

**TIME MOTION STUDY FOR OUTPATIENT & RADIOLOGY
DEPARTMENT AND GAP ANALYSIS OF THE PROCESS:
A DESCRIPTIVE STUDY AT RAJIV GANDHI CANCER
INSTITUTE AND RESEARCH CENTRE, ROHINI, NEW DELHI**

Dissertation Submitted to



The IIHMR University, Jaipur

for the partial fulfillment for the award of the
degree of Master of Business Administration

(MBA)

in

Hospital and Health Management

by

Dr. Himani Bhati

Under the Supervision and Guidance of

Prof. Monika Chaudhary

2020-22

DECLARATION BY STUDENT

I hereby declare that this dissertation titled “TIME MOTION STUDY FOR OUTPATIENT & RADIOLOGY DEPARTMENT AND GAP ANALYSIS OF THE PROCESS: A DESCRIPTIVE STUDY AT RAJIV GANDHI CANCER INSTITUTE AND RESEARCH CENTRE, ROHINI, NEW DELHI” is the bonafide record of my original research work. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

(Signature)

Name- Dr. Himani Bhati

Date- 30/06/2022



**Rajiv Gandhi Cancer Institute
and Research Centre**

HR/22

24/06/2022

TO WHOMSOEVER IT MAY CONCERN

We are glad to inform you that **Dr. Himani Bhati** from **IHMR University, Jaipur** has completed her internship at **Rajiv Gandhi Cancer Institute and Research Centre, Delhi** from **11th April 2022 to 24th June 2022**.

She has worked on a project titled '**Gaps in the Present Operational Mechanisms**'. This project aims to improve Patient Satisfaction and Patient Delight. As part of the project, she covered time taken in Admission & Discharge, waiting time at registration Counter, OPDs, Pharmacy, Day Care, investigations and reports, response to Nursing Call Bells, and time spent by doctors in Consultation.

We found her extremely inquisitive and hardworking. She was very much interested to learn the functions of our core division and also willing to put her best efforts and get into the depth of the subject to understand in better.

We wish her all the best for her future endeavor.

Rekha Sharma
Manager -HR

REKHA SHARMA
Manager
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ABSTRACT

Objective: The objective of the study is to analyze the time motion study at OPD and radiology department. To perform the gap analysis of both the departments and to provide ways to overcome challenges causing gaps in the process flow.

Methodology: It is a descriptive, cross sectional and quantitative study in the OPD and Radiology Department of RGCI&RC, Rohini, New Delhi where the sample size of 104 for OPD and 112 for Radiology Department was collected using a simple random technique and some secondary data was also collected for radiology department for analysis. We also interviewed doctors to know more about the departments and challenges faced by them. The study was conducted in the duration of 11th April 2022 to 25th June 25, 2022. Tools and techniques used for the study are checklists, MS excel and MS word.

Key Results: After completing the study we found out that in OPD the patient spent 2 hours 20 minutes on an average, from entry in the hospital till exit if he came for consultation only or for second opinion. And in this process the maximum time was taken for waiting in the OPD for consultation which is of 36 minutes and 45 seconds. After that if he/she went for some other investigations or to visit the other departments it will take around 3 hours 57 minutes. And for Radiology Department the maximum time taking process is CT scan which is of 2 hours 22 minutes and 4 seconds.

Conclusion: We concluded that main problem is the waiting time before the processes whether it is OPD or Radiology.

Key words: OPD, Radiology Department, RGCI-RC, Time Motion study (TMS), Waiting time

ACKNOWLEDGEMENTS

First of all, thanks, and praise to almighty for showering his blessings throughout my journey to complete the project.

I would like to express my sincere gratitude and thanks to the Dissertation opportunity I had with Rajiv Gandhi Cancer Institute and Research Centre, Rohini, New Delhi. It was a great honor and experience to work with such splendid personalities.

I am indebted to Dr. Pinky Yadav (Medical superintendent), Mr. Rajesh Thacker (Chief Financial Officer), Mr. Biswajit Das (GM-HR) and Mrs. Madhumita Dhal for providing me the opportunity to perform the research and for guiding me throughout the training. I would also like to give a very big thanks to Mrs. Rekha Sharma for her guidance, support, and motivation during tough times. It was a great privilege to work and learn under their leadership.

Most importantly I would like to express my gratitude and thanks to my mentor Prof. Monika Chaudhary (IIHMR University, Jaipur) for her constant guidance and support throughout the study.

Sincerely,

Dr. Himani Bhati

Place: RGC & RC, Delhi

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ABBREVIATIONS

TAT	Turn Around Time
TMS	Time Motion Study
OPD	Outpatient Department
DMAIC	Define-Measure-Analyze-Improve-Control
RGCI-RC	Rajiv Gandhi Cancer Institute and Research Centre
IAU	Initial Assessment Unit
PAC	Pre Anaesthesia Check-up
OT	Operation Theatre
CT-SCAN	Computed Tomography
MRI	Magnetic Resonance Imaging
USG	Ultra Sonogram
FNAC	Fine Needle Aspiration Cytology
DEXA	Dual-Energy X-ray Absorptiometry
ECG	Electrocardiogram
EBUS	Endobronchial Ultrasound
2D-ECHO	2-Dimensional Echocardiography
PET-CT	Positron Emission Tomography and Computed Tomography
IT	Information Technology

CHAPTER 1: INTRODUCTION

Quality of the product or any service has a very crucial role in its sale and efficiency of the organization giving that product or service. TAT is the turnaround time which set the benchmark for an organization's efficiency. A delay in TAT signifies the bad quality delivering system of the organization. TAT aware the organization about the challenges and the factors that it is facing in the delivering system and thus the organization can take certain steps to remove or overcome that situation and can provide the required services with maximum potential and minimum delay or no delay to its consumers. TAT acts like a filter for an organization's image, a good TAT describes the positive image of the organization and delay in TAT signifies some type of lag or lack is there in the organization with dealing its consumers and it also signifies the number of individuals who are not satisfied with the organization delivering system. Every organization needs to do TAT study at a regular interval of time in order to know the challenges that are faced by its consumers and creating some solutions ways to overcome those problems. A gap analysis is a type of methodology to find the gap to bridge from unsatisfaction to the satisfaction of the clients. A gap analysis also helps to find the flaws in several departments and activities on which the organization can work to improve the standards and thus the proficiency and efficiency of the whole system can be increased. The main purpose of the study is to find out the turn around time of the OPD and Radiology Department and to find out challenges faced by the patients and staff and to provide solutions for the challenges and gaps to improve the process flow and to deliver the best services to the patients.

