Summer Training at
Narayana Multispeciality Hospital, Jaipur
(April - June, 2013)

EVALUATING ASSET UTILIZATION OF DIAGNOSTIC SERVICES & PLANNING OF ELECTRONIC OUTPATIENT INPATIENT RECORDS & ICD CODING

By
Gargi Mehra

Under the guidance of
Mr. Laxman Swaroop Sharma

Post Graduate Diploma in Hospital and Health Management
2012-2014

Institute of Health Management Research,
Jaipur
2013

INSTITUTE OF HEALTH MANAGEMENT RESEARCH
1, Prabhu Dayal Marg
Sanganer Airport, JAIPUR - 302 011, INDIA
Tel. : 3924700, 2791431-32
Fax : 91-141-3924738
E-mail : iihmr@iihmr.org
URL : http://www.iihmr.org
Gram : HEALTHINST

CERTIFICATE

This is to certify that,Dr.Gargi Mehra, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management and Research, Jaipur Batch 17th has undergone summer internship in Narayana Multispeciality Hospital,Jaipur from April 8th to June 8th 2013.

The candidate has successfully carried out the projects assigned to her during summer training and her approach to projects has been sincere, scientific and analytical.

I wish her success in all her future endeavors.

Mr.Laxman Swaroop
Faculty and Mentor
IIHMR Jaipur

Dr. Ashok Kaushik
Dean ,Academic and Student affairs
IIHMR Jaipur

NH Narayana™
Multispeciality Hospital
Unit of Narayana Health

NH/HRD-Off/2013/209 **Date: 8th June 2013**

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. Gargi Mehra** has completed her Summer Internship Successfully in Narayana Hrudayalaya Hospital, Jaipur from 8th April, 2013 to 8th June 2013.

Her Work during the Period was Commendable and appreciable. Her character and conduct was good.

The project was on "Evaluating Asset Utilization of Diagnostic Services" & Planning of Electronic Outpatient Inpatient Records & ICD Coding"

We wish her success in future endeavors.

For Narayana Hrudayalaya Hospital, Jaipur

Vishnupriya Sharma
Manager-Human Resources

NARAYANA HRUDAYALAYA PVT. LTD. JAIPUR

NH Helpline 0141 5192939
Narayana Hrudayalaya Pvt. Ltd.
Sec-28, Kumbha Marg, Pratap Nagar, Jaipur 302033
Tel: +91 141 5192939 Fax: +91 141 5192940 www.narayanahealth.org

Acknowledgement

This project would not have been possible without the support of many people. I would like to extend my sincere thanks to all of them.

I wish to express my gratitude to Mr Subhasis Bhattacharya (Operations Manager,NH Jaipur),Ms Vishnupriya Sharma(HR Head,NH Jaipur)who were extremely helpful and offered invaluable support and guidance. I would also like to thank Col.Dr Ashok Kaushik (Dean, IIHMR) for his insight and guidance during this project and my mentor Prof. Laxman Swaroop(Assistant professor, IIHMR) for his support. I would like to express my gratitude towards staff of NH Jaipur for their encouragement and co-operation which helped me in completion of this project

My thanks and appreciation

Narayana Multispeciality Hospital, Jaipur

Narayana Multispeciality Hospital, Jaipur was commissioned on 29th of January 2011. In August 2012, the hospital was awarded the international accreditation from Joint Commission International (JCI) making it the first hospital in Rajasthan to receive this prestigious recognition. A JCI accreditation provides assurance that the standards, training and processes at the hospital meet the highest international benchmarks.

Organization Accredited
by Joint Commission International

The 200 bed multispeciality tertiary care hospital is located at Pratap Nagar within a sprawling campus of 4.7 acres offering high quality medical care to the people within the state of Rajasthan and bordering states as well.

Some of the core specialities at the hospital include both adult and paediatric cardiac services, orthopaedics, obstetrics & gynaecology, neurosciences, nephrology, urology and gastroenterology offering advanced treatment procedures including Laparoscopic and Minimally Invasive surgeries. We have in-house Radiology, Laboratory and Blood Bank services offering Emergency and Trauma care round the clock.

Narayana Multispeciality Hospital, Jaipur has the license to perform Medico Legal cases, which has served as a boon to patients along Tonk Road as well as other areas of Pratap Nagar, Sanganaer and Jagatpura.

With the distinction of being the fastest growing unit, the department of Woman and Child offers antenatal care, which is amongst the most sought-after Obstetrics and Gynaecological service in the city of Jaipur.

The department of Nephrology has a 16 bed dialysis unit. The team of Urologists specialising in men’s health are highly skilled and have the experience to treat kidney stone, prostate problems and infertility in men.

Narayana Multispeciality Hospital at Jaipur has expansion plans to develop into a health city campus with 3000 beds.

Vision

To provide high quality healthcare, with care and compassion, at an affordable cost, on a large scale

Values

Narayana Health's Core Values are defined by I – CARE

Innovation and efficiency – to continuously reduce cost of delivery of high quality health care and improve reach

Compassionate Care – in providing accessible care that makes a difference to our patients

Accountability – to honour our commitments with integrity and transparency to our patients, employees and investors

Respect for all – recognize the contribution of every employee and respect rights and dignity of every patient and employee

Excellence – create a culture of individually excelling to collectively ensuring highest quality of consistent, reliable service to our patients and sustainable value to all our stakeholders

INTRODUCTION-

In the present healthcare scenario increasing operational efficiency and reducing costs whilst improving service provided to the patient is a constant challenge. Knowledge of patterns in patients' diagnostic services utilisation can guide health care resource allocation

AIM OF STUDY-Assessment of utilization rates of diagnostic services.

NEED OF THE STUDY-Utilization rate of hospital's assets plays a very important role in determining whether the organization's resources are optimally utilized or not.

OBJECTIVES-

- To record the time taken for different diagnostic procedures and calculate the utilization coefficient using a preset formula.
- To see the trend of equipment utilization.
- To identify bottlenecks if any in efficient and effective utilization of diagnostic procedures and suggest corrective measures for the same.
- To calculate manpower utilization

TIME FRAME-:15 days i.e from 22nd April to 6th May

METHODOLOGY

Study design:- Cross sectional

Study area:-Non Invasive Cardiology diagnostic area Narayana Hrudyalaya.

