

Equipment Utilization across the Group of Wockhardt Hospitals

**Internship Training
at
Wockhardt Hospitals Limited, Mumbai**

**By
Mani Pathak**

**Under the guidance of
Dr. Arindam Das**

**Post Graduate Diploma in Hospital & Health Management
2012–14**

 **IIHMR UNIVERSITY**
Institute of Health Management Research
Jaipur
2014

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that Dr Mani Pathak, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management Research, Jaipur has undergone internship training at Wockhardt Hospitals Limited from 27th January 2014, to 16th May 2014

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.



Dr. Ashok Kuashik
Dean, Academics and Student Affairs
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Dr. Arindam Das
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May 16, 2014

TO WHOMSOEVER IT MAY CONCERN

Dr. Mani Pathak has successfully completed her Dissertation project with Wockhardt Hospitals Limited through IHMR.

Her internship lasted for a period of Fifteen weeks, starting from 27th January 2014 to 16th May 2014.

The following project was undertaken by her: -

<u>Topic</u>	<u>Name of the Guide</u>
1. Equipment Utilisation across the group hospitals.	Ms. Maitree Bhattacharya

Her performance and discipline during the term of the project has been good.

We wish her all the very best in her future endeavors.

Yours sincerely,
For Wockhardt Hospitals Ltd.

Amiya Kumar Sahoo
Dy. General Manager – Human Resources

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Equipment utilization across the group of wockhardt Hospitals** and submitted by **Dr Mani Pathak** Enrollment No. **17-1333** under the supervision of **Professor Arindam Das** for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from **27th January 2014** to **16th May 2014** 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.

*Mani
Pathak*

Signature

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Signature

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List of Abbreviations –

CT – COMPUTED TOMOGRAPHY SCAN

USG – ULTRASOUND MACHINE

MRI –MAGNETIC RESONANCE IMAGING

ECG- ELECTROCARDIOGRAPH

TMT – TREAD MILL TEST

PFT – PULMONARY FUNCTION TEST

OT - OPERATION THEATRE

CSSD – CENTRAL STERILE SUPPLY DEPARTMENT

ICCU – INTENSIVE CORONARY CARE UNIT

ICU - INTENSIVE CARE UNIT

**Dissertation on “Equipment Utilization Across the Group of
Wockhardt Hospitals**

2.0 EXECUTIVE SUMMARY

Hospital medical equipment and supplies refer to various devices, tools, instruments and medical equipments that are used in hospitals and healthcare establishments. Utilization essentially means the use of the equipment to its full potential. It should be the endeavor of the management to optimize the equipment utilization to obtain maximum return for the capital invested. Proper utilization of the hospital equipment will lead to:

- Optimal patient handling and rapid turnover.
 - Minimum possible cost on maintenance of equipments.
 - Quality patient care and satisfaction.
 - A satisfactory mechanism to assist the process of condemnation.
 - The equipment audit reports provide an objective method for procurement of equipment in future.
 - To identify inadequacies and recommended measure.
 - Cost per reportable result and cost effectiveness can be evaluated
-
- This prospective study was carried out at various locations of Wockhardt Hospital , in different departments and ten service areas, in order to find out the availability and their utilization of various major equipment in the respective areas. The study was primarily based on a pre-determined check list of the required standard equipment in the hospital

2.1 Introduction

Hospital medical equipment and supplies refer to various devices, tools, instruments and medical equipments that are used in hospitals and healthcare establishments. Utilization essentially means the use of the equipment to its full potential. It should be the endeavor of the management to optimize the equipment utilization to obtain maximum return for the capital invested. Proper utilization of the hospital equipment will lead to:

2.1.1 AIM-

- This project is intended to assess the capex versus cost of maintenance of all the equipments .

2.1.2 Objectives

- To see the possibility of redistribution of equipments based on their utilization.
- To study the usage of each equipment and identifying the optimum numbers.

2.1.3 Problem statement

This study basically highlights the key equipments across the group of hospitals which need to be focused, which are surplus in number and their utilization is not optimum thereby, leading to an increased cost of maintenance of these equipments. An assessment of all the equipments at all the hospitals of Wockhardt group is necessary before making any attempt for relocation and condemnation of the equipments. The essential steps must be taken into account. The necessity of managing the equipment is an important area of concern and all pervasive factor in the present day hospital has become a necessity in almost all its activities whether diagnostic, therapeutic and supportive in nature. Further, due to rapid technological progress, particularly during the last few decades, the equipment has become not only more and more complex but also require regular specialized maintenance and repair, which is very expensive

2.2 REVIEW OF LITERATURE

There are recommendations of various technical committees of Government of India (namely Aiyar committee in 1963¹, Jain Committee in 1968², and Bajaj committee in 1980)³, study of Anand and Agarwal from NIHFV in 1992⁴, and the recommendations of the Bureau of Indian Standard (BIS) in 1988⁵, 1989⁶, Rao Committee, Ministry of Health & Family Wealth⁷. Government of India and WHO for some departments as such no specific norms exist in our country on the required essential equipments in a hospital.

2.3 METHODOLOGY:

2.3 (a) TYPE OF STUDY: The study was based on the check list of equipment required for different departments/service facilities of the various hospital, of Wockhardt group.

The methodology for this equipment utilization study included-

- **Study Design** – Retrospective analysis
 - **Duration Of study** - 1 yr –(March13 - Feb14)
1. Determination of the current availability of the equipments in respective departments /service facilities across the various hospitals of wockhardt .
 2. Equipments categorisation into two broad categories i.e. movable and non-movable
 3. Determination of the current availability of the equipments in respective departments /service facilities across the various hospitals of wockhardt.
 4. Equipments categorisation into three broad categories i.e. Diagnostic, Therapeutic and Surgical.
 5. Actual observations of the various service delivery sites/departments. Ten cases were observed for various diagnostic procedures including X-Ray, MRI, CT, USG , ECG,ECHO,PFT and their average timings each procedure takes for which a machine is being utilized was considered
 6. Studying the operational hours of working of each department.
 7. Studying the standard time TAT for an investigation, tests and different diagnostic, therapeutic and surgical procedures.

2.3 (b) Data Collection Techniques -

- **Source of information was based on both the primary and secondary data –**
- **Primary data** included the
 - calculation of TAT (turn-around time) for various Imaging modalities , non-invasive diagnostics , **critical** care equipments (ventilators)
 - **Interview** of the hospital administrator, Bio medical Incharge , Specialists and the officer in charge dealing with various equipment at different department/service facilities as also the concerned technicians who handle the equipment .
- **Secondary data –**
 - 1) was collected from the HIS –software of the hospital regarding the equipment specific volume of cases for -
 - **Diagnostic equipments** -Radiology equipments (X-Ray ,CT ,USG ,MRI,) and Cardiology equipments (ECG,ECHO,TMT,PFT ,HOLTER)
 - **Therapeutic procedure equipments** – Endoscopy equipments (Gastroscope, colonoscope , bronchoscope) ,dialysis machine and Cath-lab.
 - **Surgical procedure equipments** – involve Operation theatre equipments such as OT Table ,O.T.Light ,Pendent , Anaesthesia machine , Surgery specific equipments such as C-arm, CUSA-Machine ,General and laproscopic equipments , cardiac equipments ,orthopaedic equipments.
 - **Cath lab equipments**
 - 2) Studying the records maintained for the last **12months** considering the volume of cases – such as in Endoscopy, Dialysis unit , Laboratory , Operation Theatre , Aesthetic OPD
 - 3) Department specific registers for the **portable X-ray machines and ECG –** Machines at various nursing station and wards.

2.3.(c) Sample size: -1600 Equipments

- 4) GOA - 300
- 5) RAJKOT: 596
- 6) SURAT: 220
- 7) VASHI - 143
- 8) NASIK- 342
- 9) Sampling method was stratified sampling.
- 10) These samples for 1600 equipments were collected over a period of 1 year from March 01 2013 to February 28, 2014. Data was collected in the time tracking sheet (made on the basis of process flow). Time tracking format is attached in the Annex a and B.

2.3 (c) Challenges / Problems faced –

Since this was a study that included data collection from all the departments of all the units of Wockhardt Hospitals. So, collecting the entire data in a fixed interval of time was a real challenge. Also, data was needed for ventilators, various Portable ECG- Machines mostly in the department of Casualty, ICU, Wards, Operation Theatre, PORTABLE x-Ray machines was quite difficult since, data was not directly available and had to be derived from the billing since, it was not being maintained by the aforementioned departments.

2.4 Statistical Treatment

Data collected was cross checked for any incomplete or partial filling. Using Microsoft –Excel 2007 collected data was then be edited, coded, tabulated, organized into various frequency distributions.

2.5 RESULTS –

2.5.1 (a) RADIOLOGY –

Table- 2.1 TAT of Imaging modalities

MODALITY	TYPE	DURATION
X-ray	PLAIN	6 mins
X-Ray	CONTRAST	56 mins
CT	PLAIN	15 mins
CT	CONTRAST	30 mins
USG	ABDOMEN & PELVIS	15 mins
USG	CAROTID DOPPLER	20 mins
USG	ARTERIAL/VENOUS - Bilateral	60 mins

(a) X-RAY MACHINE

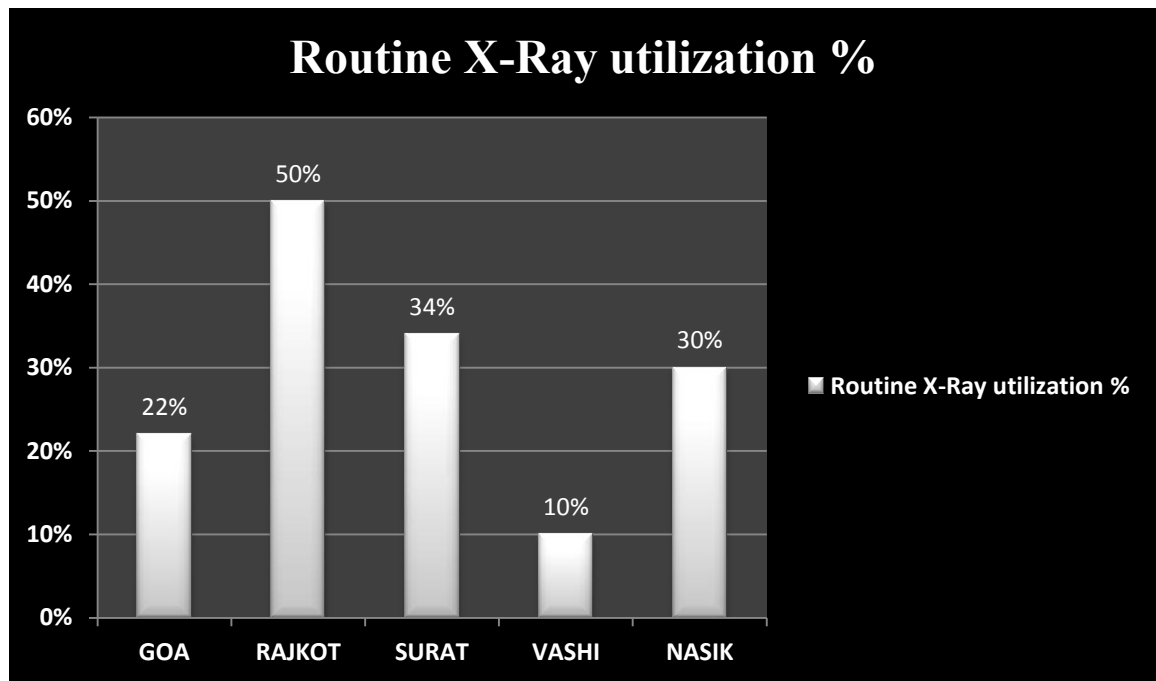


Figure -2.1

Figure -2.1 is showing the utilization rate of X-ray machine during the Routine timings between 8am- 8pm when there is peak load.

Points of consideration-

- Equipment specific volume of cases.
- Functional hours of department.
 - Goa-9 hrs
 - Rajkot -12
 - Surat – 12hrs
 - Vashi-12hrs
 - Nasik – 12

OBSERVATIONS-

- At all the locations in the radiology department just on time ie Time-in was recorded (when was the patient taken inside) and not the time –out.
For calculating the TAT (MIS)this format was being followed which doesn't include the time-out of patient i.e. procedure end time simply includes the time from entry to exit(time when his reports are being despatched) .