CHAPTER 2: REVIEW OF LITERATURE

1.TITLE - A TIME MOTION STUDY TO EVALUATE THE AVERAGE WAITING TIME IN OPD WITH REFERENCE TO PATIENT SATISFACTION IN THE SETTING OF STATE-LEVEL AYUSH HOSPITAL (INDIA) Year- 2019 Authors- Farah Naaz	The goal of this study was to examine the services provided by AYUSH hospitals in order to identify any gaps in the system, contribute to its improvement, and promote accessibility for the general public. To determine the average patient wait time and the degree of patient satisfaction with the hospital's services, a time-motion study (TMS) involving 100 patients from the state-level AYUSH Hospital in New Delhi was carried out. This study took 15 working days to complete. Direct patient interviews and TMS were used to collect the data. According to the research, a patient typically spent close to two hours in the OPD from arrival to departure. The consultation period, which lasted one hour and ten minutes, was a key contributor to the lengthy wait time, and nearly 16 minutes at the drugstore. Additionally, a patient's consultation with a doctor lasted an average of 3 minutes.
2.TITLE- A REVIEW ON TIME MOTION STUDY IN OPD OF TERTIARY CARE EYE HOSPITAL IN INDIA Year- 2020 Authors- 1. Ram Iswar Sah, 2.Mrs.Rakhi Ahuja, 3. Dhiraj Kumar Singh,	Congestion and extended waiting time in the eye OPD for treatment created several problems for patients, medical staff as well as management. Purpose of the time-motion study to know the time is taken in every workstation in OPD and regarding the value time, non-value time and total time spent patient in OPD. Time-

4. Dr. Imran Ahmed, 5. Dr. Mukesh Savaria	motion studies analysis different queues which create bottlenecks situation in different workstation. The Time-motion indicator plays a vital role in patient satisfaction in OPD. Some tool like Lean Six Sigma which is the latest methodology in healthcare. It focuses on improving process, continuous quality improvements and increasing patient's satisfaction by removing non-value time in OPD.
3.TITLE- FIVE YEAR FOLLOW-UP OF ROUTINE OUTPATIENT TEST TURNAROUND TIME: A COLLEGE OF AMERICAN PATHOLOGISTS Q-PROBES STUDY. Year-2003 Authors- P. Valenstien, M. Walsh	The study Tool was descriptive cross sectional one where 118 laboratories prospectively recorded the collection to verification turnaround time for 9252 complete blood cell counts, 8832 thyroid tests etc and the study concluded that the turnaround time was found to be essential to know the challenges behind the delay in the workflow and thus got the way to deal with them and to increase the efficiency and proficiency of the laboratories.
4.TITLE-A LEAN SIX SIGMA APPROACH TO REDUCE WAITING AND REPORTING TIME IN THE RADIOLOGY DEPARTMENT OF A TERTIARY CARE HOSPITAL IN KOLKATA YEAR-2016 AUTHORS-Dr (Brig). A. P. Pandit Ms. Tanima Deb Mallik	A Lean Six Sigma (DMAIC) approach was taken to study the issue of the imaging services cycle turnaround time (TAT) of the Radiology Department of a Tertiary care Hospital Kolkata. By conducting a Gemba Walk interview (Annexure 1) and Time motion study (Annexure 2), the entire process was mapped and areas causing delay were identified in the defining and measuring stage. Pareto analysis yielded the root causes of delay in the analysing stage. In the intervention stage practical approaches were undertaken to increase patient orientation and

	preparedness for the scan thereby decreasing pre-test waiting time and streamlining of operations. The reporting process ultimately aided in reduced pre-test and post-test waiting times.
5.TITLE- A TIME MOTION STUDY OF HEALTHCARE DELIVERY SYSTEM AT GENERAL OPD OF RURAL HOSPITAL OF WEST BENGAL YEAR- 2020 AUTHOR-Biswadeep Sengupta, Pankaj Kumar Mandal , Arkadeb Kar , Nabanita Bhattacharyya , Shounak Biswas	BACKGROUND: Hospital administration has a significant difficulty as a result of OPD overcrowding and lengthy wait times. OBJECTIVE: In order to determine how much time was spent in each section of the service delivery process and how satisfied patients were with the overall length of their stay in the OPD, a time motion study was carried out on about forty patients in the OPD of the Domjur Rural Hospital using a straightforward observation technique. METHOD: Data gathered through a patient interview and a basic observation technique. RESULTS: We watched and quantitatively analysed the average wait time in various areas. The study found that patients spend the majority of their time waiting outside of the OPD for consultations, while actual appointment time is quite short. Patients were also surveyed regarding their satisfaction, and hospital management received recommendations for the use of more modern methods to ease OPD congestion.

CHAPTER 3: METHODOLOGY

Research Questions: What is the Average Turnaround Time of Outpatient Department and Radiology Department of Rajiv Gandhi Cancer Institute & Research Centre?

What are the leading factors in increasing the Turnaround Time of OPD and Radiology Department at Rajiv Gandhi Cancer Institute and Research Centre?

Objectives:

- 1) To analyze the Time motion study at OPD.
- 2) To analyze the Time motion study at Radiology department.
- 3) To perform the gap analysis of both the departments.
- 4) To provide ways to overcome challenges causing gaps in the process flow.

Research Design: It is a Descriptive, Cross Sectional and Quantitative Study.

Study Setting: Outpatient Department and Radiology Department at Rajiv Gandhi Cancer Institute and Research Centre, Rohini, New Delhi.

Study Population: Outpatients visiting the OPD and Radiology Department of RGCI-RC either for consultation, follow-ups or second opinion.

Exclusion Criteria: All the patients who have visited other departments of the hospital other than the concerned departments.

Study tools- Checklist, MS-excel and MS-word.

Checklists were prepared to collect the data of the patients, MS-excel was used to prepare the graphs, pie-charts and for data analysis. MS-word was used to make the entire project report.

Duration of Study- from 11th April to 24th June

Sample Size- 104 persons who visited OPD of Rajiv Gandhi Cancer Institute and Research Centre at the time of study.

112 persons who visited Radiology Department of Rajiv Gandhi Cancer Institute and Research

Centre at the time of study.

Sampling Technique- Convenient Sampling

Data Collection Procedure- For data collection the patients were accompanied along with a checklist from entry in the hospital till exit for OPD and for Radiology Department patients were accompanied using checklist to collect data on their motion throughout the process of Radiological investigation at different levels.

Though this method is very intense but helps to study the functional accuracy of the hospital. For radiology department secondary data was also collected to find out the work load on the radiologists while reporting the cases.

Operational definitions- TAT: It is the time interval between the patient enters in the hospital and when he/she exits the hospital after consultation for OPD. And for radiology it is the time interval from the registration process to the collection of report.

Gap Analysis: To assess the difference between expected performance and the actual performance of the hospital and hospital staff in delivering the healthcare services according to patient's needs.

CHAPTER 4: RESULTS

OUTPATIENT DEPARTMENT

The outpatient department (OPD) is the first point of contact of a hospital with patients and serves as the shop window of the hospital. The care in the OPD indicates the quality of services provided by the hospital and is reflected by patient satisfaction. Overcrowding contributes significantly to patient dissatisfaction because of the long waiting and less consultation time. The goal of this study was to examine the services provided by the RGCIRC in order to identify any gaps in the system, contribute to its improvement, and promote accessibility for the general public.

To determine the typical wait time for patients in hospitals, a time-motion study (TMS) including 104 individuals was carried out.

For the purpose of data analysis, the sample size of 104 is divided into two parts that is 61(Patients who exited the hospital just after the consultation) and 43(who visited other departments after consultation). The purpose is to categorize the patients into two different segments the one who exit the hospital immediately after consultation. The other patients are those who availed other available services in hospital after consultation.

Total no. of patients	104
Patients who exited the hospital just after the consultation	61
Patients who visited the other departments after consultation	43

PROCESS FLOW:

The May I Help You Desk, conveniently positioned close to the main Reception, directs patients to the appropriate OPDs, IPDs, and support service locations.

All new patients who come to the hospital for the first time are registered at the Registration Counter in the main Reception area. In order to track the patient's progress through therapy, a Central Registration Number (CR.NO) is generated, and a medical records file is created for the patient.