Study population:- Primary-Patients who got themselves investigated for ECG, ECHO, TMT diagnostic services.

Secondary**:-**Patients who got themselves investigated for Ultrasonography Endoscopy, Bronchoscopy , EEG and NCV and PFT diagnostic services.

Sample size:-Primary study population size-All patients who came for investigations in the Non-Invasive Cardiology Department during the time period of study

ECG-383

ECHO-415

TMT-108

Secondary study population size

USG-478

ENDOSCOPY-50

PFT-14

BRONCHOSCOPY-8

EEG-8

NCV-6

Process and method of data collection:-

Primary data collection- Daily Observation for no. of procedures and time taken for different procedures

Secondary data collection- Information about no. of patients who came for investigations from registers and records in the department and information about time taken for different procedures through observation(5 days) and also by gaining information from technicians

CALCULATION OF UTILISATION RATE

EQUIPMENT UTILISATION

Utilisation rate=N/M*100

Where N= number of minutes the equipment is being utilized in 15 days

M=number of potential minutes available during which equipment could be utilized in 15 days.

For calculating M diagnostic services timings =9am to 5 pm

Equipment can work for 8 hours a day.

No. of minutes the equipment can work in 15 days=15*8*60=7200

MANPOWER UTILISATION

The hours of productive work as a percentage of the total work hours paid for

ECG

There is 1 ECG machine in the department.

One ECG technician carries out ECG.

The patient flow in the department is as follows

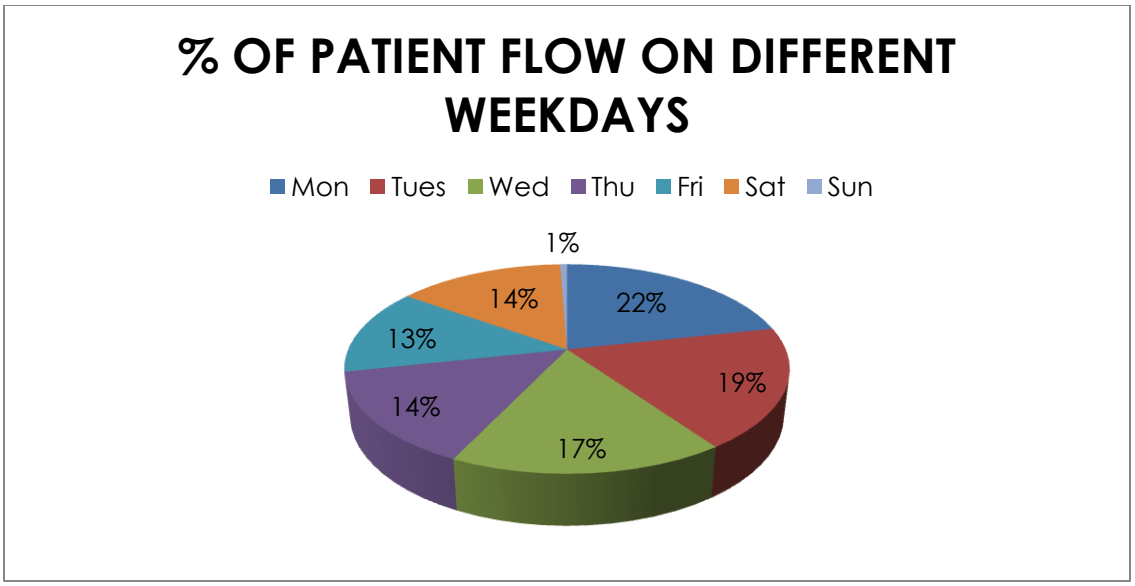
The patients observed in 15 days were 383

The number of minutes ECG was utilized in 15 days were 1032

Calculating the utilization rate by dividing it by number of minutes it could be utilized i.e 7200

The ECG Utilisation is 14.33%

Day	No.of patients(1^{st} week)	No.of patients(2^{nd} week)	Total patients
Monday	36	37	73
Tuesday	40	23	63
Wednesday	32	25	57
Thursday	25	24	49
Friday	24	21	45
Saturday	23	26	49
Sunday	2	0	2



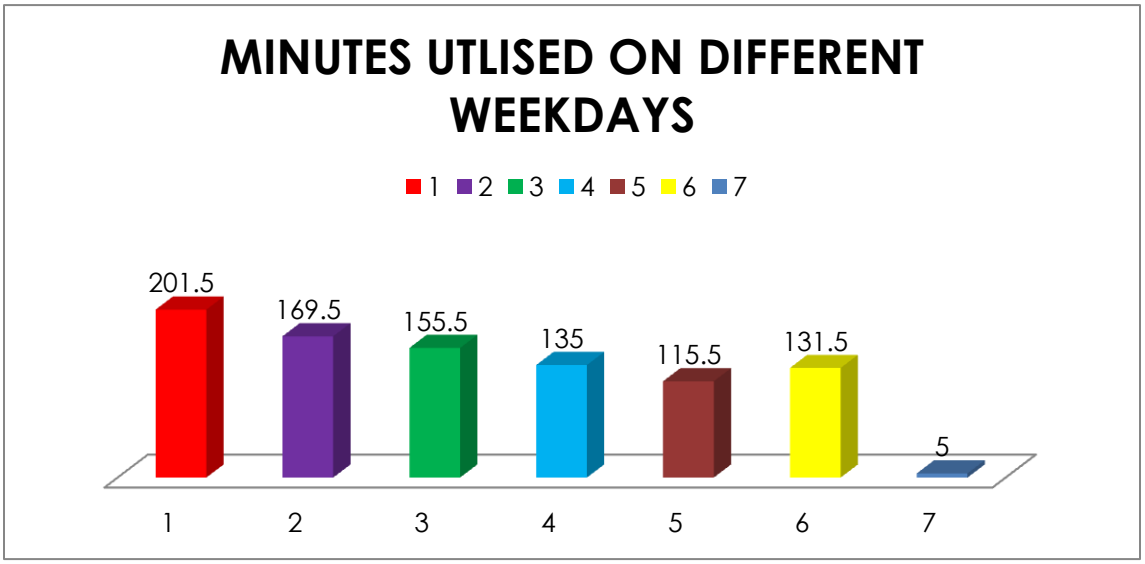


Fig 2.1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

The manpower utilization i.e of ECG Technician is Preparation time +Procedure Time+Time spent on other patient care activities/making other reports /Total paid time