(b) EMERGENCY X-Ray Utilization

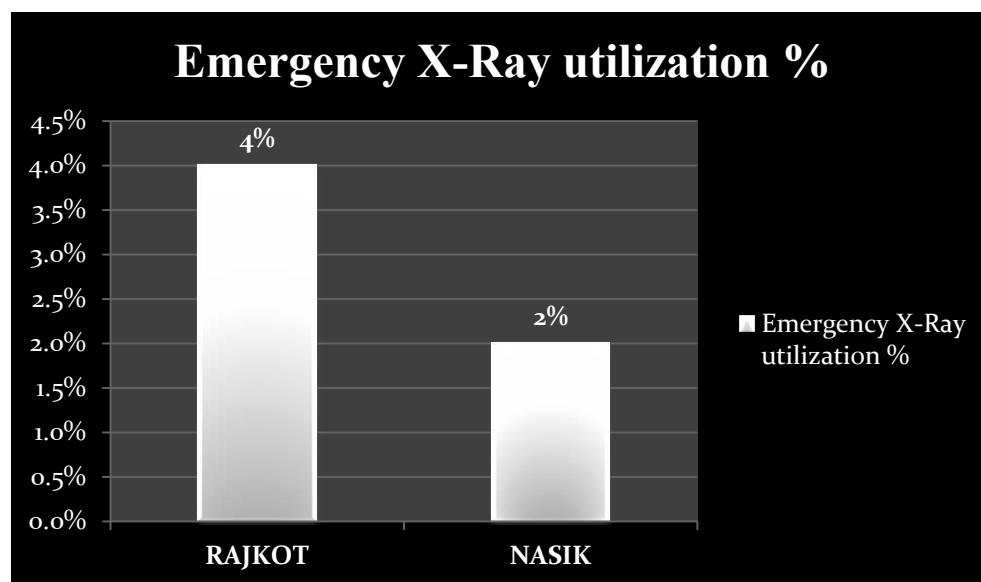


Figure -2.2

During the emergency hours only Rajkot and Nasik are considered because, at Surat , vashi and Goa cases happening during night hours were negligible.

(c) CT-SCAN

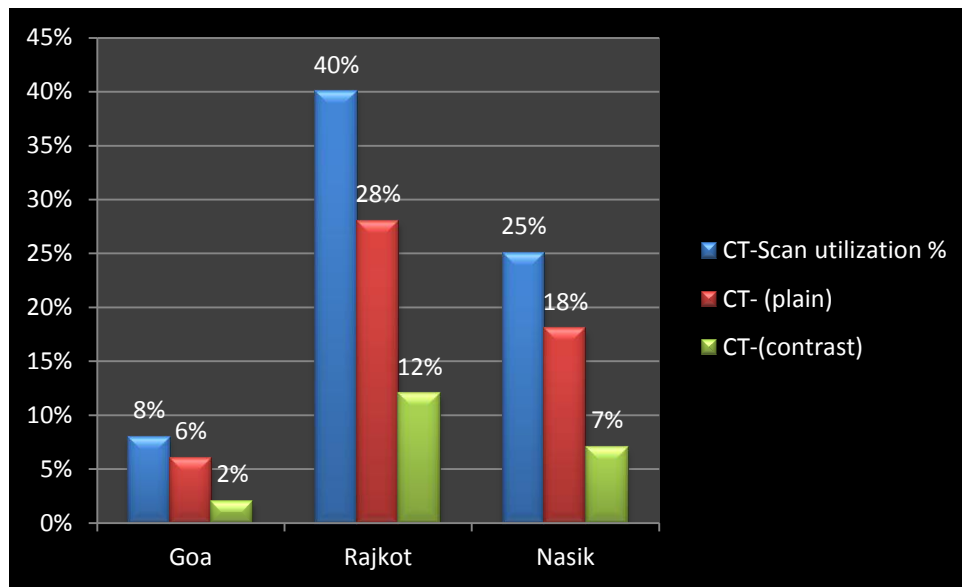


Figure 2.3

- Figure 2.3 represents that almost two-fifth of the cases are taking place at Rajkot as compared to Goa and Nasik that shows, that neuro patient volume of cases is quite high in Rajkot as compared to other locations.
- Points of consideration-
- Specific volume of cases for CT-plain and contrast.
- Operational hours-
 - Goa – 9hrs
 - Rajkot-12hrs
 - Nasik-12hrs
- Ct-utilization is highest in Rajkot as, the no. of neuro cases coming there is quite high .
- Also, the critical-case mix focus is higher at Rajkot and Nasik as compared to Goa.

(d) USG-MACHINE

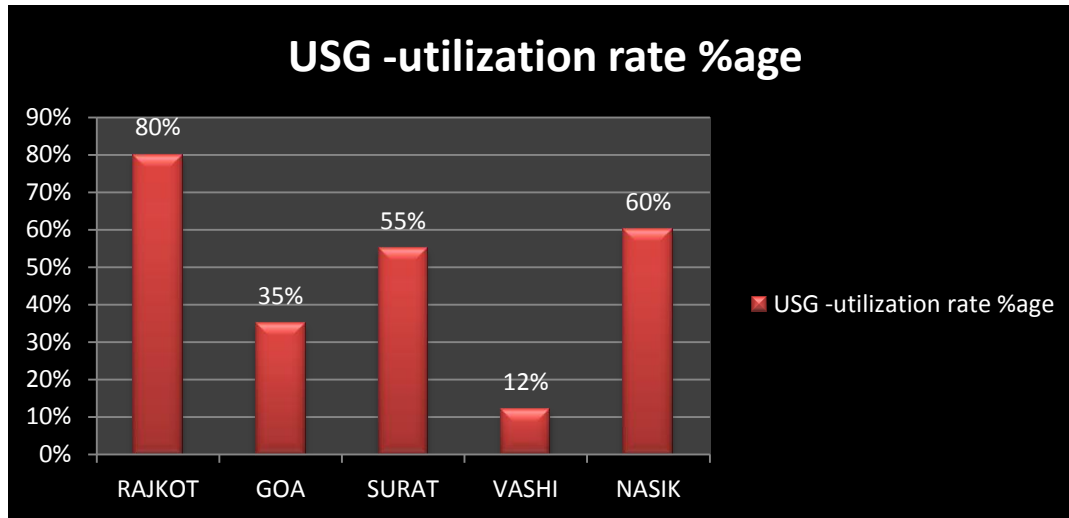


Figure -2.4

Figure 2.4 shows the utilization percentage of Ultrasound machine across the locations, wherein its maximum for Rajkot.

- Functional hours of department at all the locations is considered , as per the availability of the sonologist in the department.
 - Goa- 6hrs (9:30-3:30)
 - Rajkot -11hrs (9:00-8:00)
 - Surat – 7.5hrs (10:00-3:00 and 5:30-8:00)
 - Vashi -8hrs (9:30-4:30)
 - Nasik-11 hrs (9:30-8:30)

(e) MRI-MACHINE

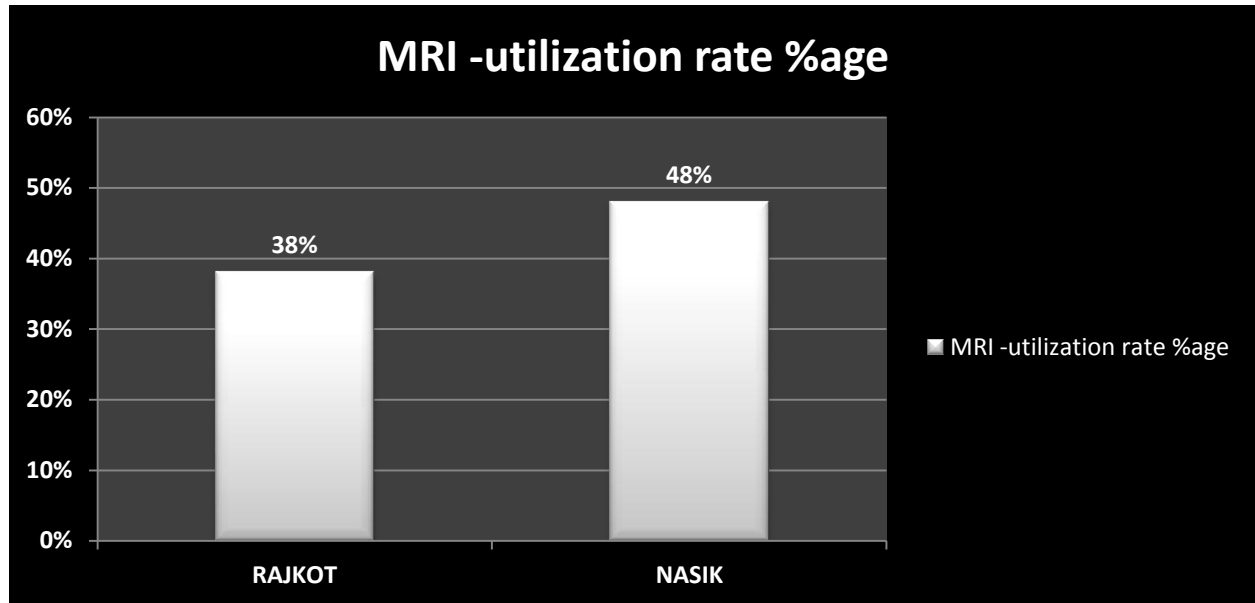


Figure -2.5

Figure 2.5 is representing the utilization percentage of MRI Machine, which is only available at two locations of wockhardt group i.e Rajkot and Nasik.

- Points of consideration-
- Equipment specific Average volume of cases in a month of various MRI-studies –
 - MRI-Angio /Brain/ Venogram/ spine-plain
 - MRI –Contrast
- Standard time taken for each study
- Average no. of cases per month
 - Rajkot- 222cases
 - Nasik- 269 cases

2.5.2. (B)NON-INVASIVE DIAGNOSTICS

Table no - 2.2 Duration of Non-invasive diagnostic tests

TEST	DURATION
ECG	10mins
ECHO	20mins
PFT	15mins
TMT	30mins
EEG/ EMG	40mins

(a) ECG-MACHINE

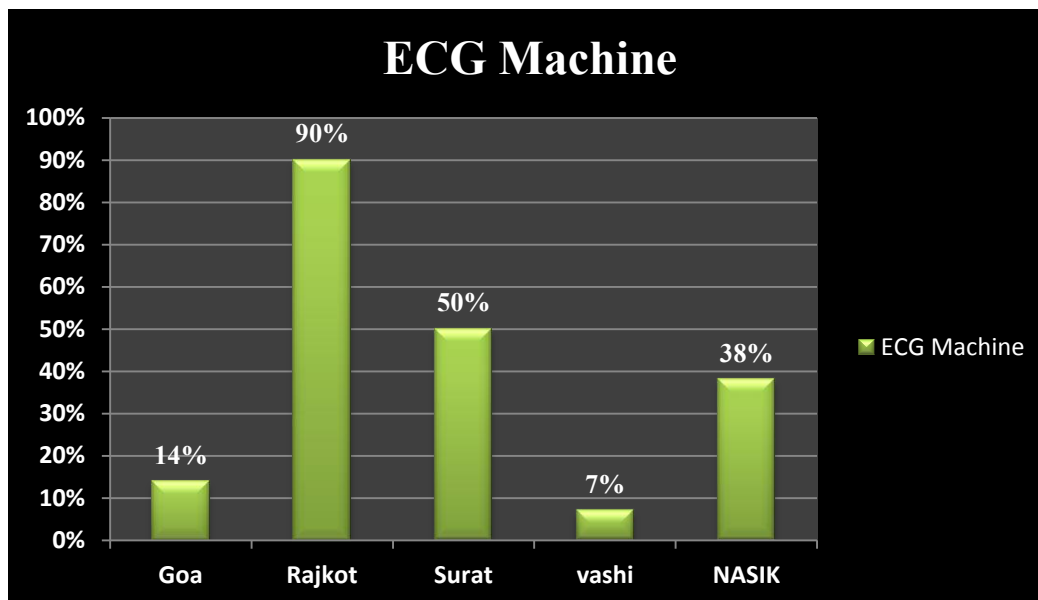


Figure-2.6

Figure 2.6 represents the usage of ECG-Machine kept in cardiology department which is maximum getting utilized at Rajkot folloed by surat. Surat has high utilozatiion since,it's a pur cardiac specialaity hospital followed by

