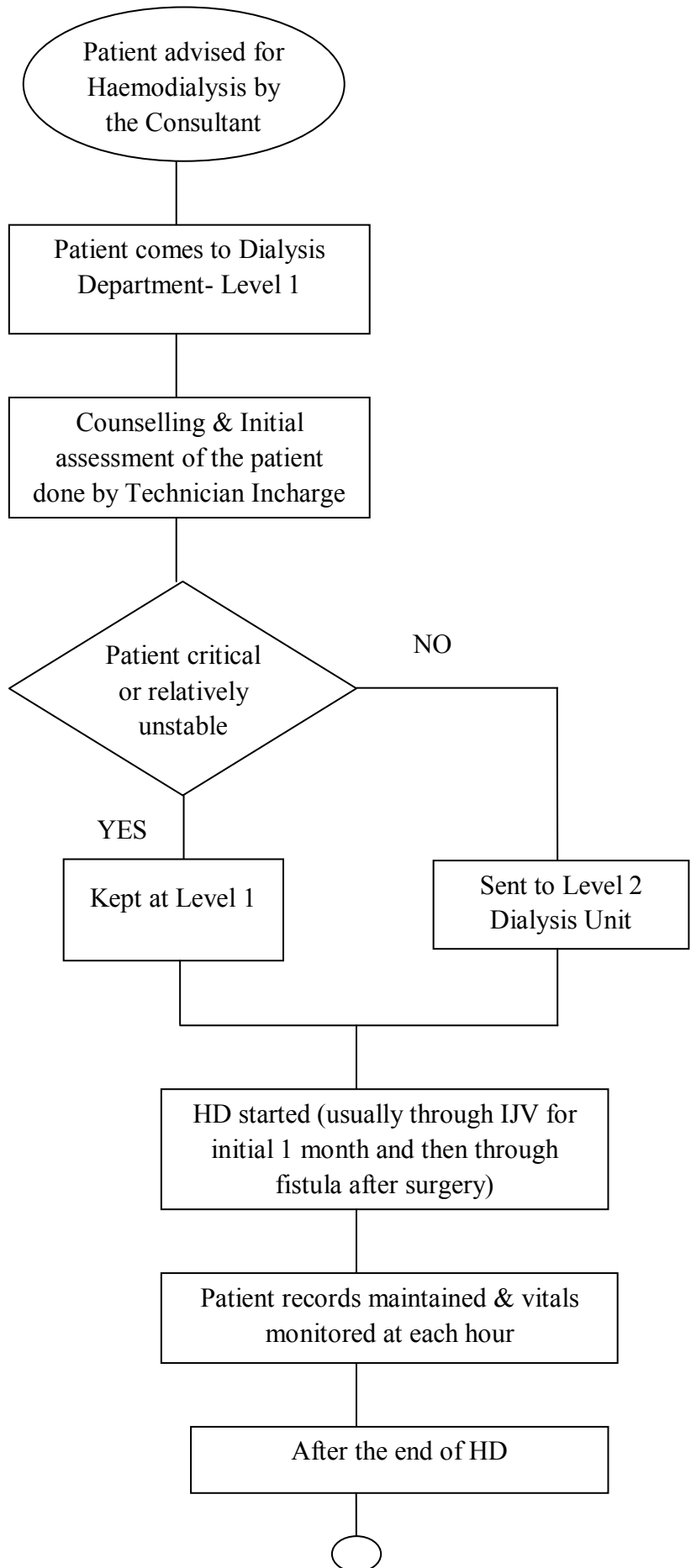
6.1.1 LAYOUT THE DEPARTMENT INCLUDES

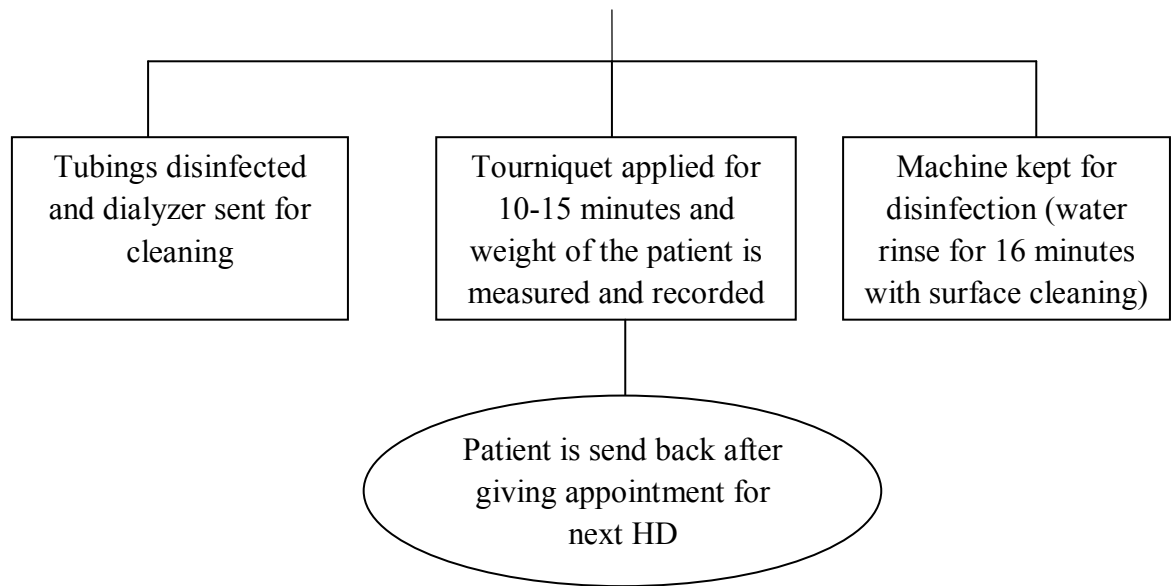
- Clinical area (for haemodialysis)
- Fluid preparation area
- Washing area (separate for positive and negative cases)
- Store room
- Technician/Nursing Station area
- Washroom

6.1.2 SCOPE OF SERVICES PROVIDED

- Haemodialysis (OP cases)
- Haemodialysis for non-ambulatory patients (requiring immediate treatment in cases of acute renal failure or injury)
- SLED (Sustained Low Efficiency Dialysis)
- Plasma Pheresis
- Uro-flowmetry diagnostic test

6.1.3 PROCESS FLOW





6.1.4 MANPOWER ALLOTMENT

The department has:

- 1 full time & 3 part time Consultant
- 1 RMO
- 10 Technicians (including Incharge)
- 1 Nurse
- 1 Housekeeping (per shift)
- 1 Washer

6.1.5 JOB DESCRIPTION OF THE TECHNICIANS

- Assemble & set up dialysis machine
- Pre evaluation, verification & assessment of all patients
- Responsible for all the procedures during dialysis
- Responding to machine alarms & patient calls
- BLS trained & capable of responding to emergencies.

- Removal, retrieval and preparation of dialyzer for reuse
- Restock consumed supplies
- Checking completeness of records
- Providing data of all dialysis patients to admin as & when required

6.1.6 ROTA ANALYSIS AND LEAVE STRUCTURE

- Technician Incharge- General shift
- 2+1 technicians in morning shift (6:30am-2:30pm)
- 2+1 technicians in evening shift (2:30pm-10:30pm)
- 1 technician in night shift (8:00pm-8:00am)
- 1 on week off/ evening shift (3:30pm-9:30pm)
- 1 technician (recently joined)- General shift

Leave Structure - Each employee is entitled for 6 Casual leaves, 12 Sick leaves and 21 Earned leaves in a year.