= {(1032min + 20*15 min) / 7200 *100

Here 383 is the no.of ECG patients in 15 days.Time spent on other patient care activities is 20 min everyday(patient care activities)

=1332/7200 =18.5%

The manpower utilization of ECG =18.5%

TREND OF UTILISATION

The utilization of diagnostic services is maximum on Monday followed by Tuesday and Wednesday.The utilization remains almost same for Thursday, and Saturday.It is least on Sunday.

ECHO

There are two echo machines.

Dr.Ashok Jain-3min

Dr. SitaRam-20min

Dr.Kapil-5min

Dr.Alok-4min

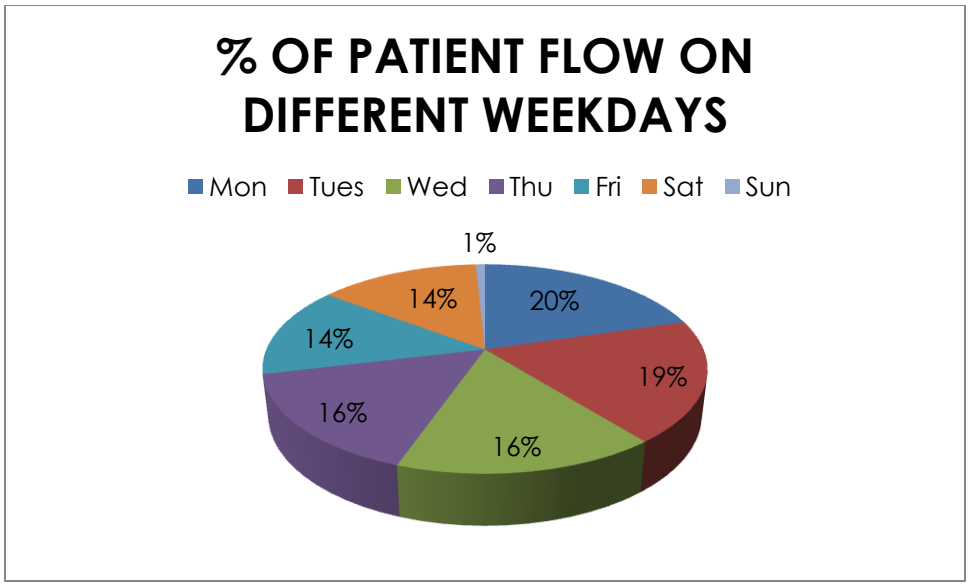
Dr Ram-4.5min

The minutes utilized in 15 days were 2423.

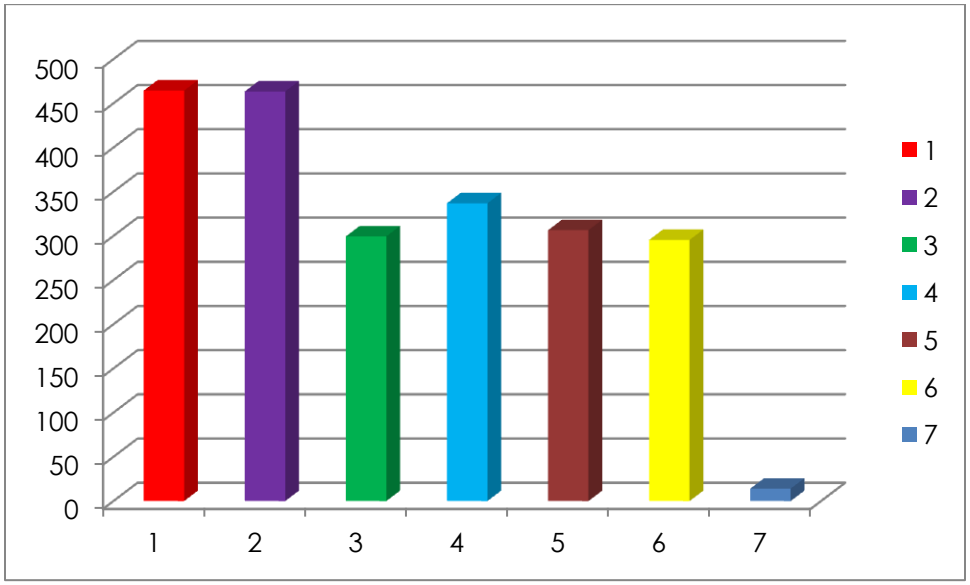
Dividing it by 7200

The utilization rate of ECHO is 16.82%.

Day	No.of Patients(1st week)	No.of Patients(2nd week)	Total Patients
Monday	39	37	76
Tuesday	34	36	70
Wednesday	37	23	60
Thursday	30	29	59
Friday	23	29	52
Saturday	25	27	52
Sunday	2	1	3



MINUTES UTILISED ON DIFFERENT WEEKDAYS



1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

Manpower Utilisation of ECHO Technician=Time taken to prepare patient for ECHO+Observing and noting down the readings as told by the Cardiologist+Making the reports /Total paid hours

=1min* 415 + 2423min + 5 min*415 /7200*2 (since there are two ECHO Technicians)

={(415+2423+2075) /14400min}*100

=34.11%

Hence the manpower utilisation for both echo technicians is 34.11% each.

TREND OF UTILISATION

The utilization of ECHO is maximum on Monday and Tuesday,followed by Thursday.It is least on Sunday.