- Functional hours of department
 - Goa and Vashi has – 9hrs,
 - Rest, all functional for -12hrs
- Vashi has least utilization rate because, of less no. of patients.
- Monthly volume of cases –
 - Goa- 202 cases
 - Rajkot -1442 cases
 - Surat – 819 cases
 - Vashi -74 cases

- Nasik- 597 cases

(b)ECHO-MACHINE

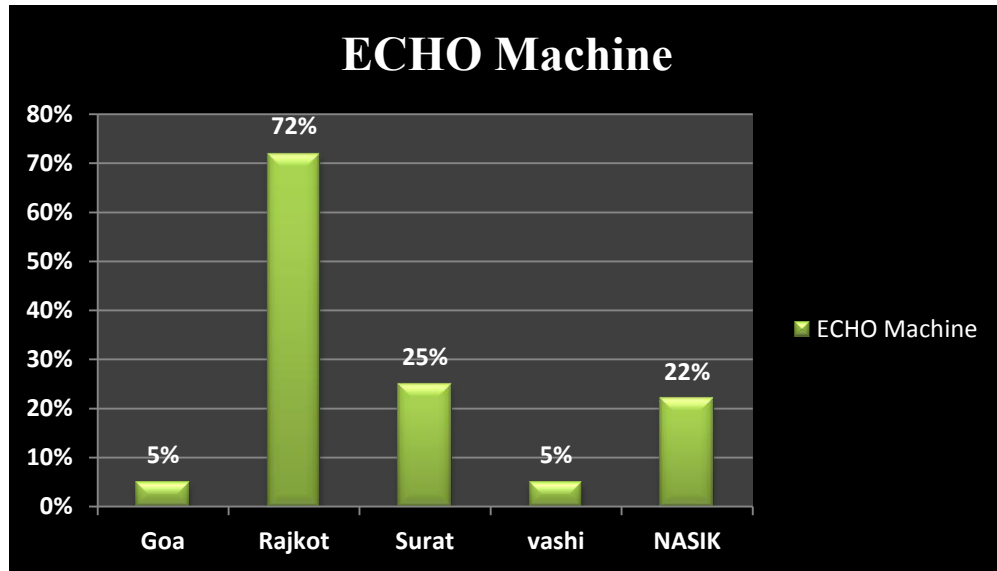


Figure -2.7 is representing the Utilization rate of ECHO Machine at various locations where the average monthly volume of cases are taken into consideration.

- Average Monthly Volume of cases.
 - Goa – 90 cases
 - Rajkot-440 cases
 - Surat- 252 cases
 - Vashi- 32 cases
 - Nasik- 372 cases

(c) TREAD MILL TEST (STRESS TEST)

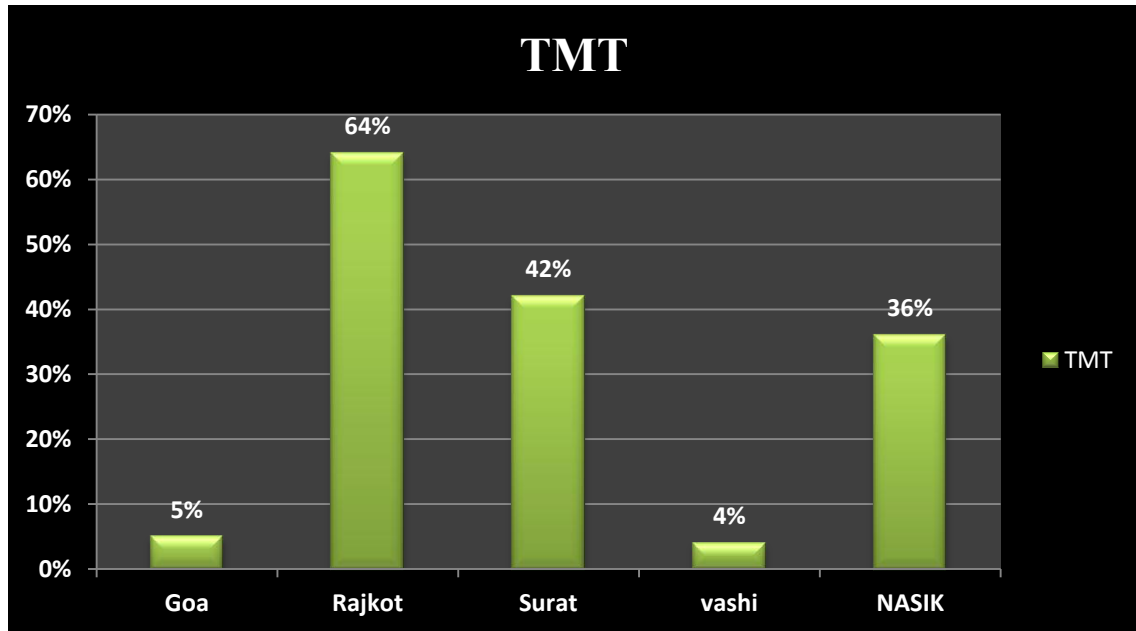


Figure-2.8

Figure 2.8 represents the utilization rate of tread mill which is a 30min test on average and monthly volume of cases are considered.

- monthly Volume of cases
 - Goa- 38
 - Rajkot- 351
 - Surat - 375
 - Vashi -25
 - Nasik -263

2.5.3 ENDOSCOPY

PROCEDURE	DURATION
GASTROSCOPY	16 mins
COLONOSCOPY	20mins
BRONCHOSCOPY	10mins

Table- 2.3 Endoscopy procedures duration

(a) GASTROSCOPE

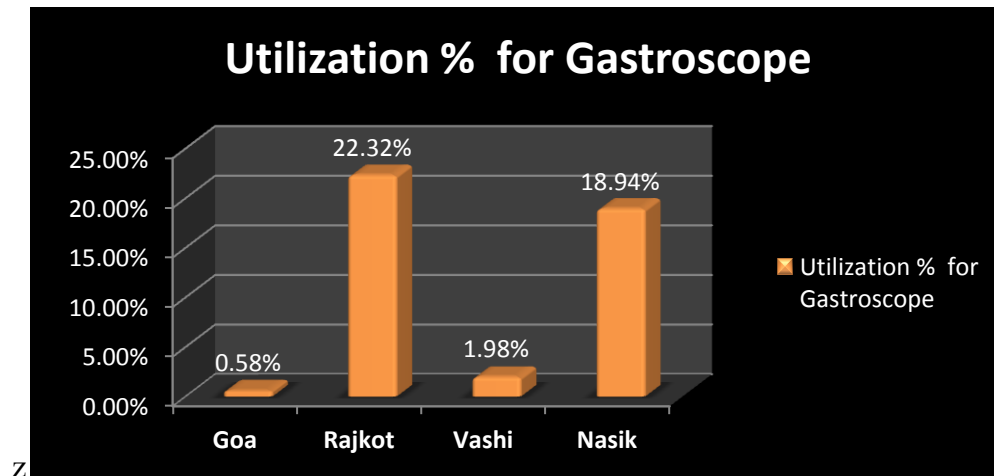


Figure -2.9

- Average monthly volume of cases of Gastroscopy

- Goa – 5 cases
- Rajkot -188 cases
- Vashi – 7cases
- Nasik – 115 cases

- Functional hours of department –

- Goa-9hrs (9:30-6:30)
- Rajkot -9hrs (9:30-6:30)
- Vashi- 4hrs (9-10:30 ,3-5:30)
- Nasik- 6.5hrs (9-3:30)

(B) COLONOSCOPE

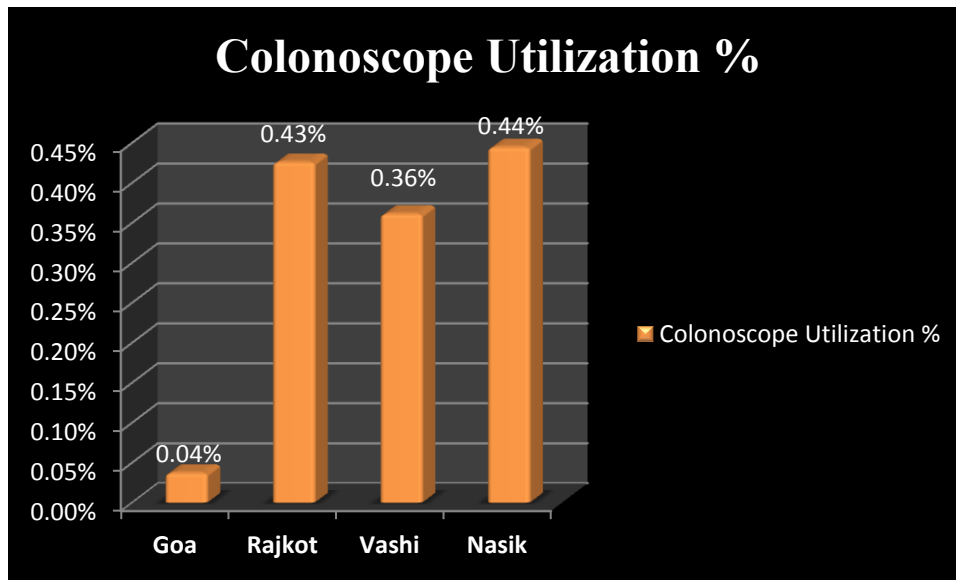


Figure- 2.10

Figure 2.10 represents that use of colonoscope is not even 1% at any of the locations of wockhardt hospital

- Average monthly volume of cases of Colonoscopy and Flex sigmoidoscopy together are considered for Rajkot and Nasik
 - Goa- 1 case
 - Rajkot –5 cases
 - Vashi- 5cases
 - Nasik- 39 cases
- Vashi- utilization rate is almost comparable to what Rajkot and Nasik has because of only 4 hrs as functional hours of department

(C) BRONCHOSCOPE

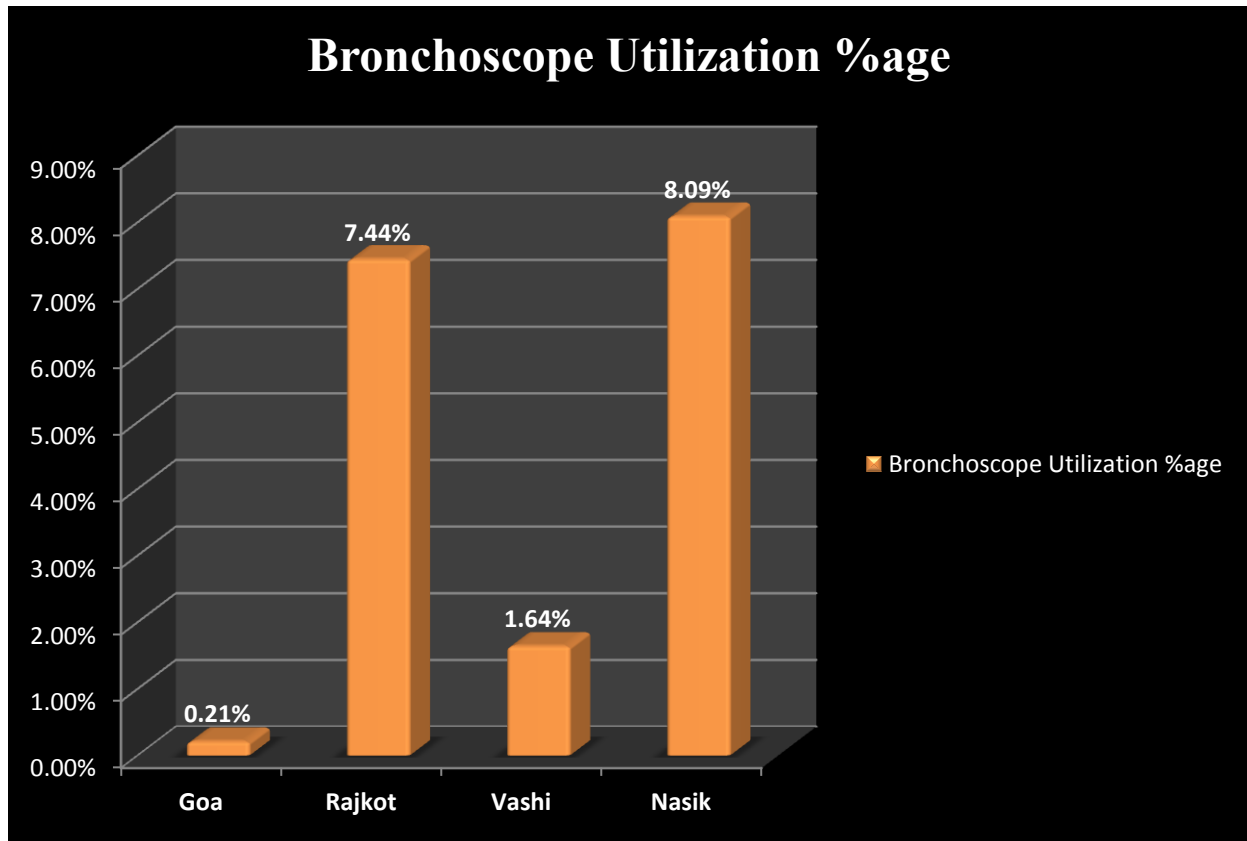


Figure-2.11

- From the graph 2.11 it can be clearly observed that almost 8% utilization of bronchoscope is there ,which again is quite low.
- Average monthly volume of cases
 - Goa- 1
 - Rajkot -6
 - Vashi – 2
 - Nasik- 4