6.1.7 SHIFTS OF DIALYSIS PATIENTS

Dialysis department has four slots for dialysis patients (4 hours each). They include:

1st shift- 06:30am to 10:30pm

2nd shift- 12:00pm to 04:00pm

3rd shift- 05:30pm to 09:30pm

4th shift- 11:00pm to 03:00am

- Level 2 run only 3 shifts

6.2 ANALYSIS

Input includes- Clinical + Administrative activities

Clinical Activities	Administrative Activities
Setting the machine	Updating patient files (manual)
Part preparation to start of dialysis	Maintain various registers
Terminating the process	Answering queries on phone
Counselling of patients	Follow up of patients
Administering drugs	Updating records on computer
Checking vitals	Sending & Checking work mails
Responding to patient complications	
Monitoring of patients	
Collecting blood samples	
Washing & Scrubbing hands	

6.2.1 TOTAL PROCEDURES (past 6 months)

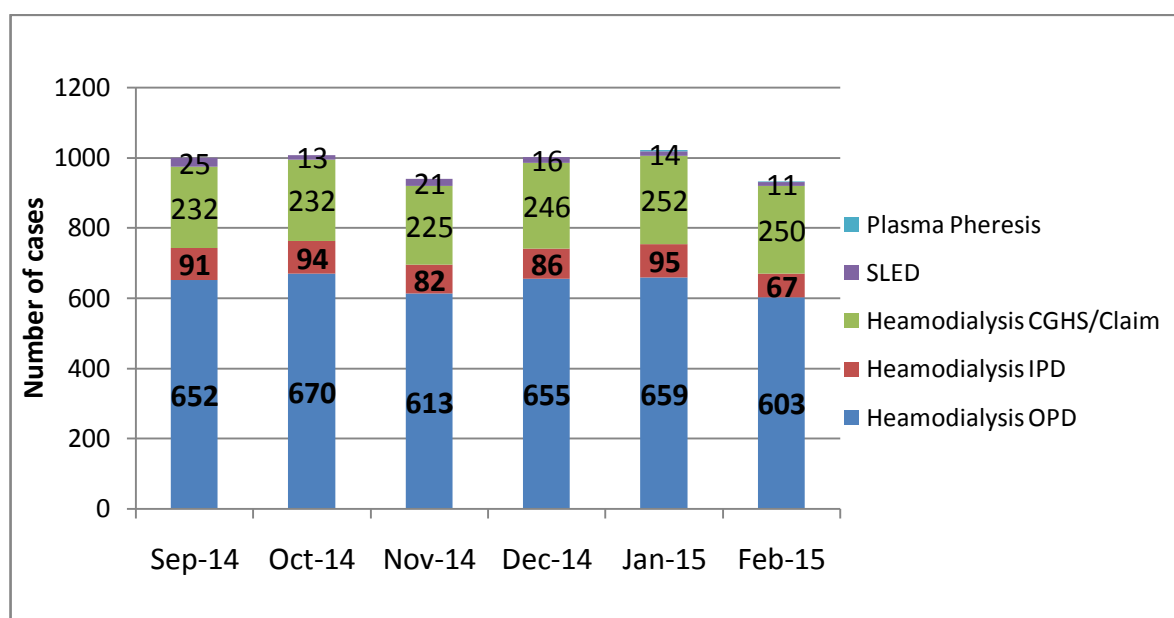
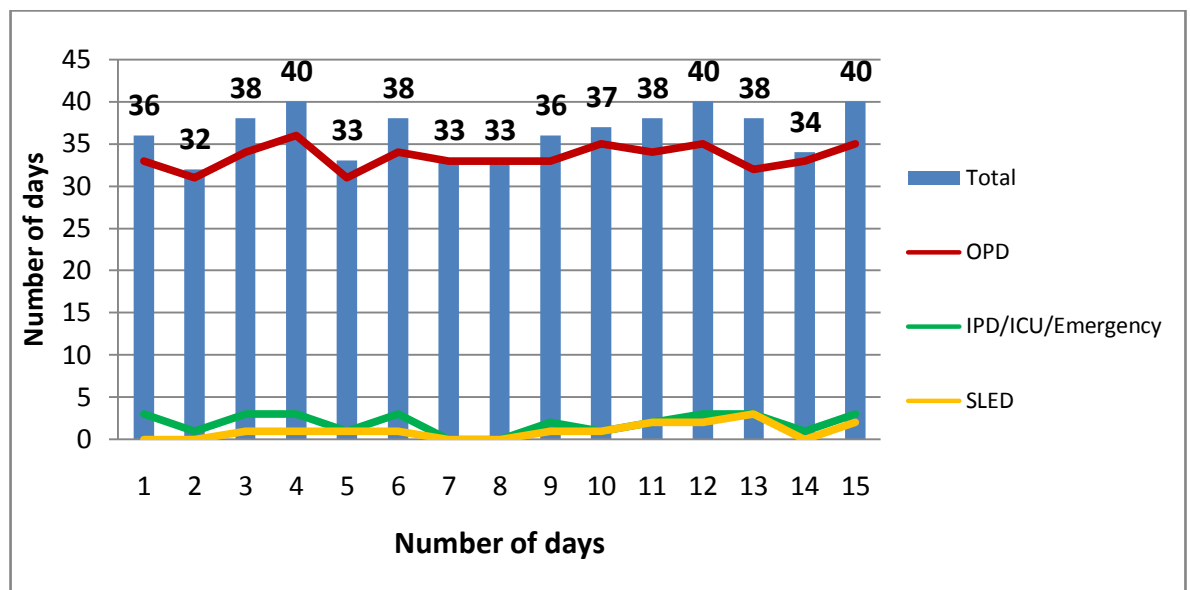