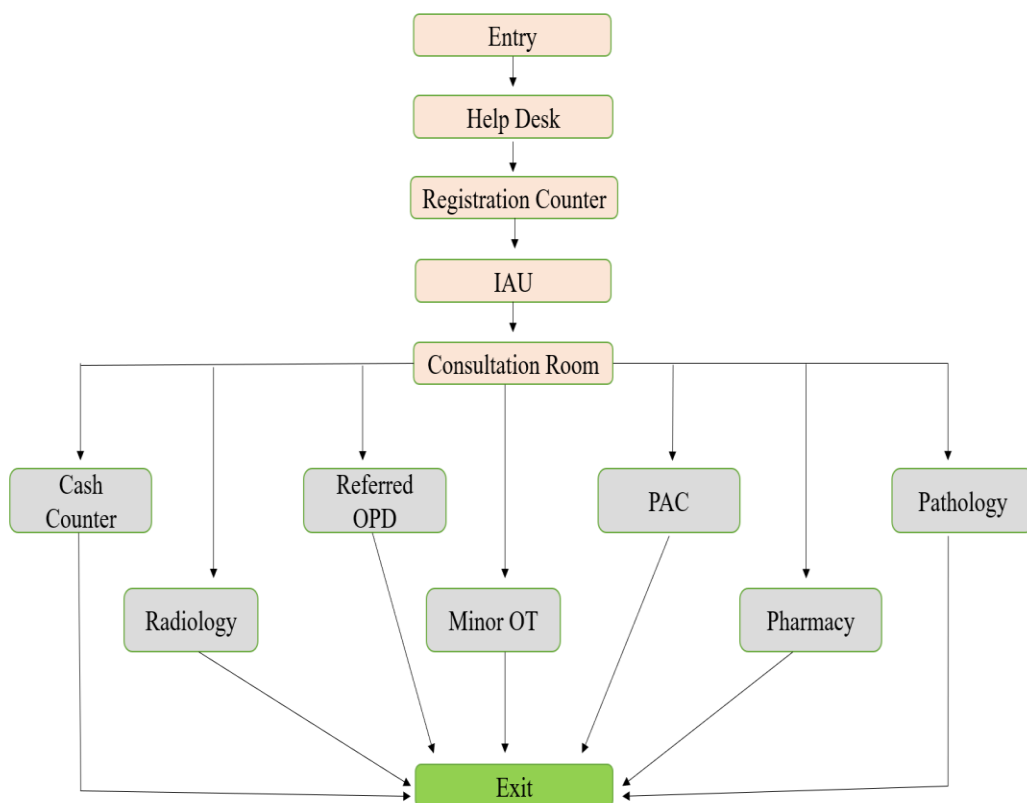
For registration, the patient must submit a copy of their Pan Card or Aadhar Card as well as documentation of their address and photo ID. A copy of the patient's passport must be provided for international patients (First page, Last page and Visa page).

All OPD regions have Initial Assessment Units (IAU). To make sure that nothing is missed when making a diagnosis, a thorough patient history, past medical history, and history of the current condition are taken here.

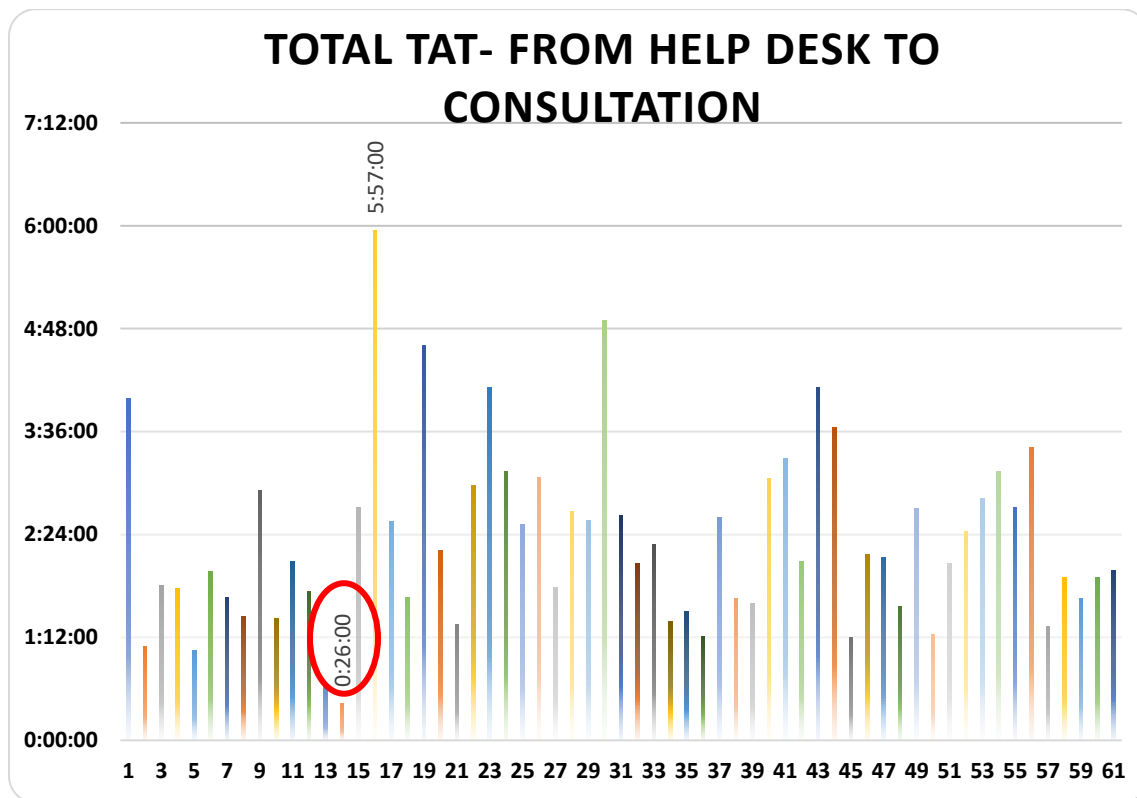
All OPD areas have sample collection rooms for lab inquiry. Pneumatic Tube Chutes are linked to these for rapid sample delivery in the lab.

All relevant OPD areas have dressing rooms, PICC line dressing rooms, ostomy care rooms, and procedure rooms.

In OPDs, a triage service is available to examine patients' vital signs and identify cases that need urgent attention.