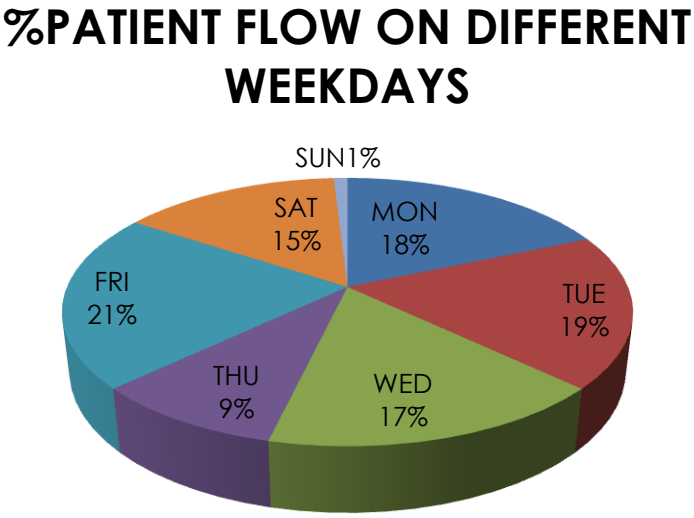
TMT

There are two TMT machines.

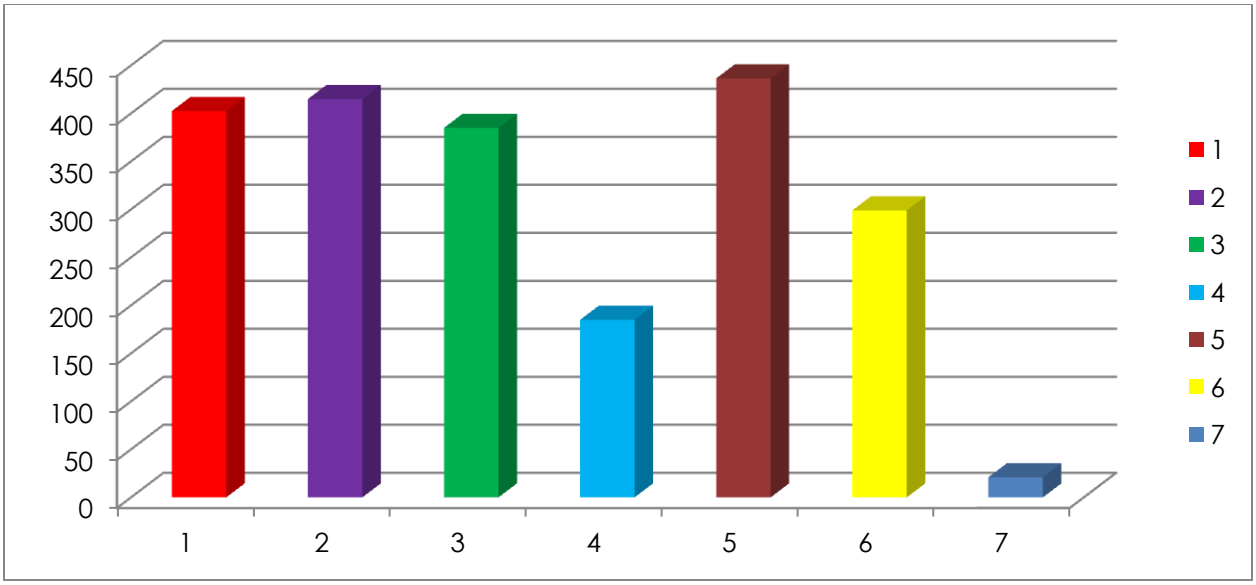
TMT machines were utilized for 2383 minutes in 15 days.

The utilization of TMT is 16.54%

Total patients observed were 108



MINUTES UTILISED ON DIFFERENT WEEKDAYS



1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

Manpower Utilisation of TMT Technician=Time taken to prepare patient +Time taken for completing TMT(as the technician has to supervise the whole procedure)+Time taken to take out the reports /Total paid time

=(5min*108 + 2383 + 2min* 108) /7200 min

={(432+2383+216min) /7200min }*100

=3031/7200 min*100=42.09%

TREND OF UTILISATION

As observed the patient flow was maximum on Tuesday.However the minutes utilized were maximum on Friday.This implies that the minutes being utilized every day depend on the type of patient and when he achieves the target heart rate.

ULTRASONOGRAPHY

There are two ultrasonography machines.

The patient flow of the department is

TIMINGS	%of Patient flow
9am -10am	20%
10am-11am	25%
11am-12pm	30%
12pm-1pm	10%
1pm-3pm	10%
3pm-5pm	5%

There are different types of ultrasonography procedures and they take different time.

Whole Abdomen-10

Upper Abdomen-7

Lower Abdomen-7

Carotid Doppler-15

USG-KUB-12

USG-TVS-11

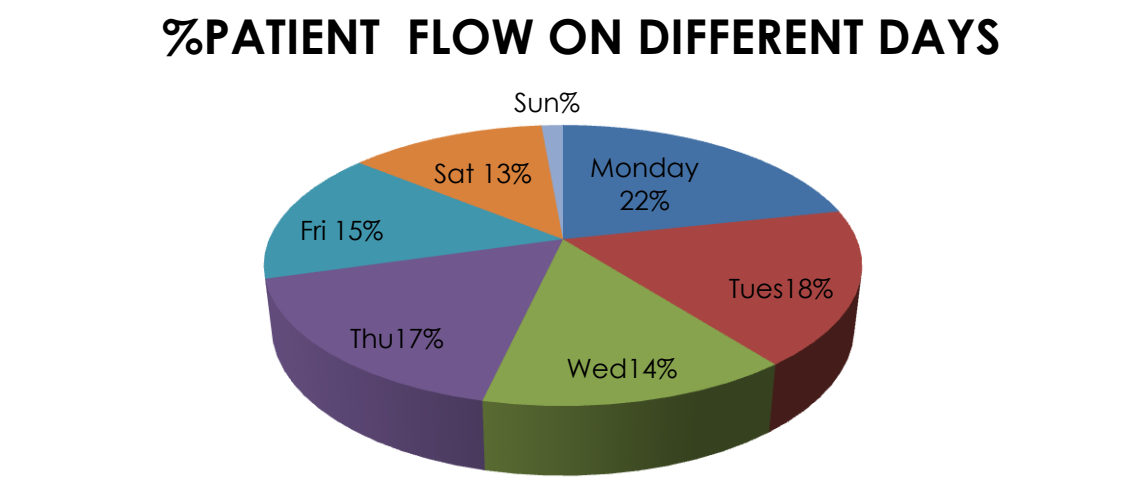
Foetal Well being-17

The ECHO machines were utilized for2667 min

The utilization rate of ultrasonography is 37.04%

The ultrasound machine in room 1 is more utilized than machine in room 2.