2.5.4 (D) OTHERS

PROCEDURE	DURATION
DIALYSIS	4 hrs
CATH LAB (DIAGNOSTIC)	30 mins
CATH LAB (THERAPEUTIC)	60 mins

Table- 2.4 test name and duration of each tests

(A) DIALYSIS MACHINE

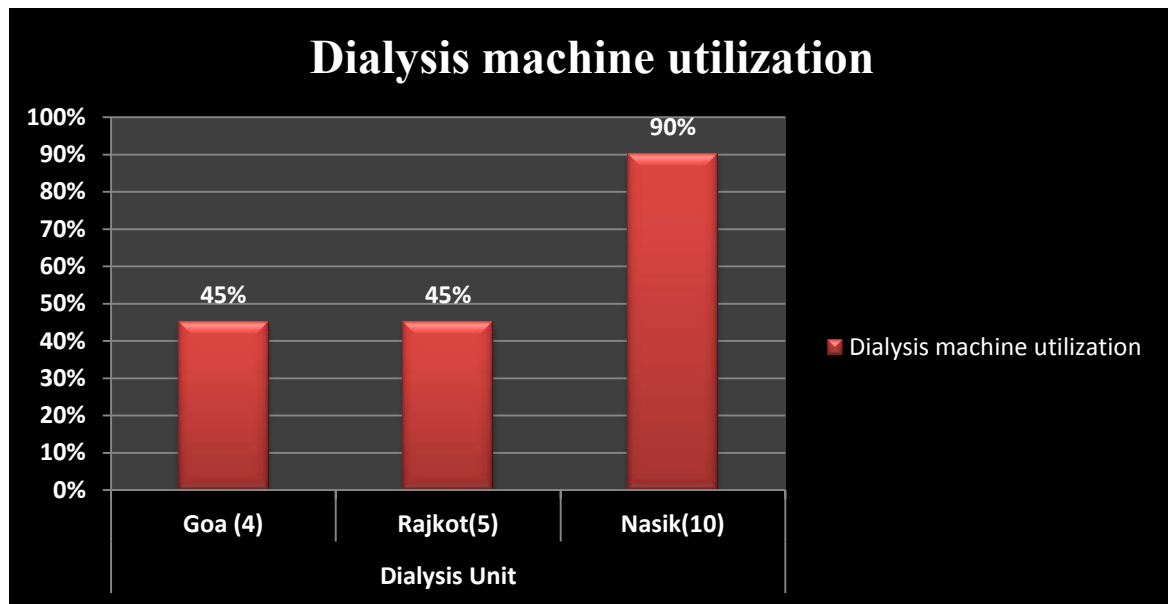


Figure-2.12

Figure 2.12 is showing the no.of dialysis machine each unit has along with their utilization percentage, which is maximum at Nasik

- No. of dialysis machines each unit has-
- No. of slots available –

LOCATION	No. of machines	Slots available
Goa	4	3
Rajkot	5	3
Nasik	10	7

Table no.- 2.5 Machines and slots availability in dialysis unit

- Surat and vashi – don't have a dedicated Dialysis units they have just one Dialysis machine kept in ICU.
- As such , no slot booking is there as per patient's requirement they prioritize and carry on the procedure.
- Nasik – has 10 machines ,distributed in two Dialysis units –
- Dialysis unit- 1 has 6 machines ,
- Dialysis-unit 2 has 4 machines .
- **Cases were scheduled based – on SLOT SYSTEM.**
 - Goa- ideally, there are three slots-
 - (8-12, 12-4 and 4-8) but, they are following only two slots because,of the less work load.
 - Rajkot- slot timings –
 - 8-12 , 12-4 and 4-8 PM
 - Nasik has two dialysis units with different slots-
 - Dialysis unit- 1 -→ has 4 –slots ie
 - 7-11 , 12-4 , 4-8 and 9-12 am
 - Dialysis unit- 2 has--→ 3- slots
 - 8-12 , 12-4 and 4-8 Pm

(a) CRITICAL CARE DIALYSIS UNIT MACHINE

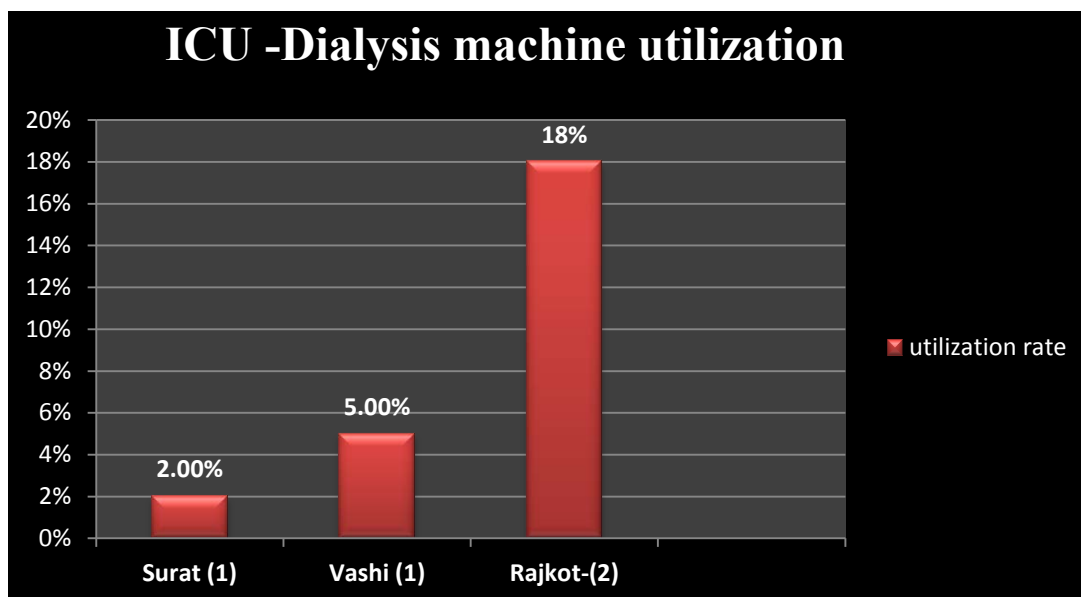


Figure-2.13

Figure 2.13 is showing the dialysis machine utilization in ICU for Surat and Vashi which don't have a dedicated dialysis unit.

- They have dialysis machine kept in the ICUs.
- Rajkot has a separate dialysis unit apart from that 2-machines are there in ICU.
- **Observations-** it was found that separate record for the positive cases is not being mentioned because, the units have got a dedicated machine for the positive cases (Goa, Rajkot).
- Dialysis done in ICU was either recorded in patients Yellow card in MRD File or directly in dialysis unit register
- At nasik, they have a record for the positive cases.
- By graph, u can mention that as in goa utilization is pretty low

- Recommendation- At Rajkot we have Infrastructure, so there is scope of catering to more no.of patients and so, should focus on increasing the volume of cases.
- At Goa also , it was being observed that they were catering only to old patients , though we have infrastructure availability ,so focus should be shifted on increasing the volume of cases.
- Separately keep a record for positive cases.
- ICU's dialysis record should be maintained in the ICU itself apart from, maintaining the record in dialysis unit master register.

(b) CATH LAB

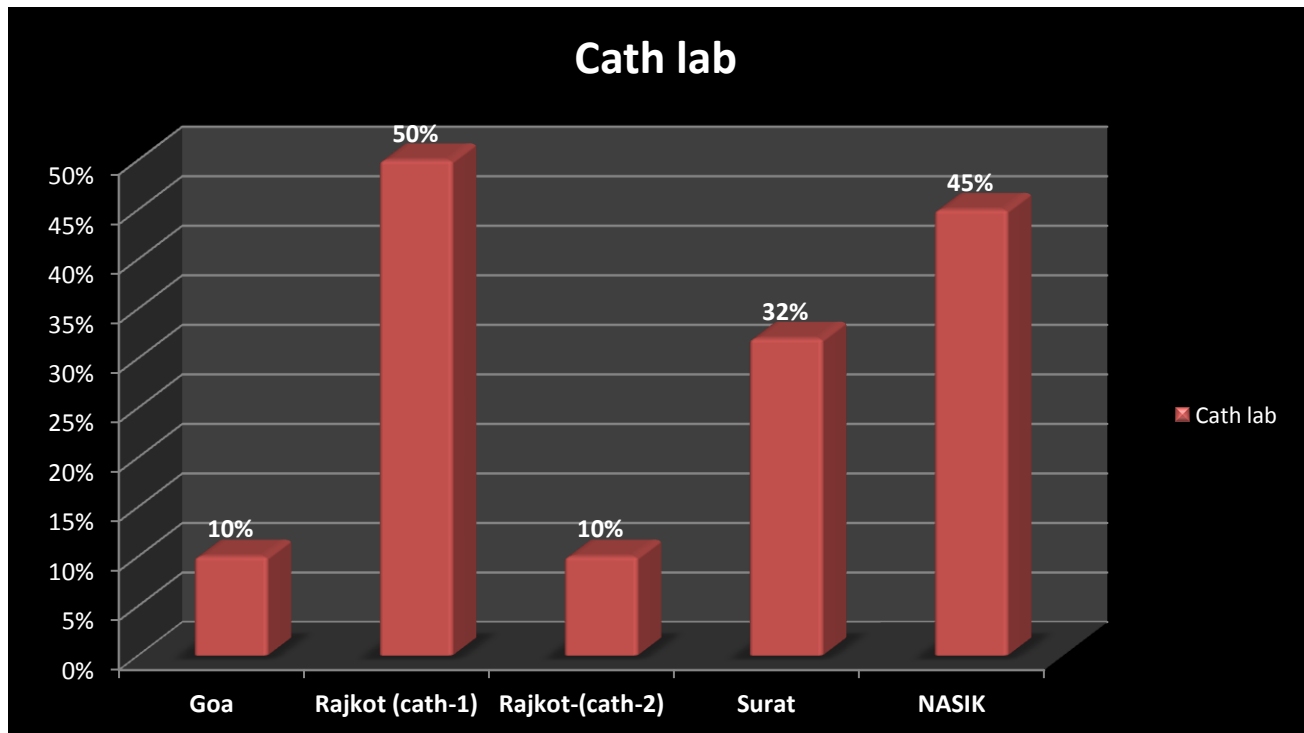


Figure -2.14

Figure 2.14 representing the cath lab utilization where both the diagnostic and therapeutic procedures are carried out.

- Rajkot has got two Cath labs .cath lab-2 got recently functional in Nov-13.
Various procedures don there are –
 - Coronary angiography
 - Cerebral angiography
 - Coronary angioplasty
 - Pacemaker implantation
- Functional hours considered- 24hrs.
- Average monthly volume of diagnostic and therapeutic cases are taken into consideration.
- Except, Goa every where department is functional for 12hrs.
- Rajkot – has two cath lab-
 - cath-2 data functional since nov-13

2.5.5 (E) INPATIENT EQUIPMENTS

- Categorized as –
 - Critical
 - Non-critical equipments
- Critical includes –ventilators.
- Non-critical equipments – patient monitors and syringe pumps.