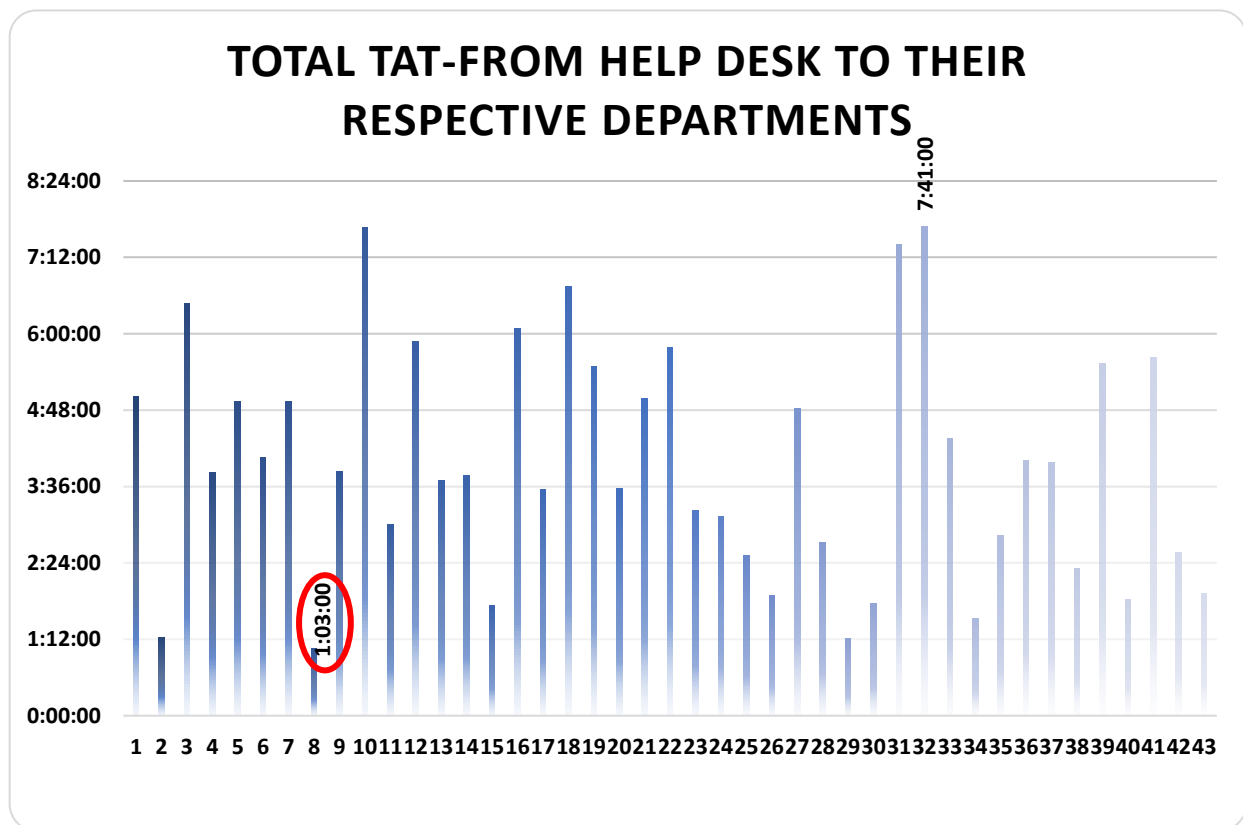


TAT TILL CONSULTATION:



This graph shows the total time taken in the process when patient enters in the hospital and leave the premise just after the consultation as some patients visits only for second opinion and some wants their investigation done from outside. **Average time taken** for the OPD process from help desk till the consultation is **2 hours 19mins 52secs**. Maximum time taken in this process is 5hours 57mins and the minimum time taken is of 26 minutes. Possible reasons for the high peaks are because some of the patients got critical during the process and then they are admitted in the emergency for stabilization.

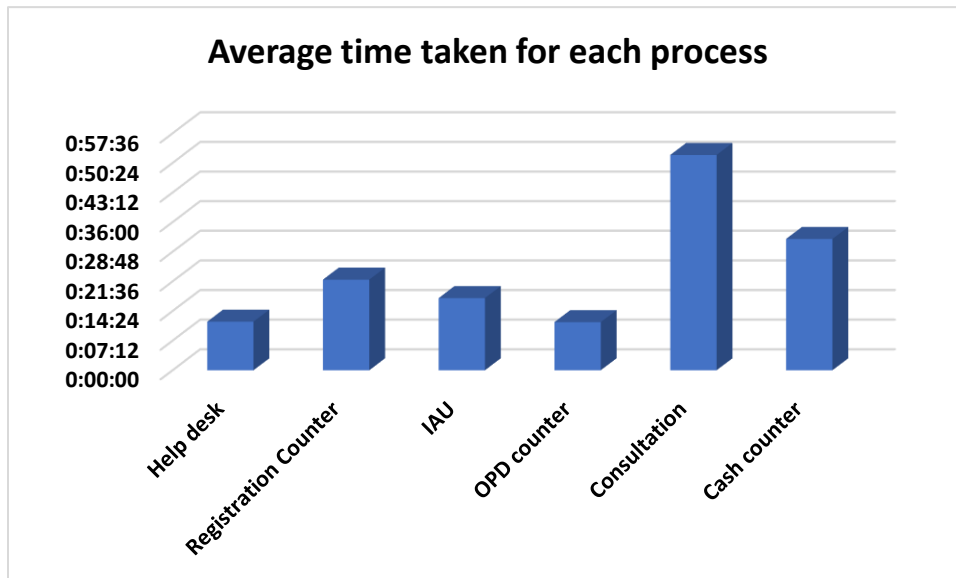
TAT FROM HELP DESK TILL RESPECTIVE DEPARTMENTS:



This graph depicts the total time taken by the patients who visited their respective departments after consultation whether it is radiology, pathology, PAC, pharmacy, minor OT or referred to another doctor for reference. **Average time taken** for this process is of **3 hours 57 mins and 28 secs**. Maximum time taken is 7 hours 41 mins and minimum time taken is of 1hour 3 mins. Possible reasons for high peaks are because some of the tests and processes need to be done empty stomach and pts are not aware of that nor pre informed so they made to wait for 2 to 3 hours before the procedures like TMT, CT-scans, USGs etc.

TAT OF EACH PROCESS IN OPD PROCESS:

Total TAT	
Process name	Average time taken
Help desk	0:11:49
Registration Counter	0:22:02
IAU	0:17:33
OPD counter	0:11:42
Consultation	0:52:20
Cash counter	0:31:55