The waiting time of patients to get their sonography done is high.



MINUTES UTILISED ON DIFFERENT WEEKDAYS

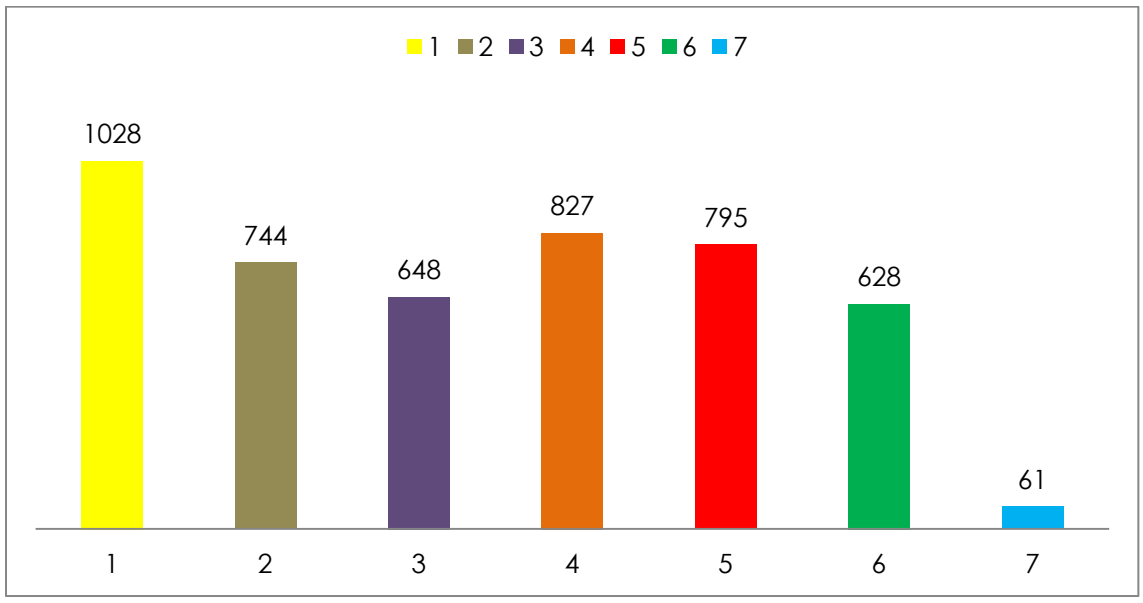


Fig 9. 1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

UTILISATION SHARE OF DIFFERENT ULTRASONOGRAPHY

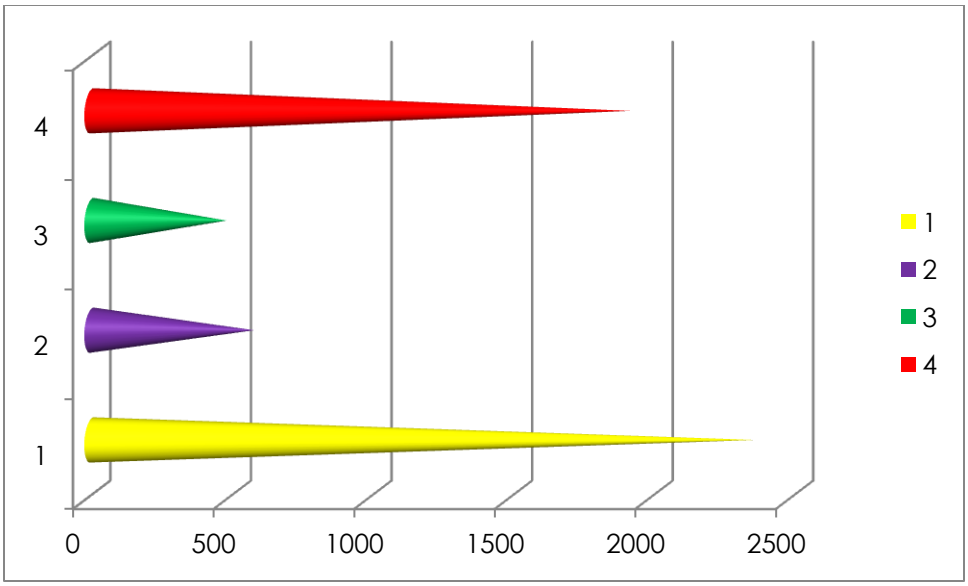


Fig 9 -1-Whole Abdomen 2-Foetal 3-Carotid Doppler 4-Others(Chest X-ray,Lower Abdomen, Upper Abdomen ,Doppler Venous ,Renal Doppler ,USG Uterus ,USG Scrotum)

The major share of utilsation time is contributed by Whole Abdomen scans.

Manpower Utilisation of sonography Technician=Time taken to make reports+ Time spent on other activities like photocopying+noting down the readings /Total paid time

={(7min*478+ 20 min*15 +25 min*15)/7200 min}* 100

={3346+300+375min /7200 min}* 100

=4021/7200 min *100 =55.8%

The patient flow is maximum on Monday followed by Tuesday.The sonography machine is utilized maximum on Monday followed by Thursday and Friday.

ENDOSCOPY

There is one endoscopy machine.

Different scopes are attached to it for different procedures like Oesophago-Gastro-Duo, Sigmoidoscopy, Colonoscopy and ERCP .