Figure 6.2.1 shows the total procedures that were performed by dialysis technicians over the last 6 months; out of which most of the cases consists of OPD based Haemodialysis. There was an increase trend of the cases that was seen each month apart from February due to less number of days.

6.2.2 PER DAY PROCEDURES AND WORK LOAD

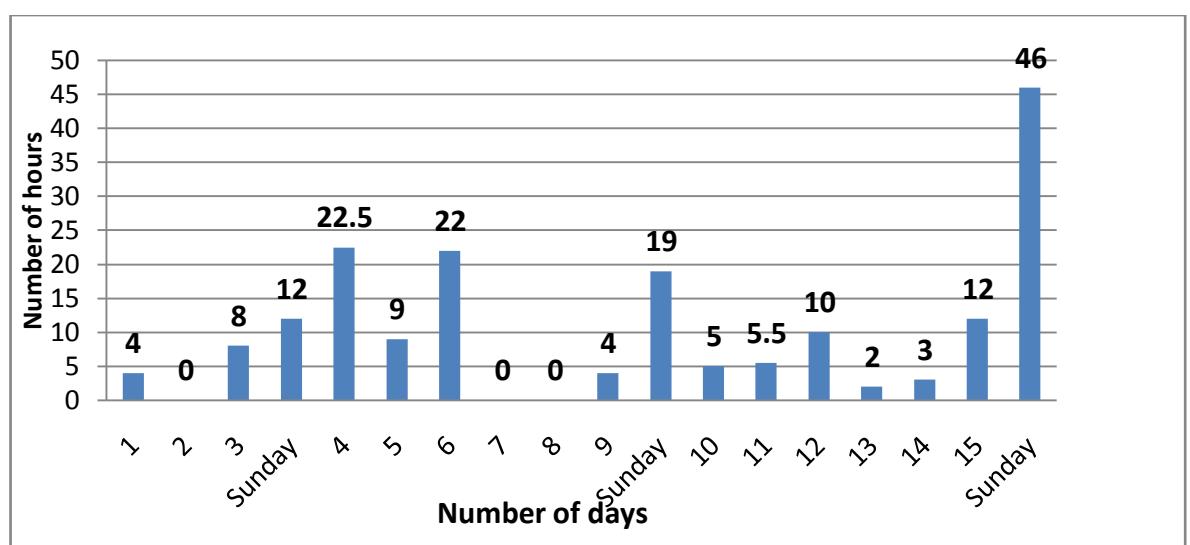


Distributed over a period of 15 consecutive days

11 machines on 3 shifts- 33 patients each day (Planned)

Figure 6.2.2 shows the per day work load of the dialysis department that was observed during 15 consecutive days of study. On an average 36 cases are performed each days which shows that all the machines are utilised more than 100%. Also, the work load is more as compared to the planned work.