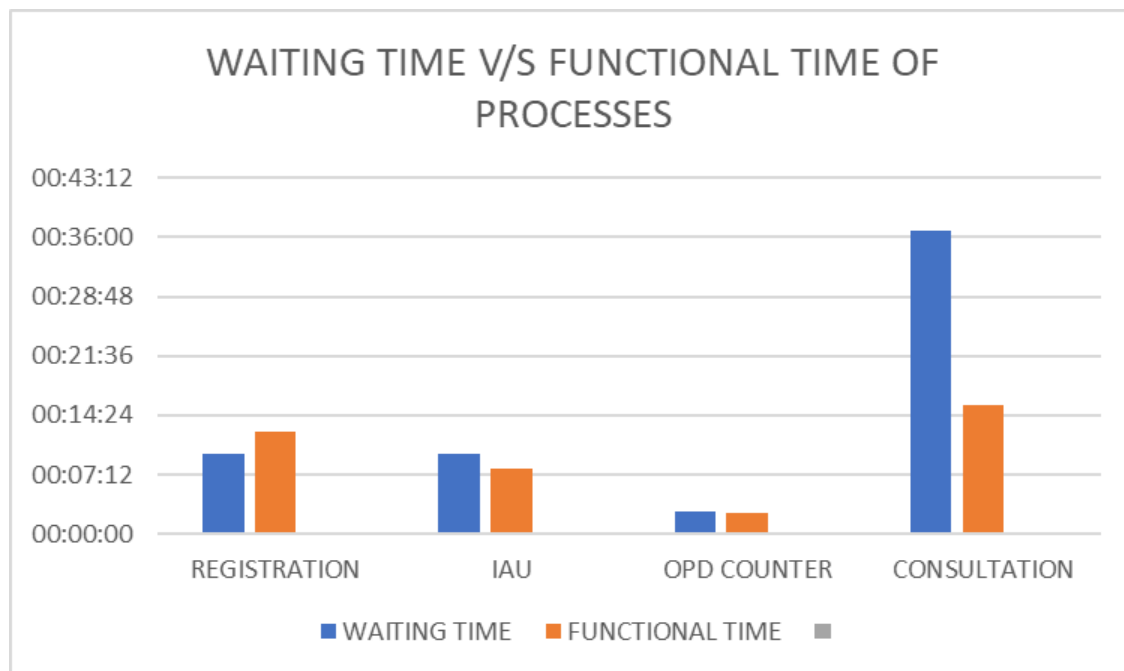


This graph shows the average time taken at each process from entry of patient at the hospital at help desk till after consultation when he visited the cash counter. Average time taken at the help desk is of 11mins 49 secs. After that when patient moved towards registration counter that process of registration takes around 22mins 2 secs on an average. Then patient goes for primary checkup in initial assessment unit where it takes around 17 mins 33 secs. After that he have to move towards the OPD counter for token collection where it takes 11mins 42 secs on an average. Average time taken for consultation is around 52mins 20 secs. The maximum time taking process is consultation because due to high patient load patient made to wait for consultation and sometimes this also happens that doctor is not present in the consulting room but patients were not informed about that and they have to wait for longer period. After consulting the doctor patient goes to the cash counter according to the advice of the doctor whether doctor prescribed for further investigation or referred to the another OPD.

TABLE OF SEPARATED WAITING TIME AND FUNCTIONAL TIME

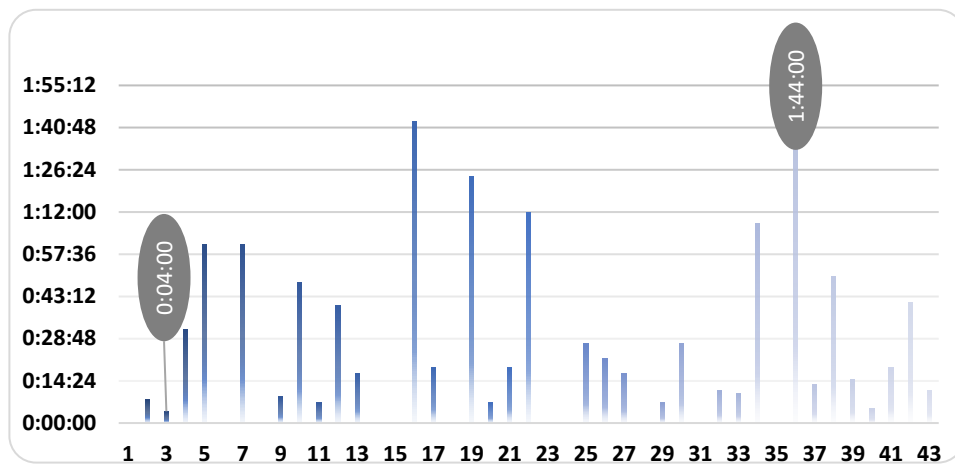
	WAITING TIME	FUNCTIONAL TIME
REGISTRATION	0:09:39	0:12:23
IAU	0:09:42	0:07:51
OPD COUNTER	0:02:49	0:02:35
CONSULTATION	0:36:45	0:15:35

BETWEEN WAITING TIME AND FUNCTIONAL TIME:



Earlier we explained the total time taken at the processes including the waiting time. But above graph explains the waiting time and functional time of the processes separately. Maximum waiting time is before consultation because due to high patient load patient made to wait for consultation and sometimes this also happens that doctor is not present in the consulting room but patients were not informed about that and they made to wait for longer period.

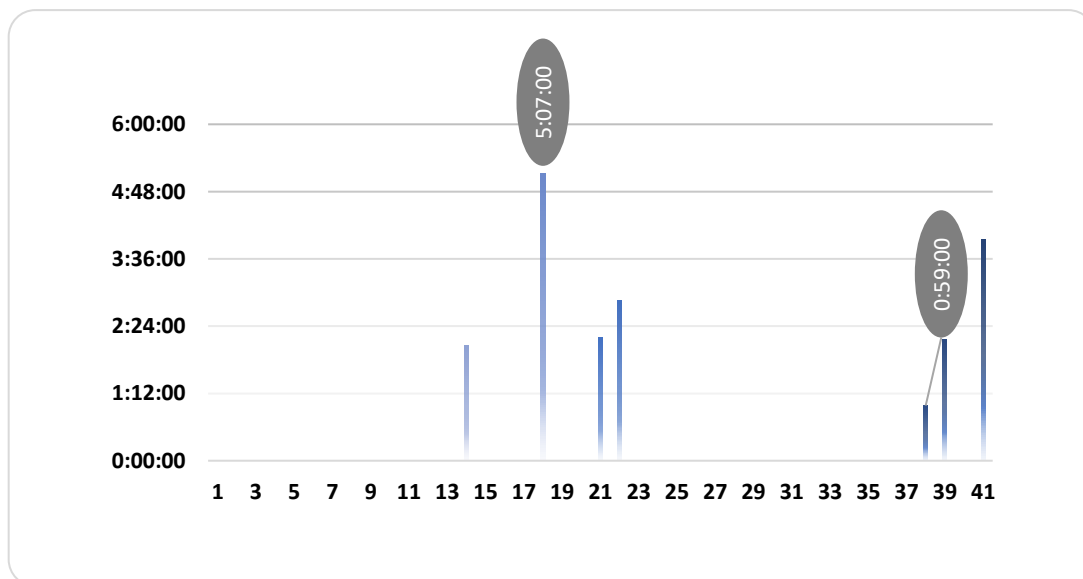
TIME TAKEN AT CASH COUNTER



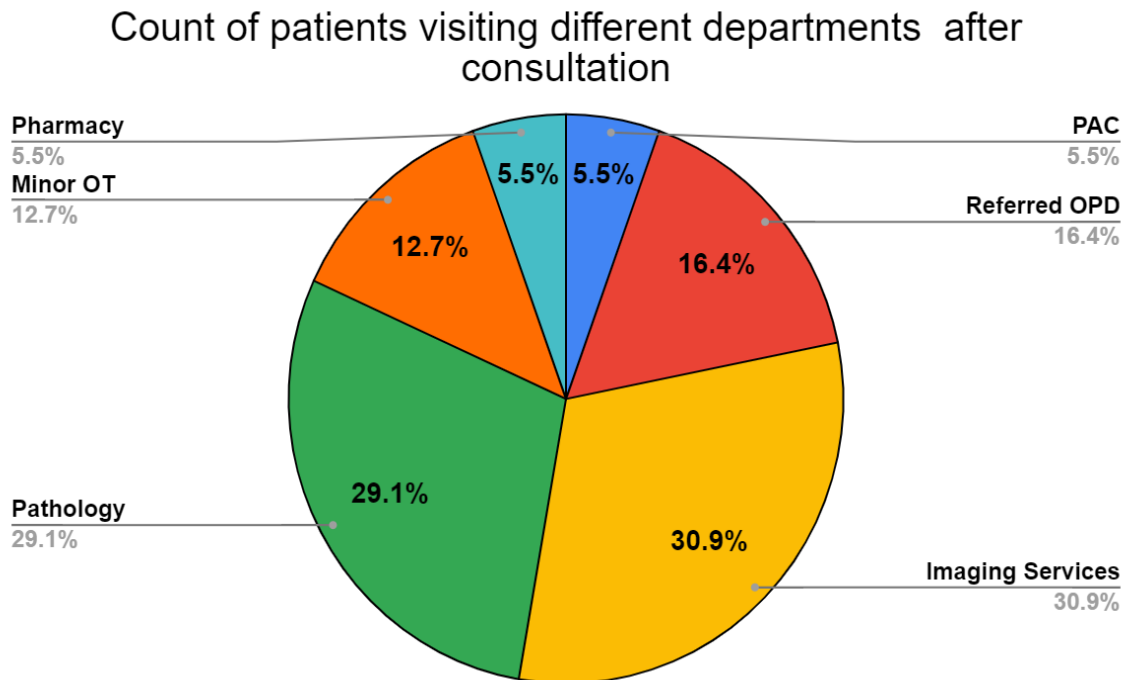
After consultation patient goes to the cash counter for billing of the further procedures, Average time taken at the cash counter is 31 minutes 55 seconds. Minimum time taken is of 4 minutes and the maximum time taken for billing is of 1 hour 44 minutes.