The average time taken for

Oesophago-Gastro Duo -6 min

Sigmoidoscopy-5 min

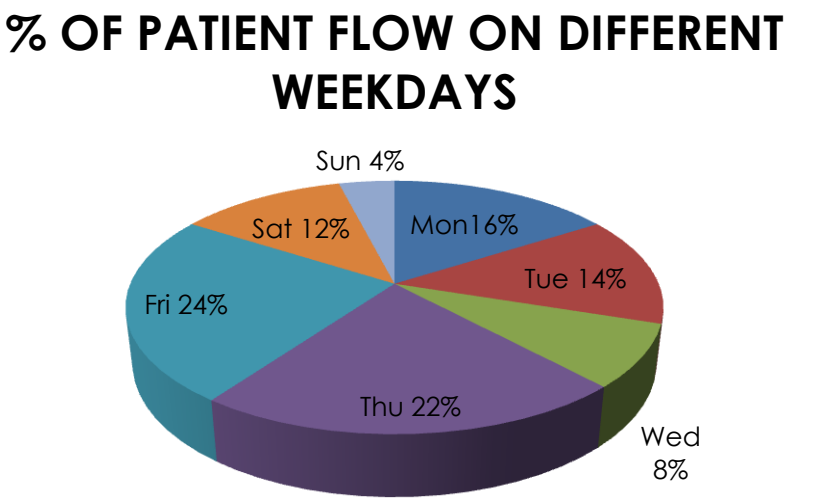
Colonoscopy-15min

There is one Endoscopy Technician,one housekeeping staff and one nursing staff in endoscopy department.

537minutes were utilized.

There were 56 patients of endoscopy cases.

The utilization of Endoscopy machine is 7.45%



MINUTES UTILISED ON DIFFERENT WEEKDAYS

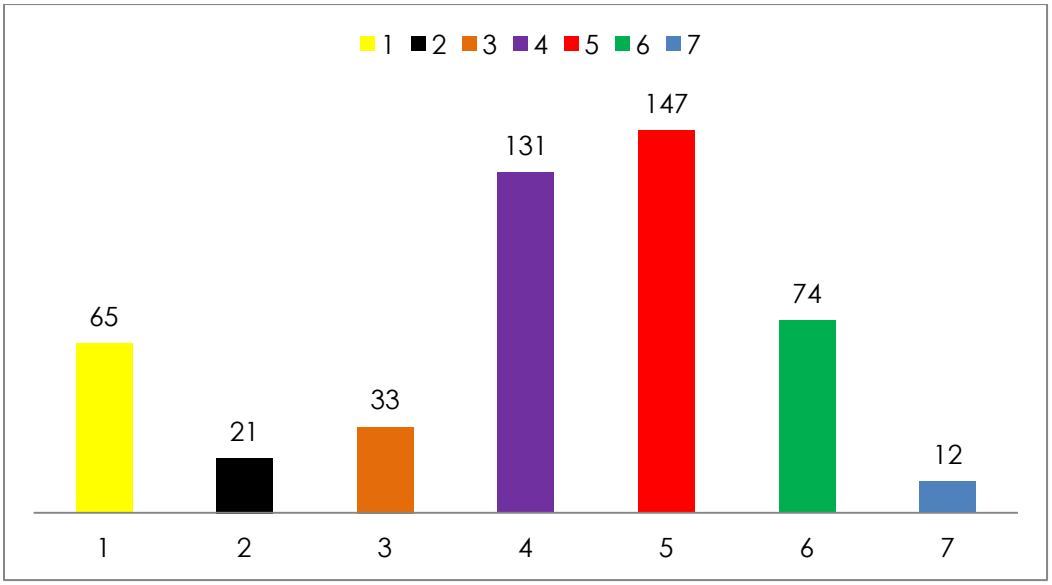
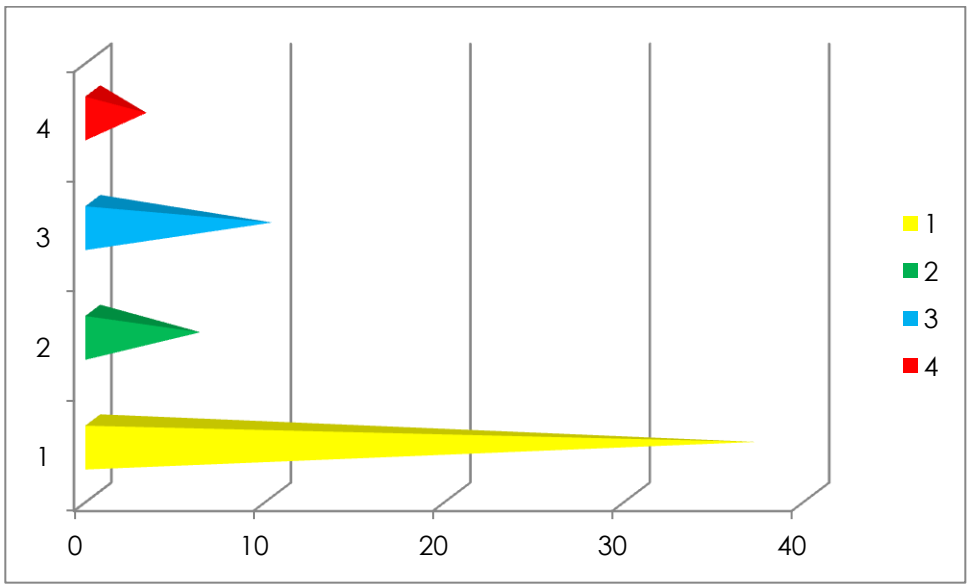


Fig 9. 1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

The patient flow is maximum on Monday .The minutes utilized are maximum on Thursday and Friday

UTILISATION SHARE OF DIFFERENT PROCEDURES IN ENDOSCOPY



1-Oesophago Gastro Duo 2-Sigmoidoscopy 3-Colonoscopy 4-ERCP

The oesophago-gastro-duo contributes largest share in utilsation of endoscopy services.

Manpower Utilisation for Endoscopy Technician=Time taken to make patient entry+Time taken to prepare patient+time taken for doing endoscopy+time taken to make reports /Total paid time

=1min*56 +3min*56 + 537 +4min*56 /7200

=56+168+537+224 /7200

=985/7200 min

=13.68%

PULMONARY FUNCTION TEST

There is one PFT machine.