6.2.3 OVERTIME PER DAY



Overtime in last 18 days (including Sunday) is around 184 hours.

Utilising our 10th technician in a better way will give his 144 hours

Figure 6.2.3 shows the overtime that the technicians work on daily basis due to increases patient flow. Maximum overtime is usually seen on Sundays due to work off of all the technicians. Also, since there is no duty roster for night shift and the department also runs a fourth shift; therefore, the technicians are paid overtime every day.

7.2.4 PATIENT TECHNICIAN RATIO

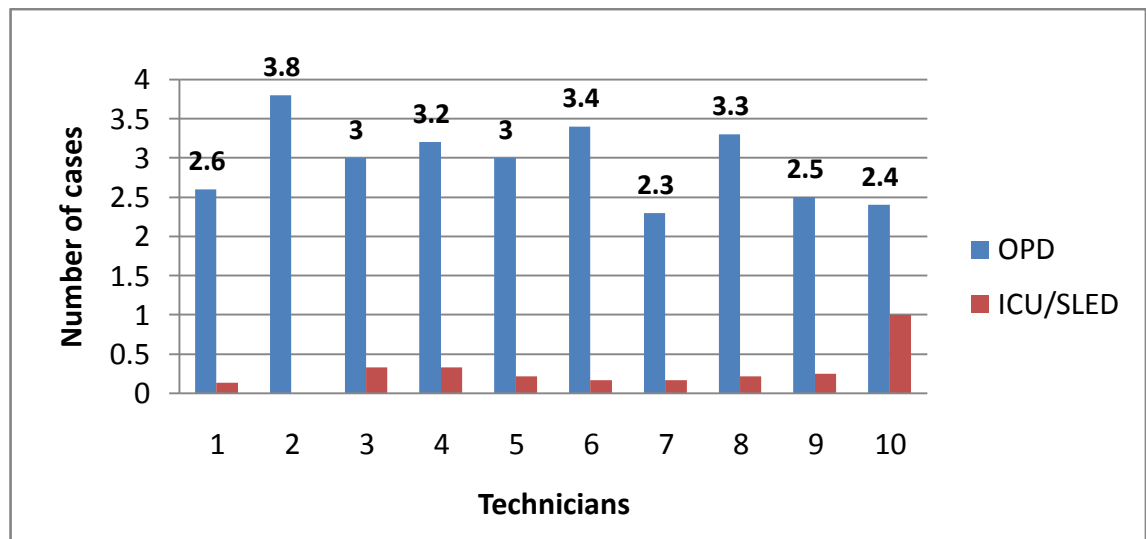


Figure 6.2.4 shows the average number of patients a technician handles in a day on OPD as well as IPD basis. A patient is counted as half when the procedure is started by one technician and termination of the process is done by another. This occurs during change of shifts or the technician has to go to ICU for another case. The procedure of SLED usually requires 6-8 hours depending upon the case.