(A) VENTILATORS

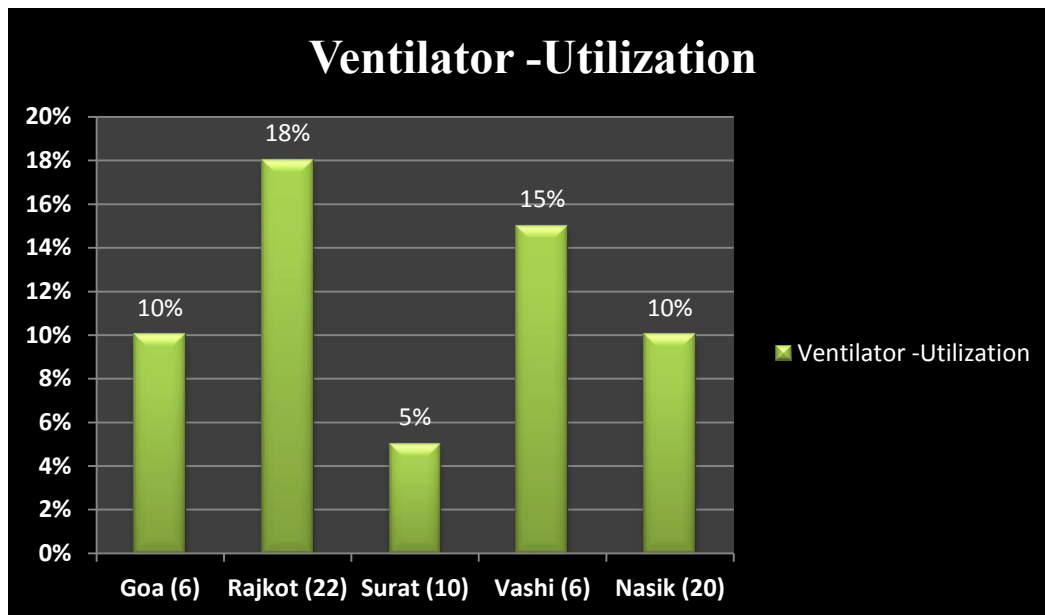


Figure -2.15

Figure 2.15 is showing the no.of ventilators each unit has the utilization rate of ventilators hours in critical care units at various locations,which is as such very minimally utilized at almost all the locations

location	Ventilators hours per day
Goa	12
Rajkot	82
Surat	7
Vashi	16
Nasik	34

Table-2.6 location –wise use of ventilators per day

- Both bipap and Cpap Ventilators considered together.
- No. of ventilators at each location.

(B) PATIENT MONITORS

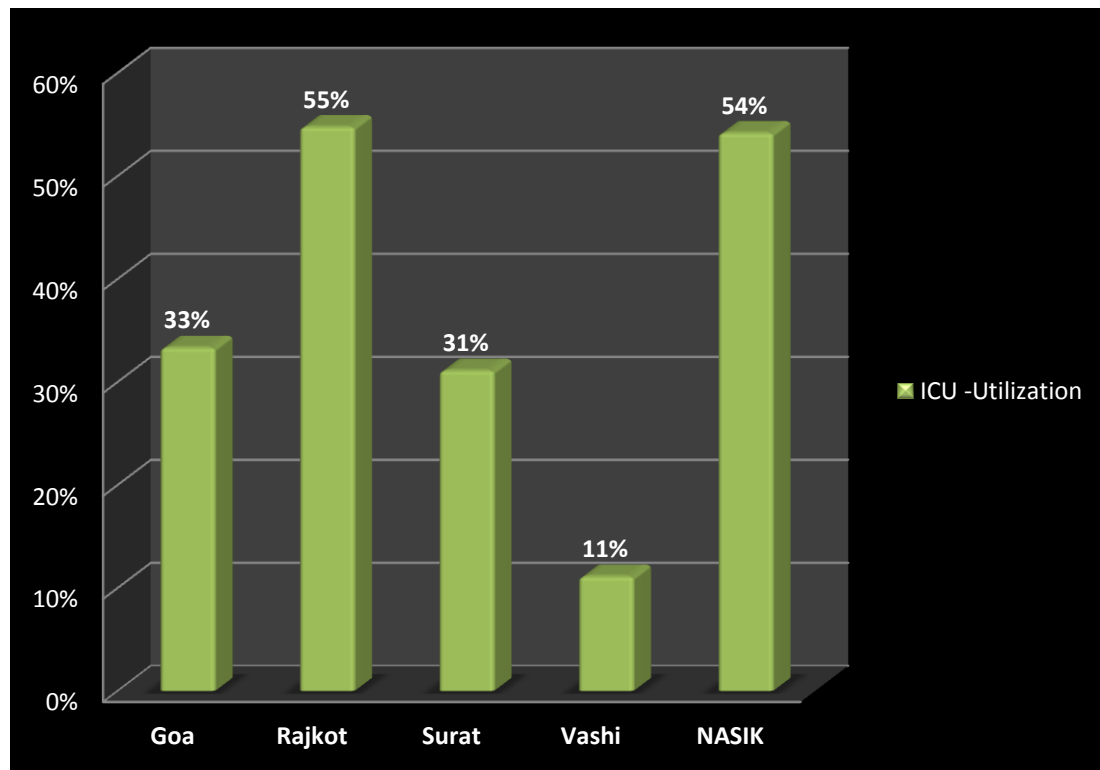


Figure-2.16

- Points of consideration –
- Bed strength of the ICU
- No. of patient monitors.
- Average occupancy of the ICU.
- Patient monitors are the fixed equipments , in which if patient is there are directly connected thereby, connecting all the fixed equipment with the ICU –Occupancy.
- Utilization rate – occupancy of ICU / Total no. of patient monitors.

2.5.6 (F) OT-UTILIZATION

- Operation Theatre-utilization is considered because ,there are certain common equipments which are being used along with the use of OT.
- List of Equipments –
 - O.T. Table
 - O.T.Light
 - Pendent (anesthesia)
 - Pendent (surgeon)
 - Anesthesia machine

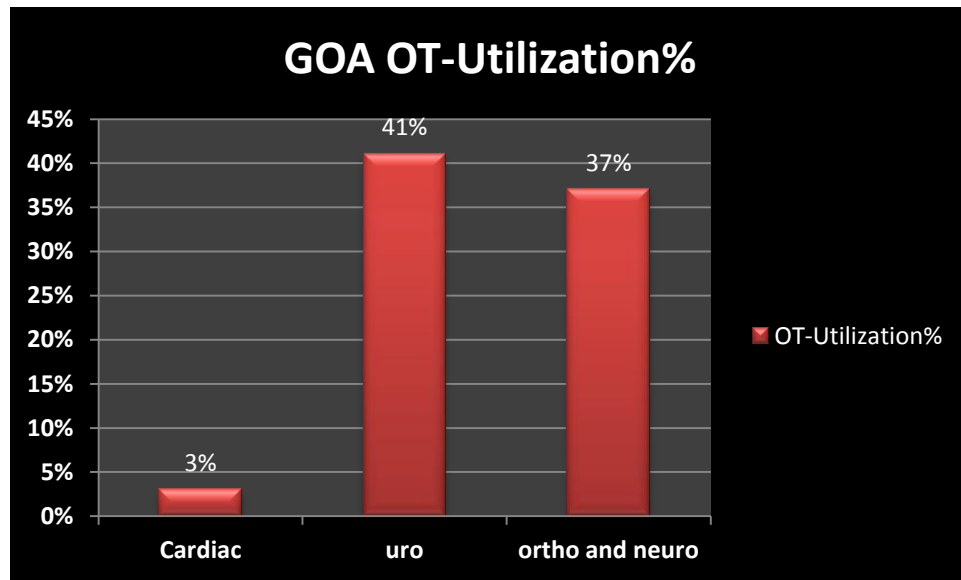


Figure -2.17

Figure 2.17 shows the OT-Utilization percentage of al the operation theatres in GOA.

- Goa has 5 OTs but, only three are functional
- OT-1 – cardiac
- OT-2- urology
- OT-3 –Ortho and neuro cases.
- Operational hours- 12hrs
- Including the cleaning time as well of 30 mins.

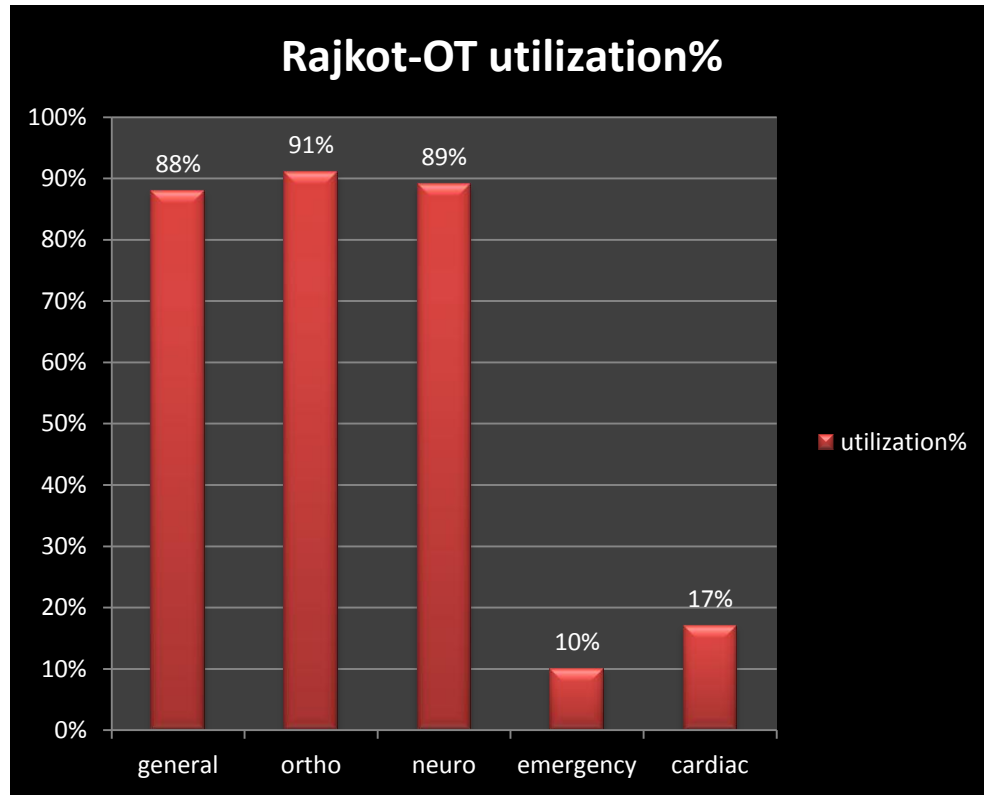


Figure-2.18

Figure 2.18 is the graph for Rajkot- operation theatres where maximum utilization is for ortho cases followed by neuro and general OT.