The possible reason for the long waiting time is because only ground floor Cash counter is functional most of the time although there are cash counter at each floor where OPDs are functional but rest other cash counters divert their crowd to the ground floor.

TIME TAKEN AT MINOR OT

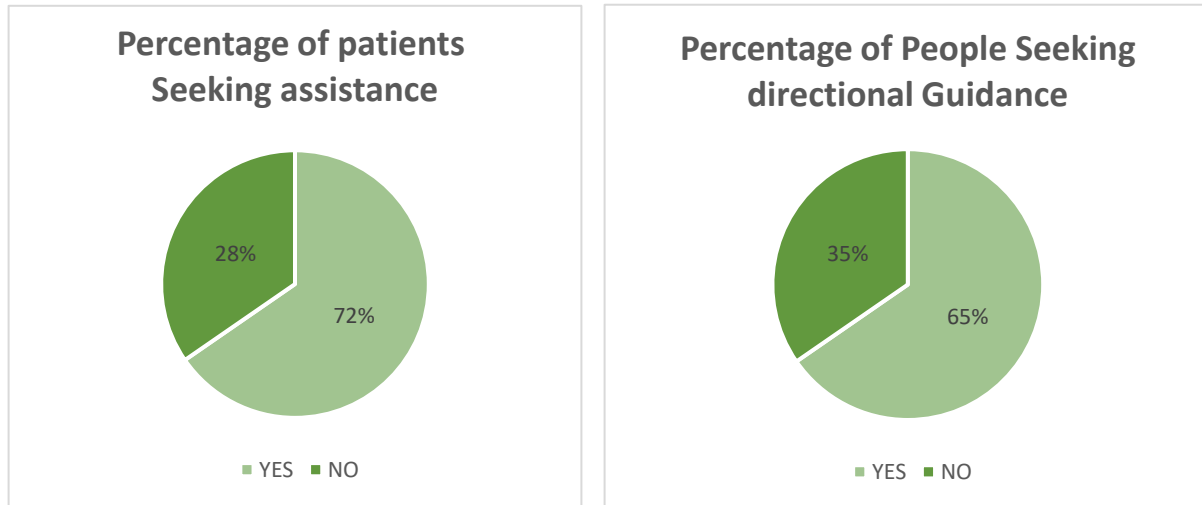


The above graph shows the time taken in minor OT. Average time taken in minor OT is 2 hours 25 minutes and 37 seconds. Minimum time taken in minor OT is of 59 minutes. However, out of 104 patients only 7 patients visited the minor OT, still the process time of this department is very long. Maximum time taken in this process is of 5 hours 7 minutes. Possible reason behind this is mostly unavailability of doctors or patients were not exactly scheduled according to the timings of the doctors.



The graph shows the patients load in different departments after consultation, the maximum load is in the imaging services that is 30.9% this means out of 43 patients (who availed the other services of the hospital after consultation) 17 patients visits imaging services followed by pathology.

CHALLENGES FACED BY PATIENT



Above graphs shows the challenges phased by the patients after entering the hospital the graph at the left shows that out of the sample size of 104, 72% patients require assistance whether it is for wheelchair or stretcher. Sometimes they got assistance, but some patient didn't as there are shortage of manpower and wheelchairs and 65% of patients needed the directional assistance, which shows that the signages in the hospital are not proper or they are not easy to understand.

RADIOLOGY DEPARTMENT

The department of radiology at RGC and RC is a well-equipped department with state-of-the-art technology which compares with the best in the world. It is one of the busiest departments at RGC and RC with 225 to 250 investigations performed each day which includes CT scans, X rays, MRI, USG, Mammography etc.

Floor wise distribution of Department of Radiology at RGCIRC

GROUND FLOOR

- CT scan
- CT guided biopsy
- CT guided FNAC
- X rays

FIRST FLOOR

- USG
- Intervention Radiology

SECOND FLOOR

- MRI

Department of Radiology has: -

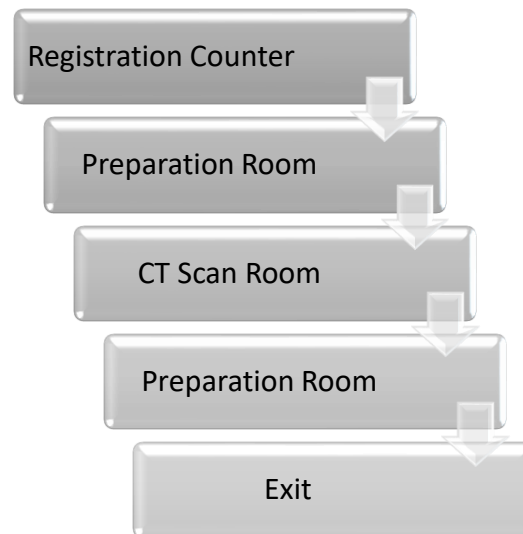
- 1 CT scan
- 1 MRI unit
- 2 functional USG unit
- 1 portable USG unit
- 2 portable Xray unit
- 1 mammography unit
- 1 Fluoroscopic unit
- Dual energy X-ray absorptiometry (DEXA) unit.

Using a convenient sampling technique, a total of 112 patients were selected for the time motion study. Secondary data was collected for the purpose of analysis.