7.2.5 PERCENTAGE DISTRIBUTION OF BROAD ACTIVITIES

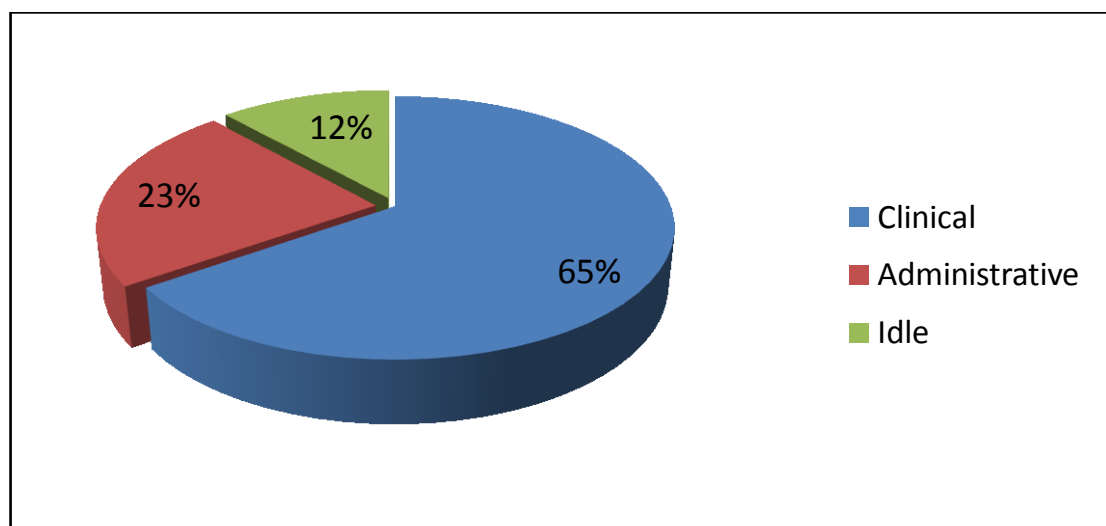


Figure 6.2.5 shows that 77% of the time of the technicians is being spent on working that includes 65% clinical activities and 23% administrative activities. Approximately 12% of their daily schedule consists of non working hours that are their idle duration that mostly includes sitting alone, watching television or chatting.

6.2.6 PERCENTAGE OF TIME SPENT ON VARIOUS ACTIVITIES

Setting the machine	8.98
Part preparation to start of dialysis	13.97
Terminating the process	10.18
Counselling of patients	3.54
Administering drugs	1.70
Checking vitals	6.35
Responding to patient complications	8.05
Monitoring of patients	7.14
Collecting blood samples	0.93
Washing & Scrubbing hands	3.34
Updating patient files (manual)	6.01
Maintain various registers	3.74
Answering queries on phone	4.04
Follow up of patients	2.60
Updating records on computer	3.34
Sending & Checking work mails	1.67
Chatting	2.46
Talking or messaging on phone	3.76
Watching television	1.99
Sitting alone	3.27
Breakfast/Lunch/Dinner/Tea	2.94

Table 6.2.6 shows the percentage distribution of time that the technicians spend in doing the various activities. The highest time spend is on preparing the part of patient to start of dialysis which is about 13.97% and second highest activity is terminating the process of haemodialysis which is 10.18%. Since the machines for dialysis are very sensitive for any minute blood change occurring in patient, hence the technicians also spend most of the time in responding to patient complications and monitoring them.

6.2.7 AVERAGE TIME SPEND ON EACH ACTIVITY (in minutes)

Activities	Probable Ideal Time	Actual Time
Setting the machine	10	9.6
Part preparation to dialysis	16	20.3
Terminating the process	11	12.5
Counselling the patients	-	3.8
Administering of drugs	2	1.8
Checking vitals	5	8.9
Responding to patient complications	-	8.6
Monitoring of patients	-	15.8
Collecting blood samples	1	1.0
Washing & Scrubbing hands	1	2.2
Updating patient files	15	14.4
Maintaining various records	10	8.6
Answering queries on phone	-	4.3
Follow up of patients	5	4.5
Updating computer records	5	15.8
Sending & Checking work mails	10	12.3

Chatting	<u>Ideal Time</u> <u>52.1 minutes</u>	10.4
Talking or messaging on phone		16.8
Watching Television		9.8
Sitting alone		15.1
Break for food/snacks	30	18.7

Table 6.2.7 is the representation of Table 6.2.6 in calculating the average time in minutes that the technician spend on each activity on a per day basis. The clinical and the administrative activities were given a probable ideal duration which any person would take if not interrupted with any other activity or not involved in any non working activity. On an average, 52 minutes is the ideal time of technicians of dialysis department.