- Points of consideration –
- All OTs functional for 12hours
- OT-1 –general OT
- OT-2-ortho OT
- OT-3 Neuro -OT
- OT-4 Emergency OT (i.e. operational for 24hrs and 30 days)
- OT-5 Cardiac OT

SURAT and VASHI- OPERTAION THEATRE

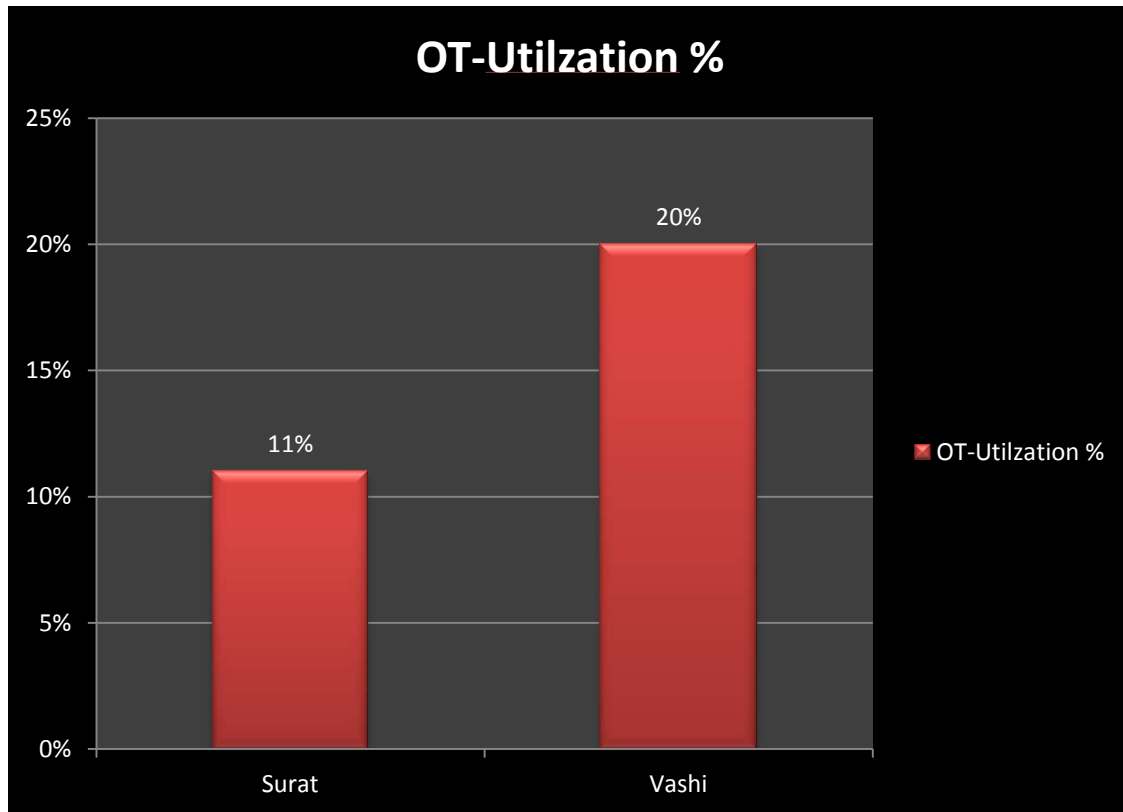


Figure-2.19

Figure 2.19 is a combined graph for Surat and vashi Operation Theatre since, both have just one OT.

- Surat and Vashi have single OT.
- Surat has got two OTs
 - OT-1 –Cardiac –OT
 - OT-2 which is non-functional since last 2yrs.
- Vashi - has one OT
- Types of cases done-
 - Ortho

- urology
- Minimal access surgeries.

(D) NASIK –OPERATION THEATRE UTILIZATION

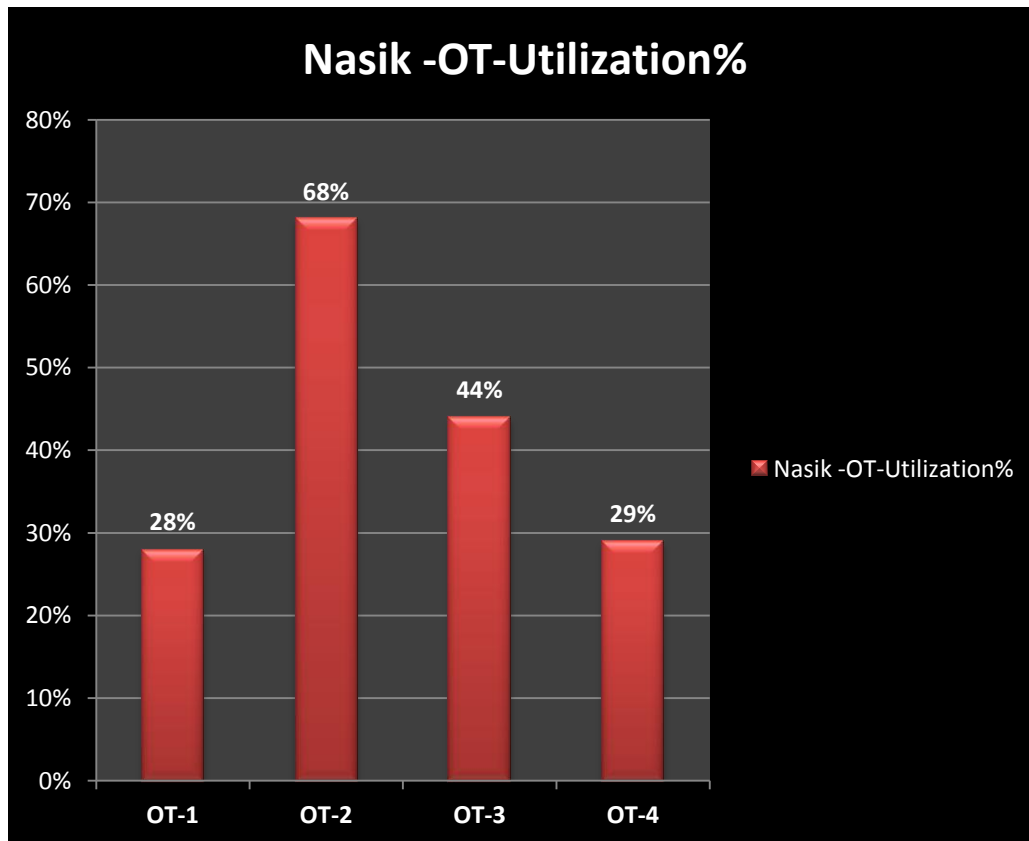


Figure-2.20

- No. of OTs – 4
- All OTs functional for 12hours
 - OT-1 infected cases
 - OT-2 Mixed cases
 - OT-3 ortho cases
 - OT-4 cardiac and spine

2.5.7 (G) SPECIALITY –WISE –EQUIPMENT UTILIZATION

(a) CARDIAC EQUIPMENTS

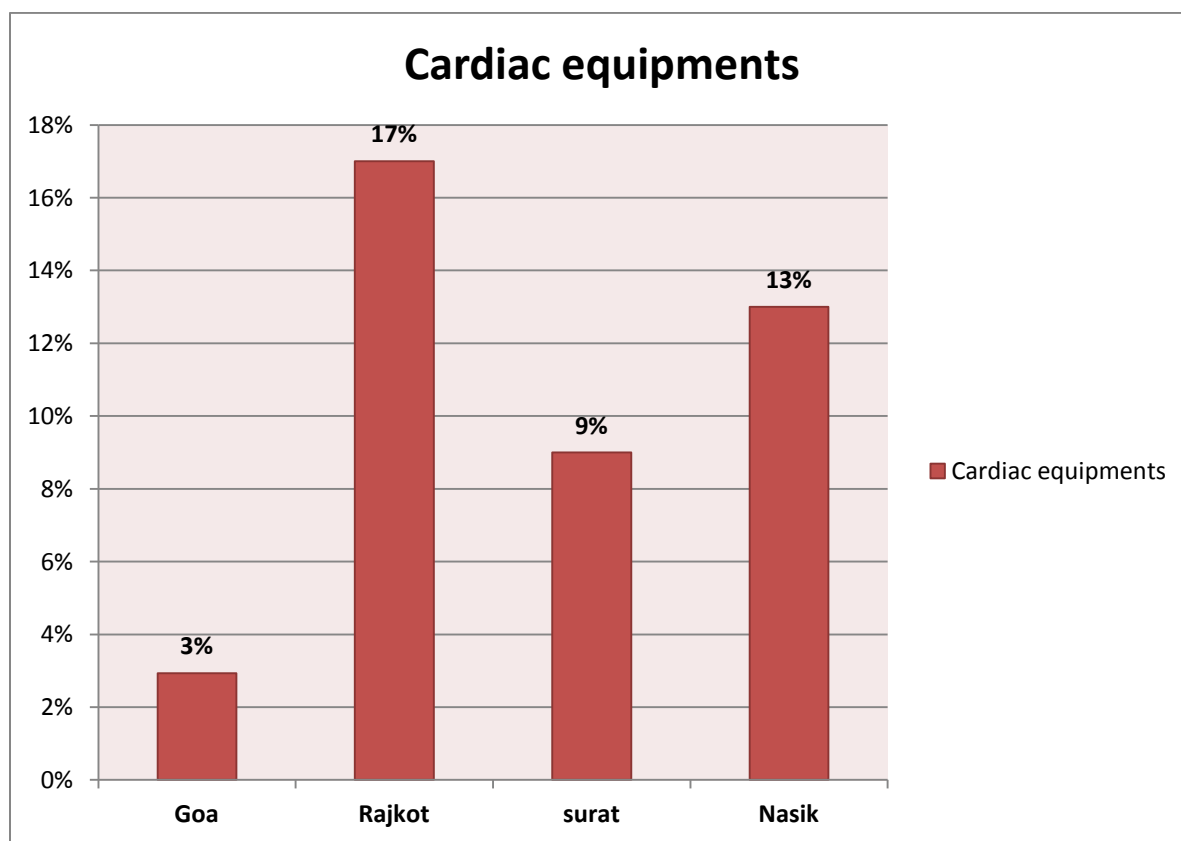


Figure-2.21

- Average monthly volume of cardiac surgeries
 - Goa-2 cases
 - Rajkot-16 cases
 - Surat-5 cases
 - Nasik-11 cases

Cardiac Equipments list-

a. Sternum saw motor

B .IABP

c. ACT MACHINE

d. HEART LUNG MACHINE

(b) ORTHO-EQUIPMENTS

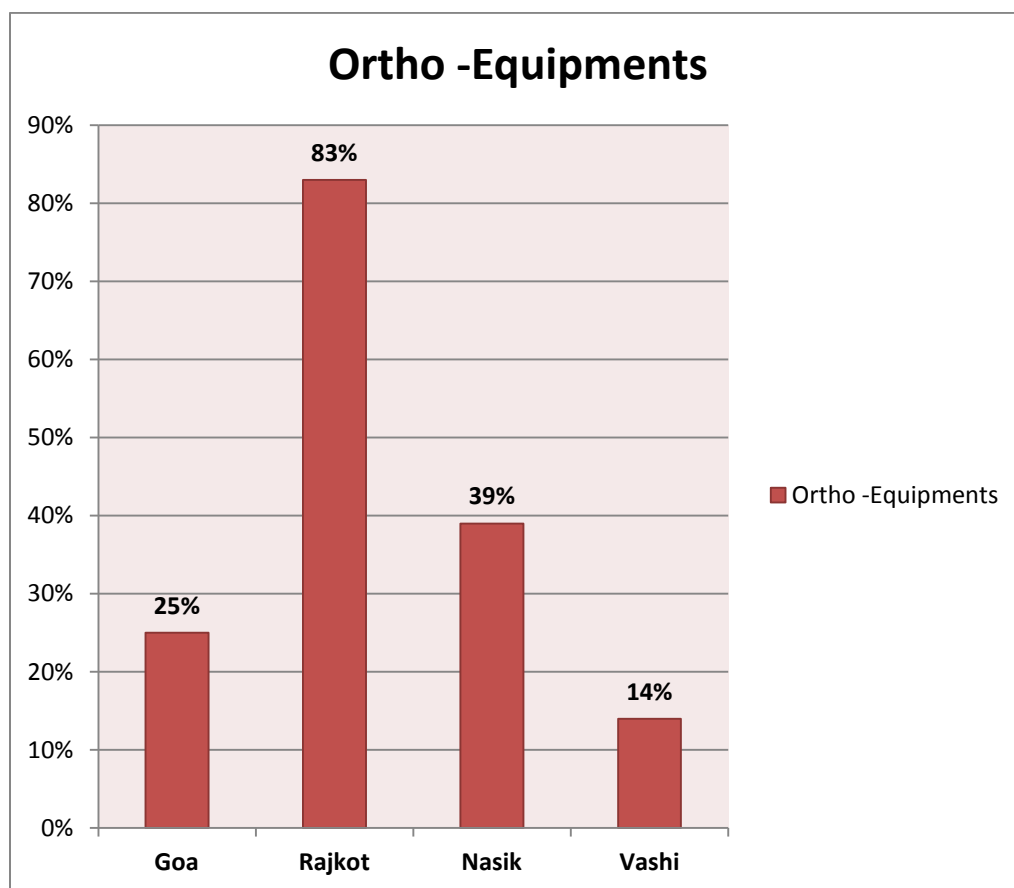


Figure-2.22

Figure 2.22 is showing maximum ortho surgeries are performed at Rajkot

- Average volume of Ortho and replacement cases are taken.
- operational hours except, at Goa-12hrs.
- Ortho equipments –