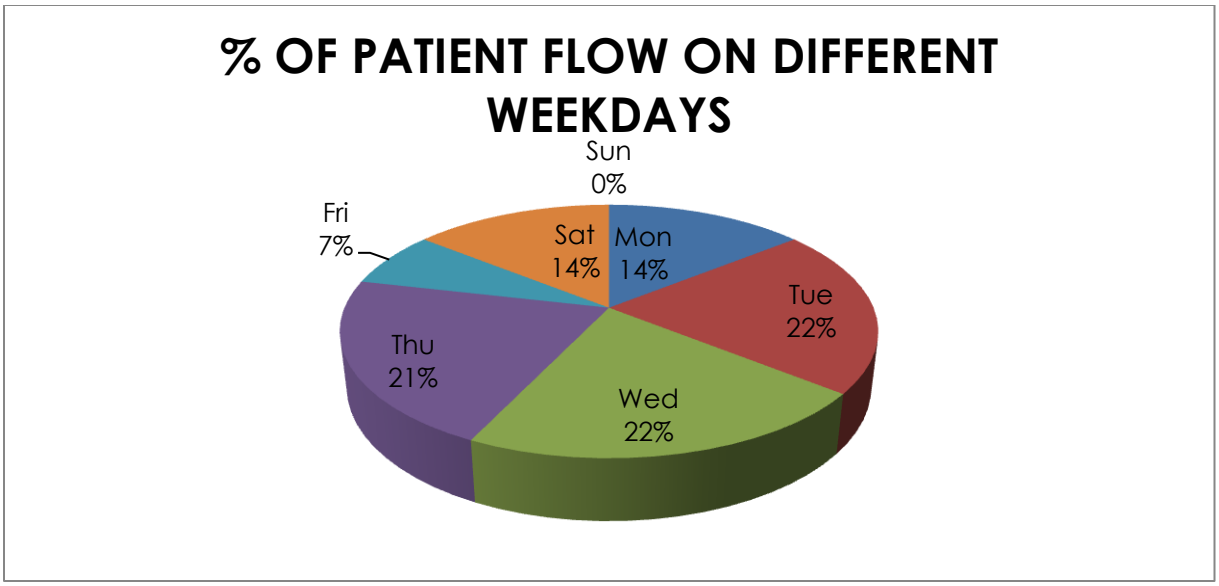
One technician

Average time it takesfor a procedure is 20 min.

There were 16 patients.

317 minutes were utilized.

The utilization of PFT machine is 4.4%.



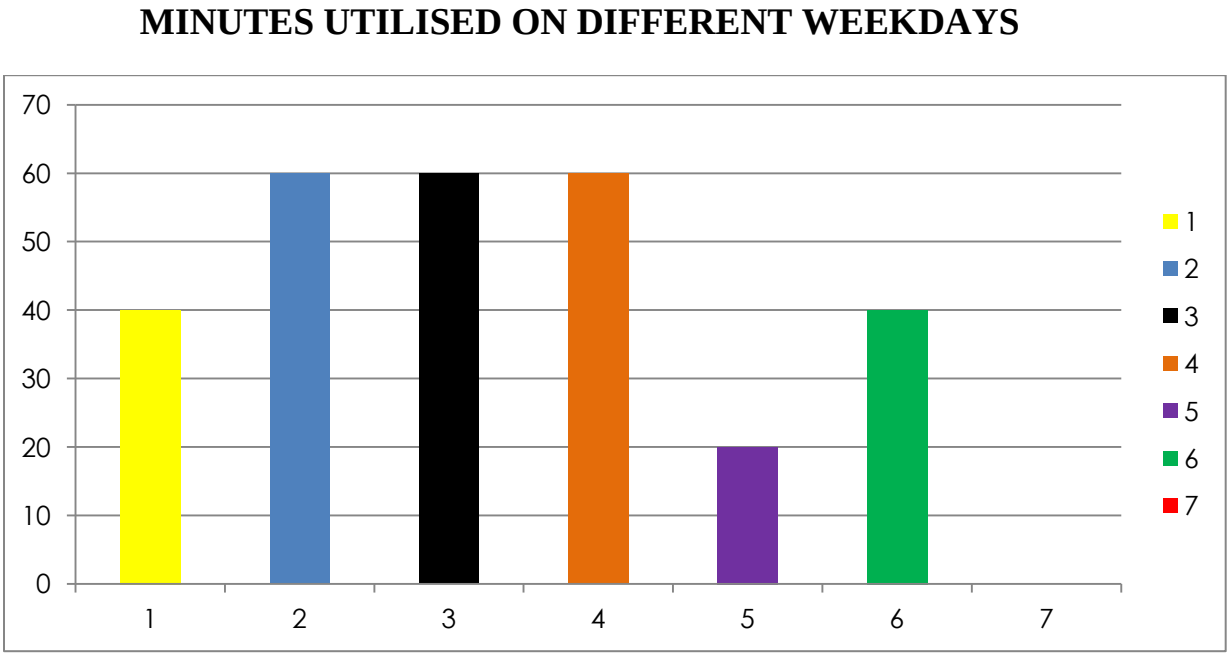


Fig 12. 1-Mon 2-Tues 3-Wed 4-Thu 5- Fri 6-Sat 7-Sun

BRONCHOSCOPY

There is one bronchoscopy equipment.

The technician for PFT carries out the procedure for bronchoscopy as well.

The time taken for procedure is 45 min.

There were 8 patients in 15 days.

316 minutes were utilized.

The utilization of bronchoscopy is 4.4%

NCV

The utilization of NCV is 3.33%

8 NCV were done in the time frame

240 minutes were utilized

The utilization of NCV is 3.33%

Manpower Utilsation is

Time taken to prepare patient+Time taken for NCV + Time taken to make reports

Time taken for preparing patients and time taken for reports takes on an average 15min for each patient

5% manpower utilization.