6.2.8 PRODUCTIVITY VERSUS IDLE TIME

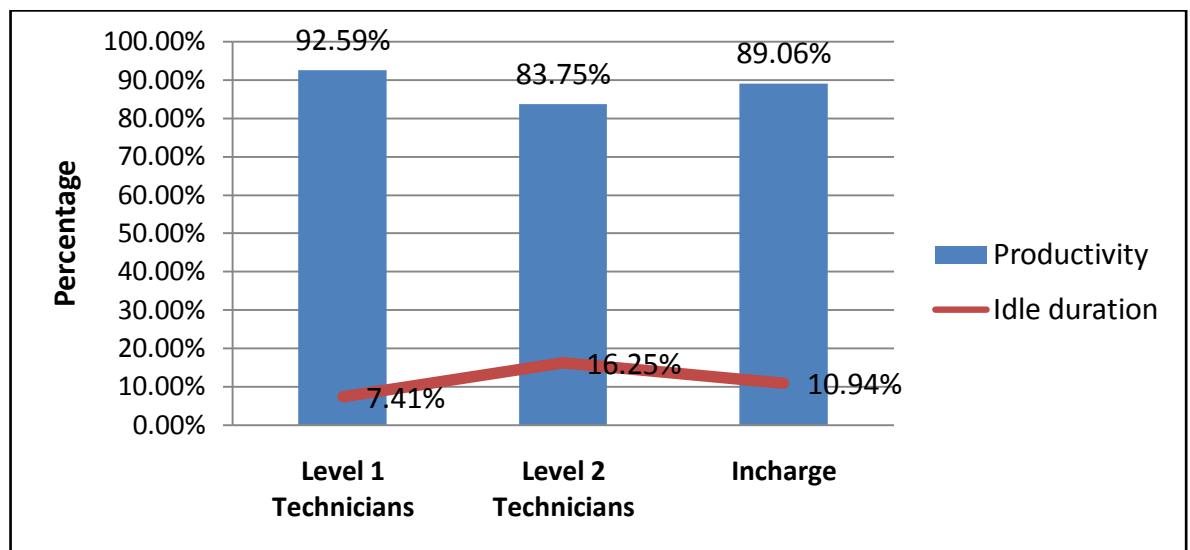


Figure 6.2.8 is the comparative analysis of the productivity percentage versus the idle time of the technicians. The highest productivity percentage was seen among technicians of Level 1; due to the reason that the critical patients are dialysed on this level and hence require more monitoring, counselling and responding to their complications. The technician incharge of the department is also given responsibilities of handling the smooth functioning of department; maintain inventory, stock verifications, daily indents of medicines and consumables, record updating, etc. hence he is more involved in doing administrative tasks.

6.3 ISSUES AND RECOMMENDATIONS

ISSUES

- i. Increased pay for overtime (due to 4th shift and Sunday shifts)
- ii. Technician going to ICU for HD or SLED is occupied only for monitoring the machine. Posthumous trend of reporting in the department by nursing staff.
- iii. Less coordination while start of cases (mainly in absence of technician incharge)
- iv. Positive patients (of HCV) are being dialysed on machines specified for negative cases. (Only 1 machine available for HCV) and machine unable to get disinfected according to protocols due to increased patient load.
- v. Increased loitering of patient relatives/guardians in the department.
- vi. Also, patient relatives & cross department people involved in watching television.
- vii. Housekeeping staff not following the protocols of managing blood spill and sweeping it with cloth.