Process	No. of cases
CT scan	24
Mammography	5
X ray	19
USG	33
MRI	31
Total	112

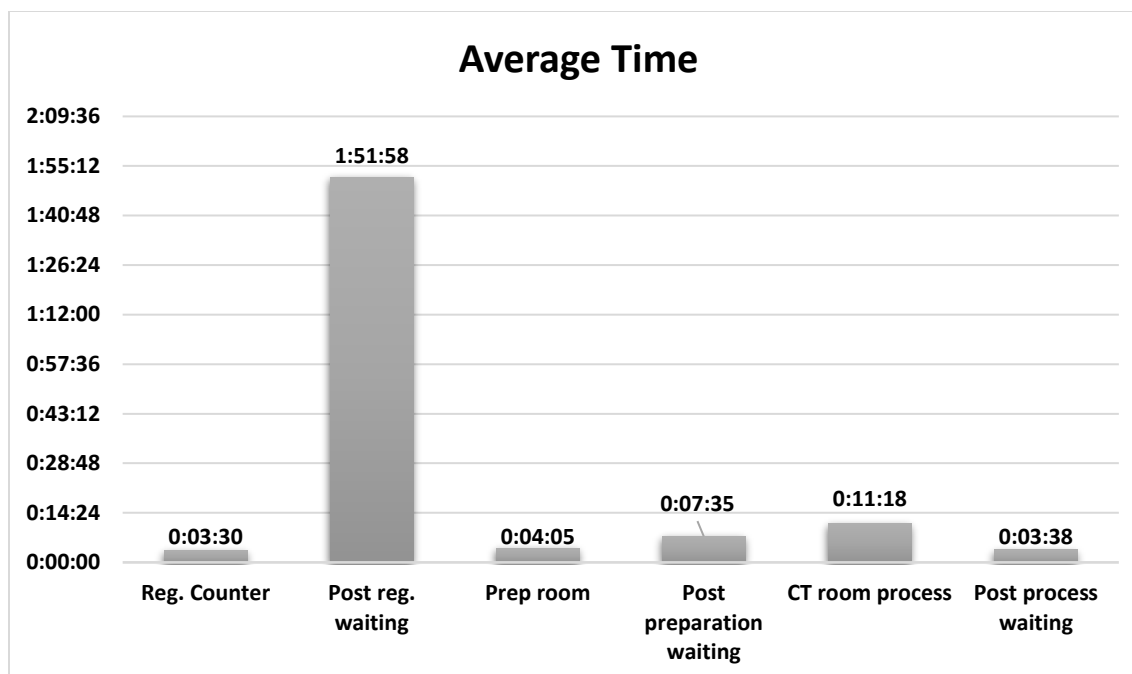
1.COMPUTED TOMOGRAPHY SCAN

PROCESS FLOW OF CT SCAN:



AVERAGE TIME TAKEN AT EACH STEP OF CT SCAN

Processes	Average Time(hh:mm:ss)
Reg. Counter	0:03:30
Post reg. waiting	1:51:58
Prep room	0:04:05
Post preparation waiting	0:07:35
CT room process	0:11:18
Post process waiting	0:03:38
Total TAT	2:22:04



The above graph shows the average time taken in each step of CT Scan process. Possible reason for long waiting time is improper scheduling of tedious processes such as CT and CT guided biopsy. Patient does not come empty stomach as they are not pre informed about that and hence has to wait for long hours. Even if patient came with appointment and empty stomach just because of unscheduled processes they made to wait for the same. Average time taken to take a scan is of 11 minutes 18 seconds and for that he/she has to wait for an average time of 1 hour 51 minutes and 58 seconds.

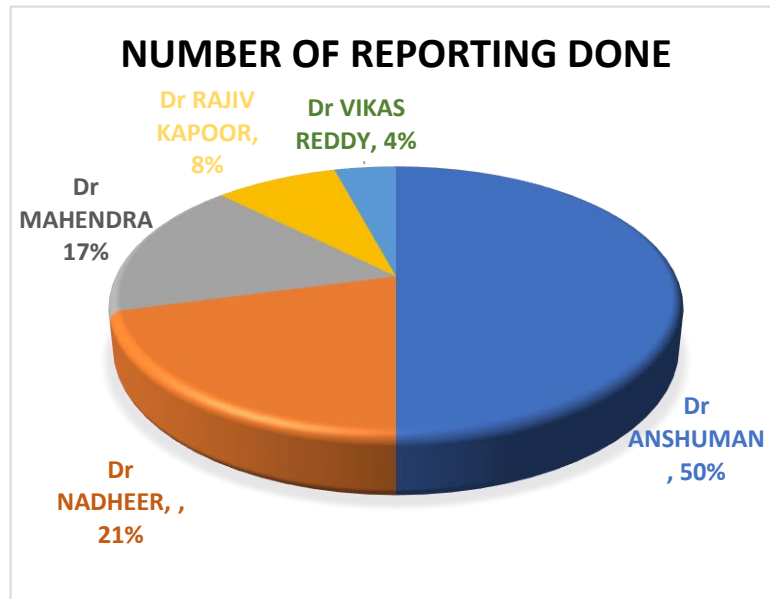
Reporting of CT scan

Reporting of CT scan is divided into two steps that is level 1 and level 2. Level one means the initial reading of the scan which is done by the junior radiologists and level two is the next step that is final validation of the report made by the junior radiologists which is done by the seniors.

Level One Reporting (Initial Reading)

Radiologist	NUMBER OF REPORTING DONE
Dr. ANSHUMAN(JR)	12
Dr. NADHEER(JR)	5
Dr. MAHENDRA(SR)	4

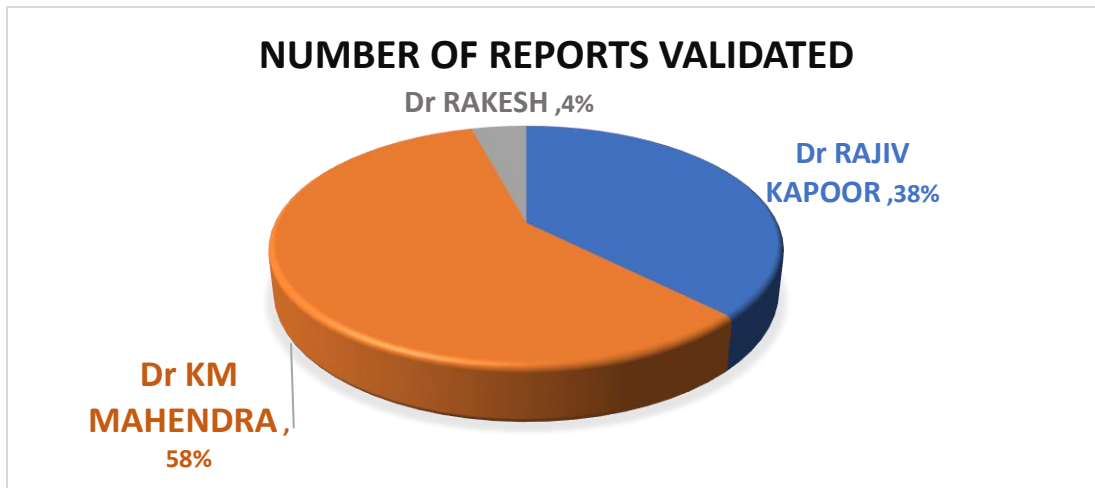
Dr. RAJIV KAPOOR(SR)	2
Dr. VIKAS REDDY(JR)	1



- The above graph shows the number of level 1 reporting done by the radiologists in a day. Average time taken in initial reading of a single CT scan is around 20 to 40 minutes. Although time taken in reporting is case specific and hence can take shorter or longer than the range mentioned. As you can see that 75% of the cases are reported by just 3 junior radiologists and 25% of the cases are reported by senior radiologist clearly indicating lack of junior radiologists to report the investigations.