EEG

The utilization is 5%

6 EEG procedures were done in the time period.

The minutes utilized were 360

The utilization is 5%

Manpower Utilisation (Time taken to prepare patient+Time taken for EEG + Time taken to make reports)/Total available minutes

On an average 20 minutes utilsed per patient for pre-procedure preparation and making reports

=6.736%

Since the technician carrying out the NCV,EEG tests is same hence manpower utilsation is (5+6.736)%=11.736

IMPORTANT FINDINGS

1. The major utilization of the Non Invasive Cardiology diagnostic services were by the preventive health check up patients(75.45%).The share of inpatient utilization was 22.37% and other patients 2.18%
2. The utilization of TMT does not depend on the number of patients,but also depends on age,medical condition of patient etc determining time taken to reach the target heart rate by the patient.
3. The utilisation of Ultrasonography depends on the type of patient,his/her medical condition etc.
4. The waiting time for patients is very low for ECG.It ranges from 1-4 minutes merely.
5. The waiting time is high for patients since some of the cardiologists who carry out ECHO are also engaged in carrying out procedures like Angiography ,Angioplasty Ward rounds and consultations.
6. Although there were days assigned for a particular interventional cardiologist who would carry out all ECHO procedures on a particular day,some patients preferred particular cardiologist.For this they had to sign a consent form.
7. Patient has to wait for the reports since these have to be prepared by Echo technicians and then signed by respective cardiologists.
8. In some cases of TMT the male patients had to wait for a considerable time due to non availability of barber (who shaved the hair on patient's chest for placement of leads.
9. In cases of Paediatric Echo,there is a considerable delay because of non availability of nurse who has to administer medication to children before carrying out echo. Hence the waiting time depends on the availability of Nurse also.
10. The feedback of patients is not taken in the Non Invasive Cardiology,Endoscopy and NCV,EEG department.
11. The major share of utilization in Endoscopy department was by the Oesophago-Gastro Procedures(66%) followed by Colonoscopy (18%)
12. There are constant enquires by the patients waiting for their turns to get Ultrasonographies done and sometimes they enter into argumentative behaviour with the staff.

13. The major share of utilization in Ultrasonography department is of Whole Abdomen procedures(44%).

EXTERNAL ENVIRONMENTAL ANALYSIS

According to the Porter's Five Forces model entry,rivalry,substitiutes,buyers and Suppliers govern the intensity of competition in an industry.

EXISTING RIVALRY

The various diagnostic center in Jaipur,other private hospitals offering diagnostic services are part of the competition Narayana Hrudyalaya is facing.

POTENTIAL FOR SUBSTITUTES

Free diagnosis scheme has been launched throughout Rajasthan in a phased manner from April 7 on the eve of World Health day.Under the scheme patients can undergo 57 free diagnostic tests at government hospitals linked to medical colleges.Another 44 tests would be offered free of cost at district and satellite hospitals.The scheme's second phase will start from July 1,when 25 essential diagnostic tests would be available for free in government community health centres.In the third and final phase to be launched on Independence day,the scheme would cover all primary health centes and dispensaries where patients can undergo 15 basic diagnostic tests free of cost.

RECOMMENDATIONS TO INREASE UTILISATION OF DIAGNOSTIC SERVICES

Public awareness regarding the quality of diagnostic services provided by Narayana Hrudyalaya can be increased through pamphlets,newspaper articles,magazines ,hoardings.

Notifying the patients about the validated and efficient tests carried out by the trained staff.

Most importantly, use of Social Media to promote hospital establishes relevance to the community.

Creating Exciting promotions that get people talking about the services the hospital provides

Presenting and publicizing testimonials that simulate Word of Mouth.Advertising,brochures and websites if feature comments from satisfied customers can increase the positive word of mouth

Pay for the targeted placement of adds to keyword searches related to best diagnostic services on search engines

Designing more packages.Presently Narayana Multispeciality Hospital is laying stress on the Cardiac packages,however utilization can increase by designing more packages like wellness packages,executive packages,wellness packages etc.

Including the patients as a part of value creation process

IMPROVING THE PATIENT EXPERIENCE

The waiting time of patients is very high in the some diagnostic services like USG,ECHO.The waiting time can be reduced by:-

A.Scheduling the Inpatient ECHO,USG tests in the non-peak hours

B.Better Inter-departmental coordination can result in reduced waiting time.For ex:-when a cardiologist is available in ECHO room who has to carry out an ECHO of a patient admitted in CCU,immediately the patient should be called in and

delays due to non availability of housekeeping staff or wheel-chair to carry the patient to ECHO room should be overcome.

C.Prior appointment system for Preventive Health Check Ups i.e if a patient wants to get his ECHO done from a particular cardiologist,he can be given a time slot during which the cardiologist does not carry out a surgery,ward round or OPD consultation.

D.In paediatric ECHO cases the waiting time can be reduced if the Nurse who administers medicine to the paediatric patient is available on time and assigns her duty to other nurse when on leave.

E.Reduction in the waiting time for reports for diagnostic services.This can be reduced in Ultrasonography by having a staff dedicated to making only USG reports.As the waiting time is prolonged in USG sometimes because the staff has to go to CT and MRI diagnostic department for making reports.

F.It should be made easier for Patients to give feedback

F. Service recovery should be made effective

The patient complaints should be effectively handled

MORE LINKAGES WITH HOSPITALS HAVING NON-AVAILABILTY OF DIAGNOSTIC TESTS

CROSS TRAINING OF EMPLOYEES

Since the manpower utilization is low,the employees can be cross trained to perform a variety of tasks,they can be shifted to bottleneck points during their idle hours

CONCLUSION

Utilisation reflects the extent to which the potential access of a healthcare service is converted into realized access.

The employees are an important contributing factor to the organization and also one of the most expensive contributing factors. Not only does a company pay wages to its employees, but it typically invests in employees by paying for their training and benefits, such as health and life insurance and retirement accounts. Thus, for a company to maximize its chances of success, it needs not only to understand its manpower utilization but also to work toward achieving optimal use of its workforce.

Utilization reviews can be used to increase the efficiency of diagnostic services.

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