RECOMMENDATIONS

- ☞ 1 technician- change in ROTA
- ☞ Deploying the technicians in night shift with changes in work off of each to reduce overtime on Sundays.
- ☞ During ICU cases, nursing staff can be send for monitoring the cases, such that the technician can be utilised in the department.
- ☞ Beds for each technician can be fixed- evenly distributing the work & responsibility.
- ☞ Involvement of Technician Incharge in clinical activities with rotational Team Leaders.
- ☞ 1 machine for positive cases (we also have cases for HbsAg; but are not able to dialyse)

- ☞ Extra vigilance from security staff. Restricted entry for guardians/relatives since dialysis is a critical area.
- ☞ Training of Housekeeping staff for blood spill management with sensitization of the entire staff about its importance.

7. CONCLUSION

Thus, Manpower Analysis of the Technicians working in Cath Lab and Dialysis Department showed that the productivity and utilisation can be effectively done through change in duty rosters, giving additional responsibilities, clearing ambiguity in work and training for multitasking.

Productivity can be improved by identifying potential areas. The quality of leadership in the business can have an effect on productivity, so one has to make sure that as a leader the business isn't suffering from:

- a. poor planning or scheduling of work
- b. unclear or untimely instructions to employees
- c. an ability to adjust staff size and duties during light or heavy work load periods
- d. poor coordination of material flow
- e. the unavailability of needed tools
- f. excess travel time

Ultimately, the key to improve productivity lies with the employees themselves and the way the organisation work with those employees.

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9. ANNEXURE

S.no.	CATEGORIES	ACTIVITIES	TIME							
			10-11	11-12	12-01	01-02	02-03	03-04	04-05	05-06
1	Medical	Changing & Scrubbing								
		In procedure room								
		Preparation of patient								
		With consultant while patient counselling or discussion with consultant								
2	Administrative	Drafting the reports (manual)								
		Checking work mails								
		Maintaining various records								
		Working on data of console room and CD preparation								
		Checking expiry of consumables								
3	Idle	Chatting								
		Talking or messaging on phone								
		Using computer								
		Going outside for personal work								
		Absence from department								
		Sitting alone								
4	Break	Lunch								
		Tea in canteen								

Annexure 01- Input Variables for Technicians of Cath Lab

S.no.	CATEGORIES	ACTIVITIES	TIME							
			10-11	11-12	12-01	01-02	02-03	03-04	04-05	05-06
1	Administrative	Record updation (cases done)								
		Sending reports online								
		Drafting reports & prints								
		Counselling of patient relatives								
		Cross department work								
		Cordinating with marketing deptt								
		Cordinating with billing deptt								
		Cordinating with Consultant/Technician								
		Preparing estimates								
		Checking work e-mails								
		Sending mails & problem solving								
		Answering phone calls and queries								
		Others (on call data, indicators, question form filling)								
2	Idle	Chatting								
		Talking or messaging on phone								
		Using computer								
		Going outside for personal work								
		Absence from department								
		Going to cross departments								
3	Break	Lunch								
		Tea in canteen								

Annexure 02- Input Variables for Customer Care Coordinator (Cath Lab)

S.no.	CATEGORIES	ACTIVITIES	Per hour							
			1	2	3	4	5	6	7	8
1	Clinical	Setting the machine								
		Part preparation to start of dialysis								
		Terminating the process								
		Counselling of patients								
		Administering drugs								
		Checking vitals								
		Responding to patient complications								
		Monitoring of patients								
		Collecting blood samples								
		Washing and Scrubbing hands								
2	Administrative	Updating patient files (manual)								
		Maintaining various registers (investigation, new patient, drop outs, patient complications)								
		Answering queries on phone								
		Follow up of patients (through calls)								
		Updating computer records (drug orders, indents, consumables, per day dialysis)								
		Sending & Checking work mails								
3	Idle	Chatting								
		Talking or messaging on phone								
		Watching television								
		Sitting alone								
4	Break	Breakfast/Lunch/Dinner/Tea								

Annexure 03- Input Variables for technicians of Dialysis