- Ortho drill
- Cautery machine
- Tourniquet
- C-arm
- Monthly volume-
 - Goa- 20 cases
 - Rajkot-75 cases
 - Vashi – 16cases
 - Nasik- 44 cases

(c) UROLOGY –EQUIPMENTS

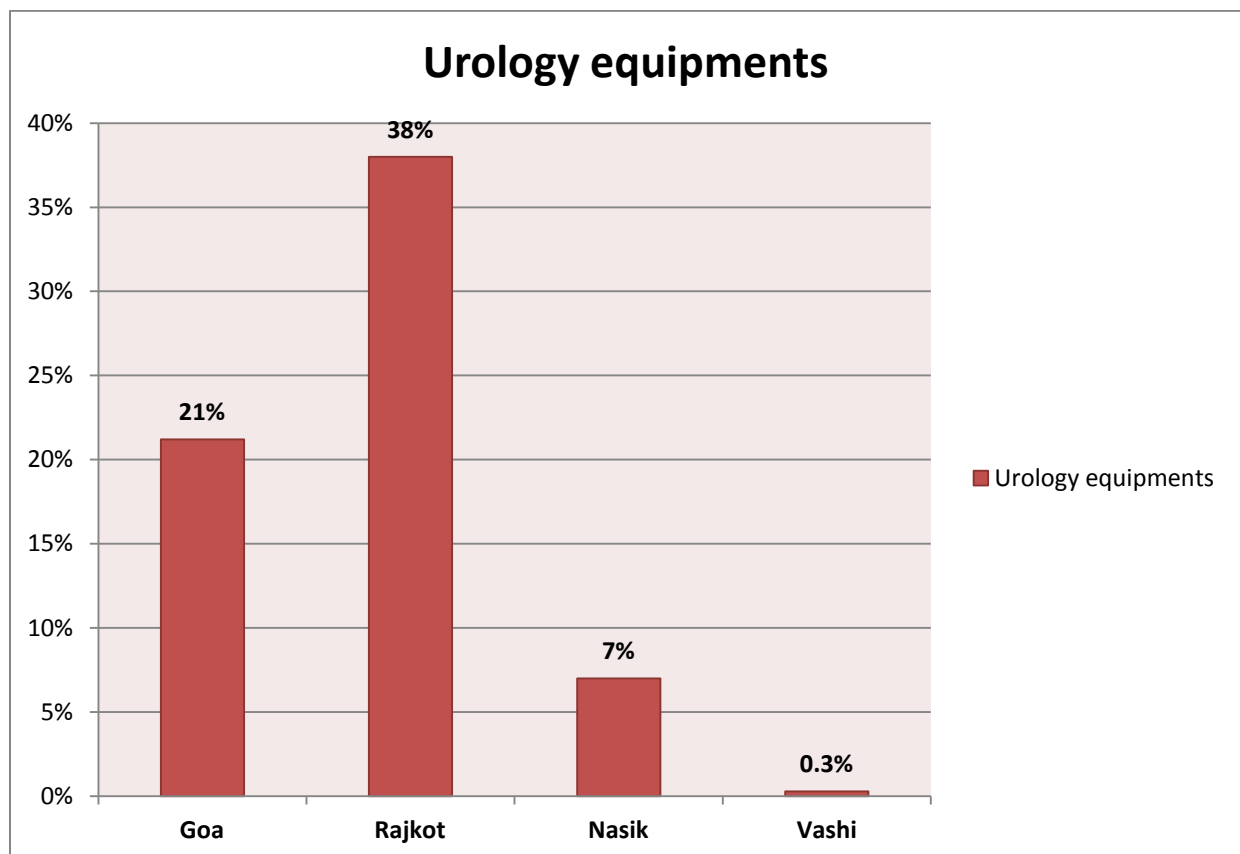


Figure-2.23

Figure 2.23 shows that at vashi urology cases are almost negligible and quite a good percentage at Rajkot and Goa.

- Points of consideration –
- Average monthly volume of uro cases-
- Goa – 88 cases
- Rajkot- 38cases
- Vashi- 2cases
- Nasik- 13 cases
- Surgery time taken for single procedure in Goa is less compared to the same surgery being performed at other locations.
- TURP at Goa –done in average 40mins
- At Rajkot – average in 3:00 hrs

(d) GENERAL and LAPROSCOPIC SURGERY

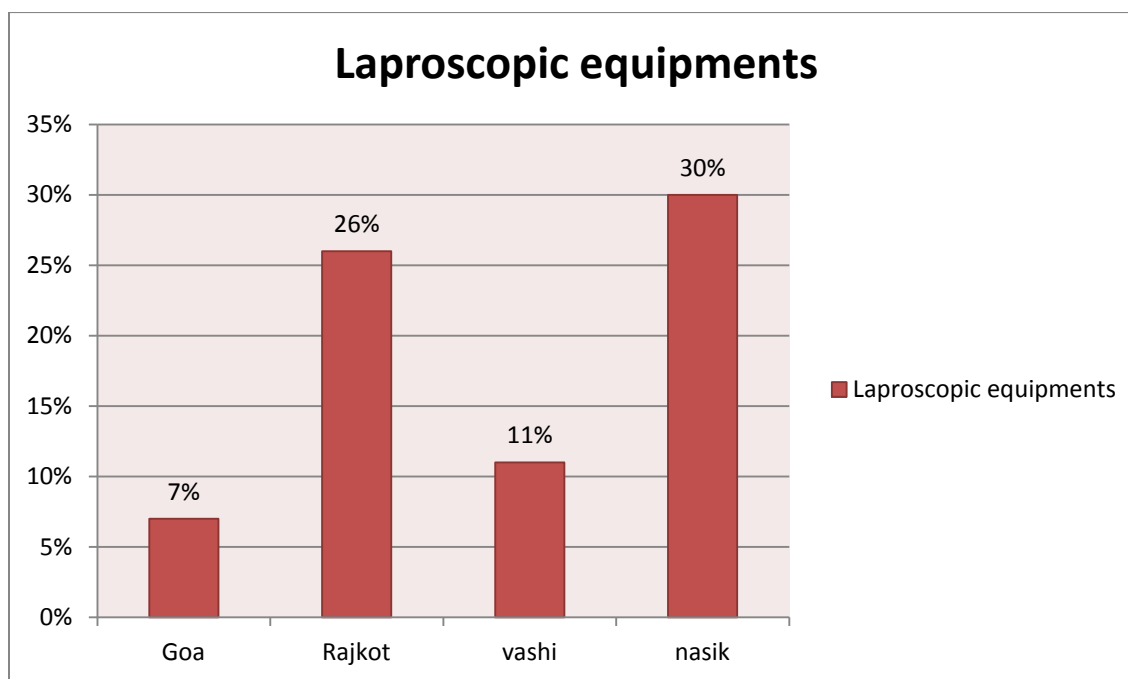


Figure2.25

- Average monthly volume of laproscopic surgeries-
 - Goa – 7
 - Rajkot - 32
 - Vashi -16
 - Nasik- 45
- Laproscopic Equipments
 - Laproscopy system Monitor
 - Image Hub Xenon
 - Endoflator Machine
 - Monitor Endocamera
 - Telecam DXPL
 - Telecam DXPL Monitor
 - Light source, Halogen 250
 - Endocamera Cautery Machine

2.5.8(H) SUPPORT SERVICES

(a) STEAM STERLIZER (AUTOCLAVE)

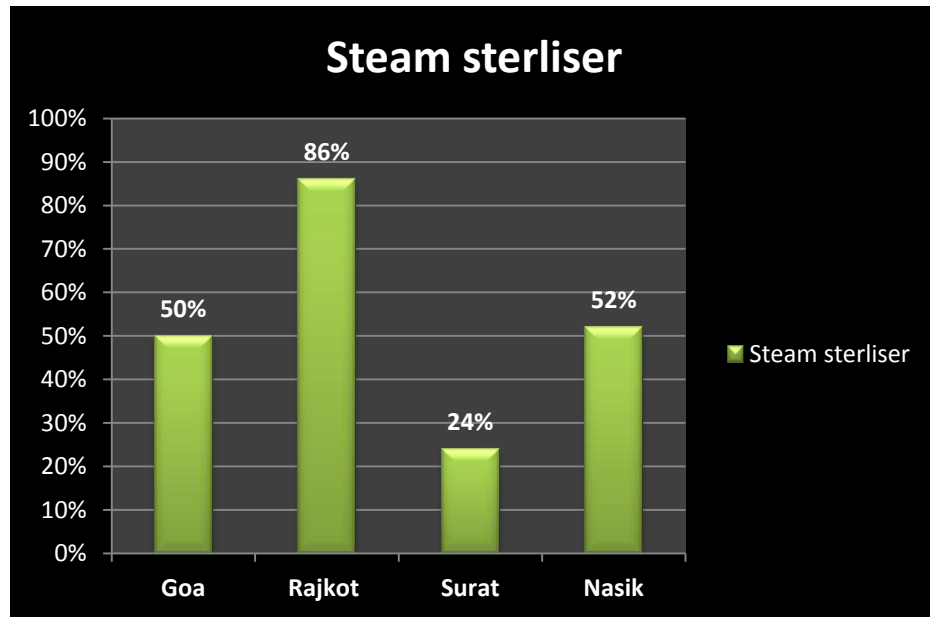


Figure-2.27

- **Points of consideration**
- No. of steam sterliser that each unit has-
 - Goa -2
 - Rajkot-2
 - Surat-1
 - Vashi-1
 - Nasik-2
- Average no. of cycles
- Across the group average no. of cycles per month -169.

(B) ETO

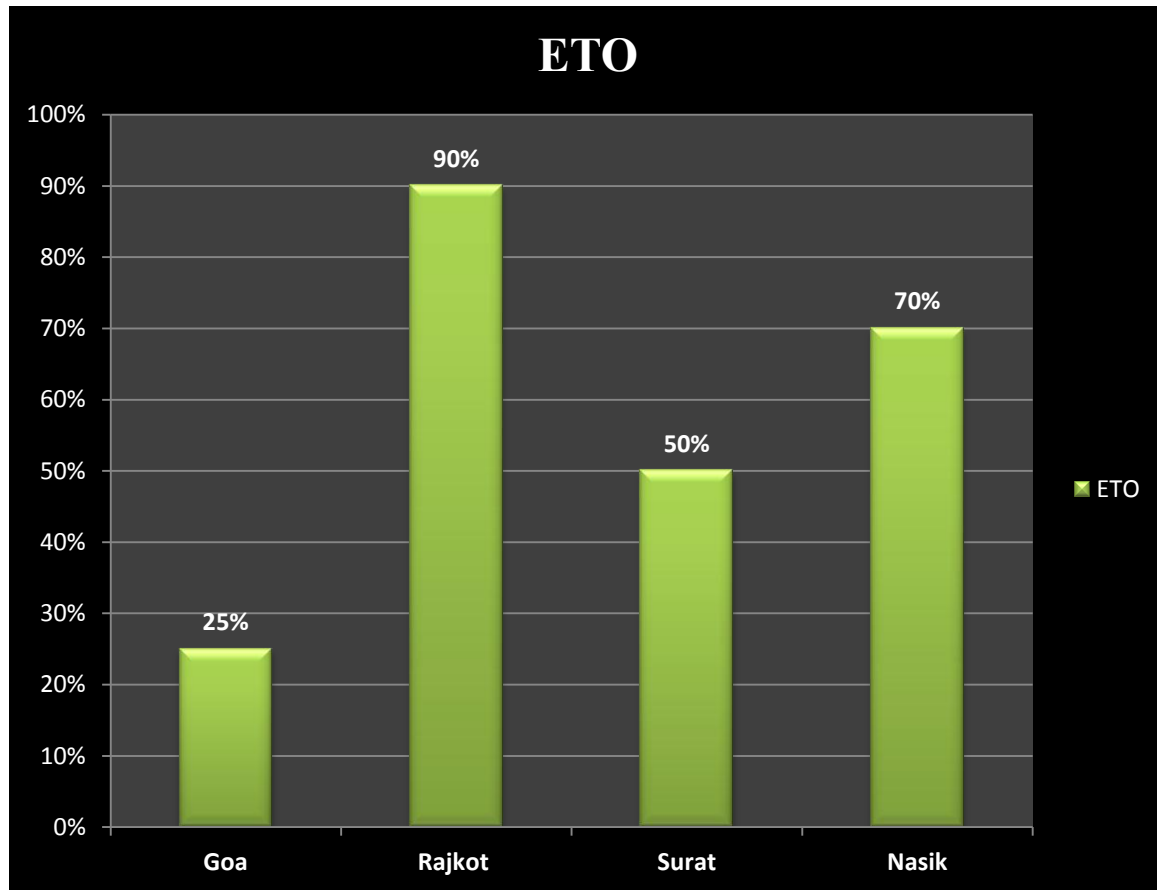


Figure-2.28

- Points of consideration-
- ETO-Sterliser has two cycles
- Cycle used at different locations-
 - Goa – 14hrs cycle
 - Rajkot - 14hrs
 - Surat -12hrs
 - Nasik -14hrs
 - Vashi had no documentation maintained for last year.
- Across the group average no. of cycles per month – 19

2.5.9 (I) LABORATORY EQUIPMENTS

(A) BIO-CHEMISTRY ANALYSER

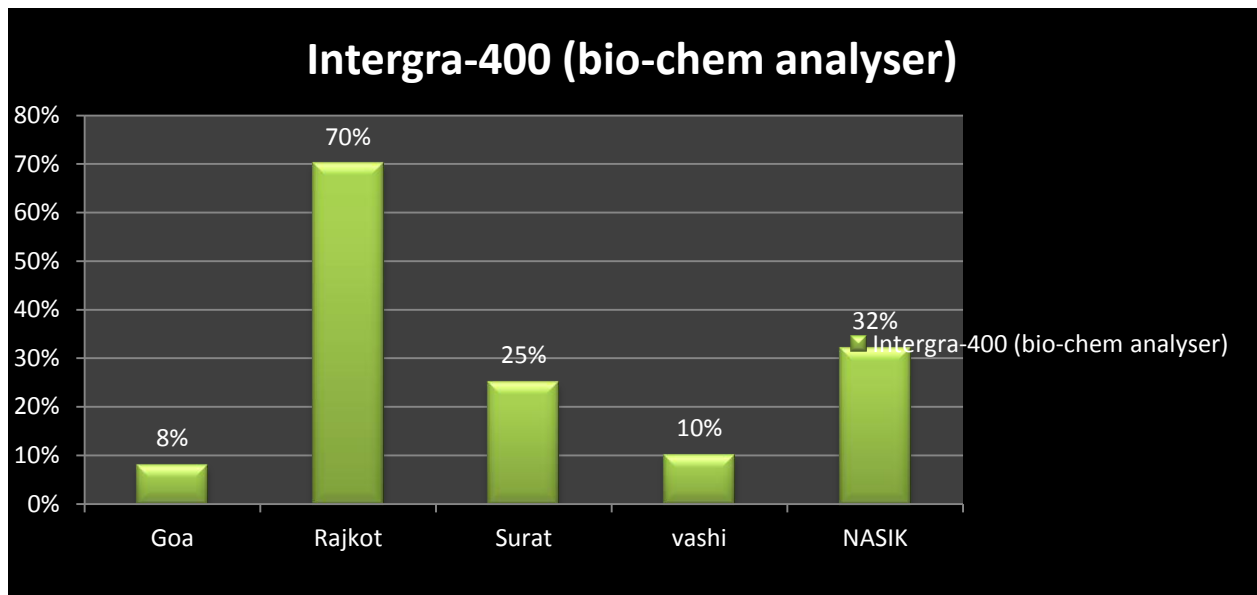


Figure-2.29

- Points in consideration-
- No. of samples that can be taken at once.
- No. of tests that can be performed by one sample.
- Average time taken for one cycle
- Monthly volume of bio-chemistry tests –
 - Goa- 1904 tests
 - Rajkot – 42,056 tests
 - Surat – 10948 tests
 - Vashi -1298 tests
 - Nasik – 11,376 tests

(B) BLOOD CELL COUNTER

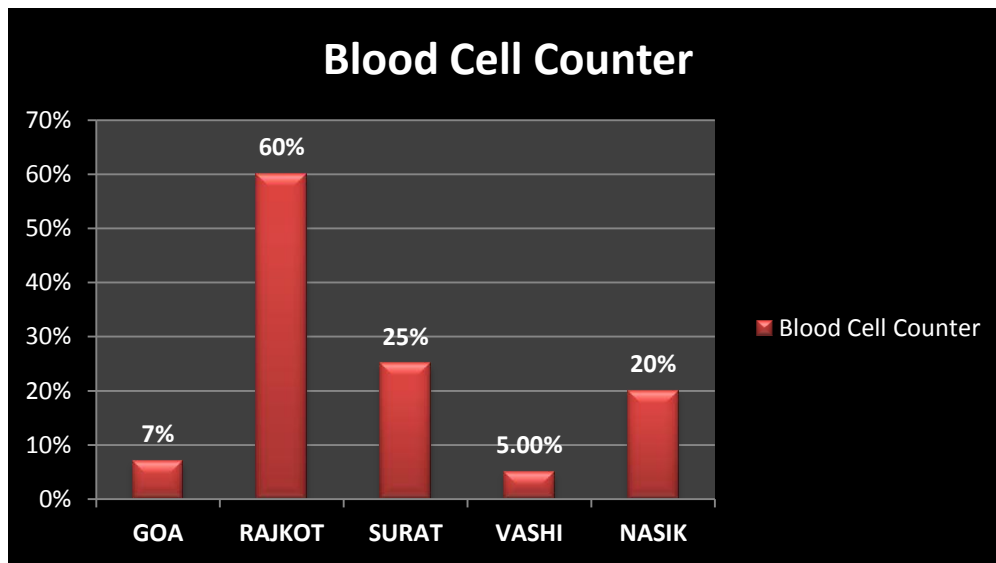


Figure-2.30

- Points in consideration-
- No. of samples that can be taken at once.
- No. of tests that can be performed by one sample.
- Average time taken for one cycle
 - Goa- 675 tests
 - Rajkot- 13,645
 - Surat - 5708
 - Vashi -91 tests
 - Nasik- 3836 tests.

(C)PERCENTAGE OF INHOUSE & OUT-SOURCED TESTS

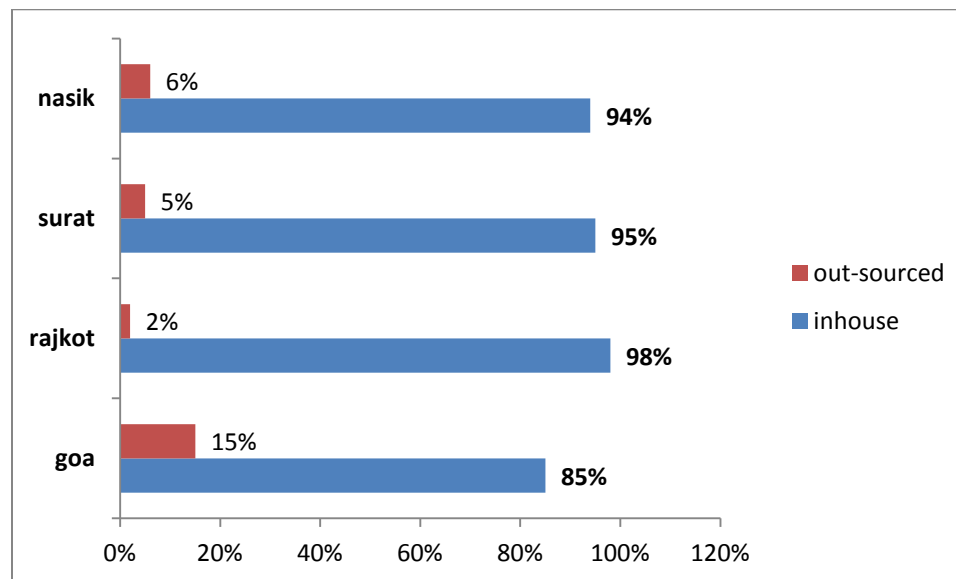


Figure-2.31

Figure 2.31 depicts the percentage distribution of inhouse and outsourced tests at all the locations. Maximum tests are being outsourced at GoA almost 15 percent.

- Points of consideration –
- Volume of cases of in-house and outsourced tests.
- Inhouse tests taken into consideration are-
- A.bio-chemistry tests
- B. Haematology
- C.Clinical pathology tests
- Outsourced tests taken into consideration are –
- A.Microbiology
- B.Histopathology

- **2.6 DISCUSSION** –As we have seen the utilization rate of various equipments at various locations of wockhardt hospital group. It clearly indicates that some measures are to be taken location wise to increase the equipment utilization which includes, Critical equipment at unit bank to be created –where only active no. of ventilators can be utilized .
- Critical- case mix focus to be increased
- Rational deployment of resources
 - Centralized equipment store ,for portable machines which are there at various departments and nursing station from where the equipment can be given on loan basis as per requirement . Critical case mix focus to be increased. GOA-
 - Specialty wise uptake is quite low other than few areas like Urology.
 - Dialysis- infrastructure is there so focus to be made on increasing the no. of patients that can be catered.
 - Operation theatre- out of 5 OTs, 3-OTs shall be closed.
 - Mother and child unit , Aesthetic department is fully equipped and lying ideal so, these equipments shall be relocated to some other location.

RAJKOT –

Dialysis – infrastructure is there, there is only 41% utilization of machines increase the volume of cases that can be catered.

2.7 CONCLUSION- The study aimed to assess the utilization rate of various equipments distributed at different hospitals of the wockhardt group. This study has formed the basis for taking the important strategic decisions regarding the relocation, re-distribution of the equipments as well as to see, if the equipments are not being used and is of no use so the management can cut-down the AMC /CMC/ Insurance cost of maintenance on the equipments.

An indepth assessment at rajkot of the available 596 major standard equipment in various department/functional area, revealed that 85.2% of them were in working order and the other 88 equipment (14.7%) were not in use, although they were in working condition . similarly, at Goa the condition was that out of total 301 equipments, 82% equipments were in use while, 41 equipments that's approximately 14% of equipments were not in use and only 8 such equipments were there which were not-working.

For Surat , functional equipments percentage was almost 86% as compared to non-functional equipments which is approximately 14%.

Similarly,for Vashi functional is to non-functional ratio was – 78% and 22% and for Nasik ,it was around 81% and 19%). The reasons found for non utilization, were -non availability of trained personnel , kept as reserve , non installation, non availability or supportive equipment necessary to operate etc

2.8 LIMITATIONS OF THE STUDY-

- For ventilators, data was not directly available as, intubation and extubation time is not being maintained only intubation and extubation dates are recorded so this data has been taken from the billing cycle where the patient is being charged either as 6hrs or 24hrs
- For Portable-Machines viz. portable ECG in ICU , wards or casualty – no separate register is being maintained for keeping a record

2.9 RECOMMENDATIONS

- Critical case mix focus to be increased.
- Critical equipment bank to be created for ventilators.
- Centralized equipment store ,for portable ECG-machines which are there at various departments or nursing station from where the equipment can be given on loan basis as per requirement .
- Clinically, maintaining the proper data for monthly utilization.
- Overall, footfall is quite low, focus should be made on increasing the volume of cases.
- though, there are certain equipments for which the utilization rate is low but, there is still a scope of improvement
- Templates shall be created where on six-months or yearly basis data can be captured.

Department name	Equipment name	Total no. of cases in a month	Average test/procedure duration	Total time for which machine used	Functional hours of department

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ANNEXURE A

RADIOLOGY FORMAT -

s.no	Date	Time-in	OPD/IPID No.	Patient name	Department (CT/MRI)	Technician name	Remarks	

ANNEXURE A.2

For calculating the TAT (MIS)this format was being followed which doesn't include the time-out of patient i.e. procedure end time simply includes the time from entry to exit(time when his reports are being despatched) .

UHID No.	Order no.	Patient name	test	department	Order date time	Acknowledged date ,time	Report given date ,time

ANNEXURE B

Endoscopy Procedure Documentation format -

s.no.	date	Procedure	Time-in	Time-out	Doctor's name

ANNEXURE C.

NON-INVASIVE DIAGNOSTIC TESTS Format -

s.no	date	Patient name	Age/sex	UHID	Bill no.	Drs name	Done by- technician's name

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