Level 2 Reporting (Final validation of CT scans)

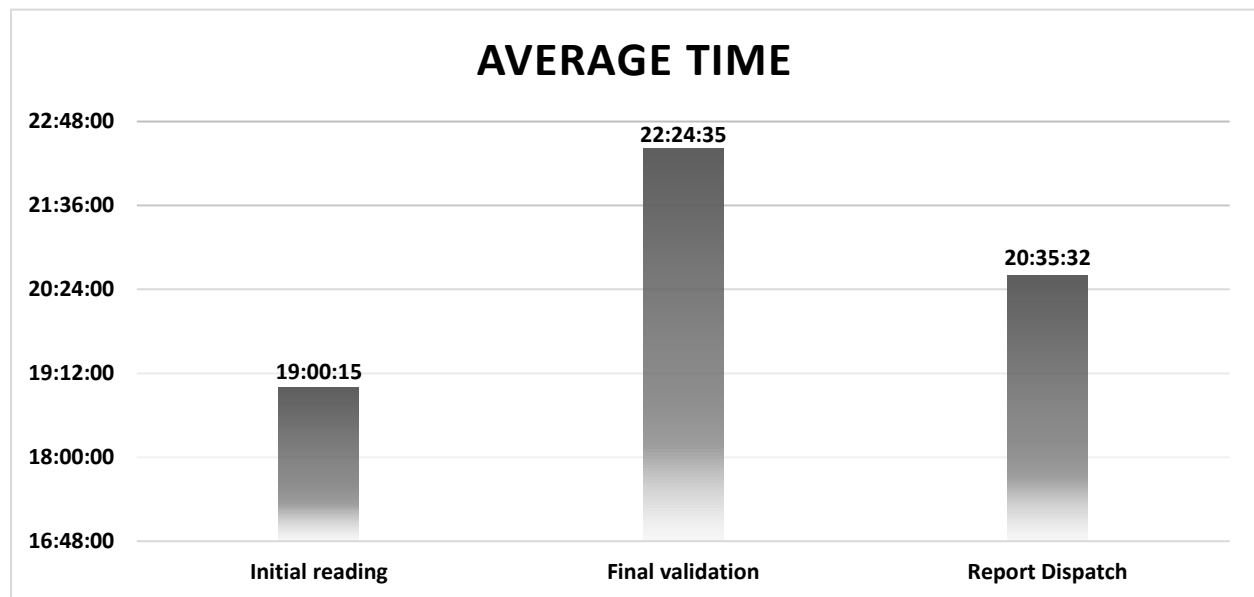
RADIOLOGIST	NUMBER OF REPORTS VALIDATED
Dr RAJIV KAPOOR	9
Dr KM MAHENDRA	14
Dr RAKESH	1



- Above graph shows the number of level2 reporting done in a day. As graph can clearly shows that 58% of cases was validated by a single radiologist indicating a need of effective utilization of manpower. Time taken to validate an Initially read CT scan is 10 min to 35 min. Validation of approved reports are case specific and hence can take shorter or longer than the range mentioned.

Process Name	Average Time (hh:mm:ss)
Initial reading (Level 1)	19:00:15 (Minimum 1:39 to Max.28:27)
Final validation (Level 2)	22:24:35 (Min.7:20 to Max. 44:17)
Report Dispatch	20:35:32 (Min. 2:32 to Max. 45:02)

Average time taken in reporting and dispatch of CT scan



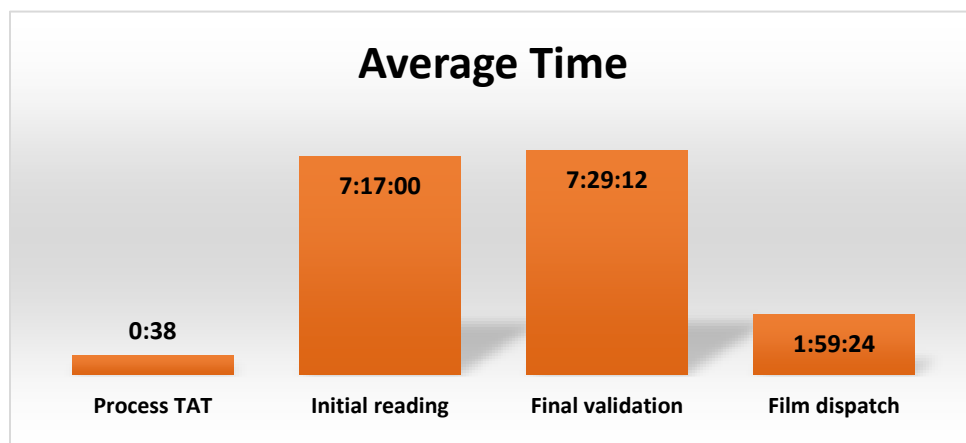
This graph shows the average time taken in reporting of a CT scan and in dispatch of a scan. Average time taken between Initial reading and final Validation of CT scan is 3 hours 25 min.

2.MAMMOGRAPHY SCAN

PROCESS FLOW OF MAMMOGRAPHY:



PROCESSES	AVERAGE TIME (hh:mm:ss)
Reg. Counter	0:06:00
Waiting	0:23:36
Process	0:05:24
Waiting	0:02
TAT	0:38:00
Initial reading	7:17:00
Final validation	7:29:12
Film dispatch	1:59:24

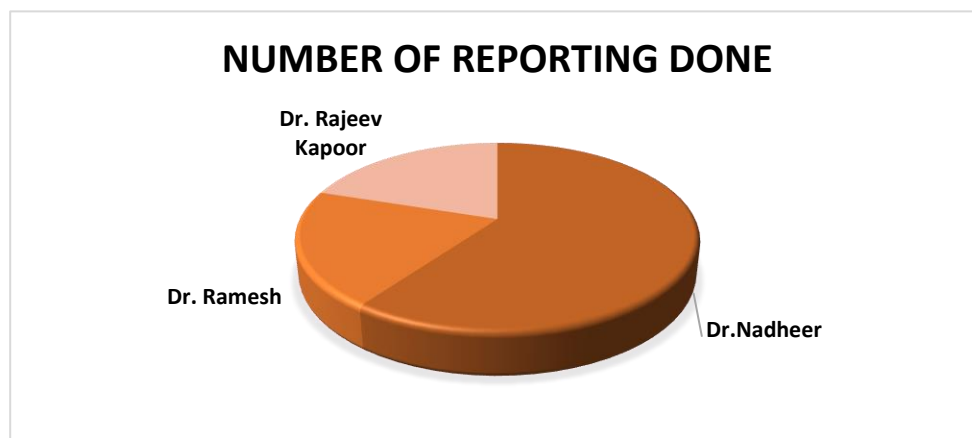


Above graph shows the average time taken in the process of Mammography. Here we can clearly see that the process is very short and less time consuming but most of the time taken is in the process of reporting the scan.

Reporting of Mammogram

Level 1 (Initial reading)

Radiologist	Number of reporting done
Dr. Nadheer (JR)	3
Dr. Ramesh (SR)	1
Dr. Rajeev Kapoor (SR)	1



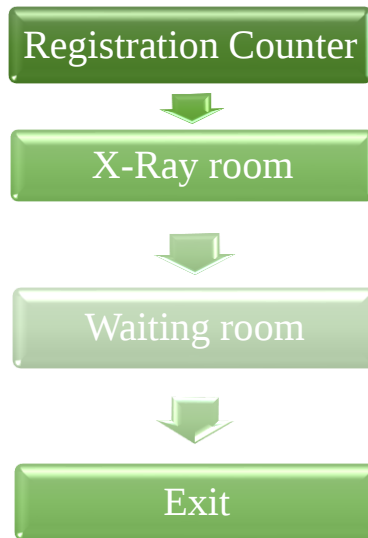
Out of all 5 cases 40% of the cases reported (level1) by senior radiologist and 60% are reported (level 1) by a single junior radiologist.

In Level 2 (Final validation) of all 5 cases done by Dr Rajeev Kapoor.

Time taken for Initial reading of a single mammography film is approximately 10min to 15min. Time taken for validation of a single mammography film is approximately 5min to 10min.

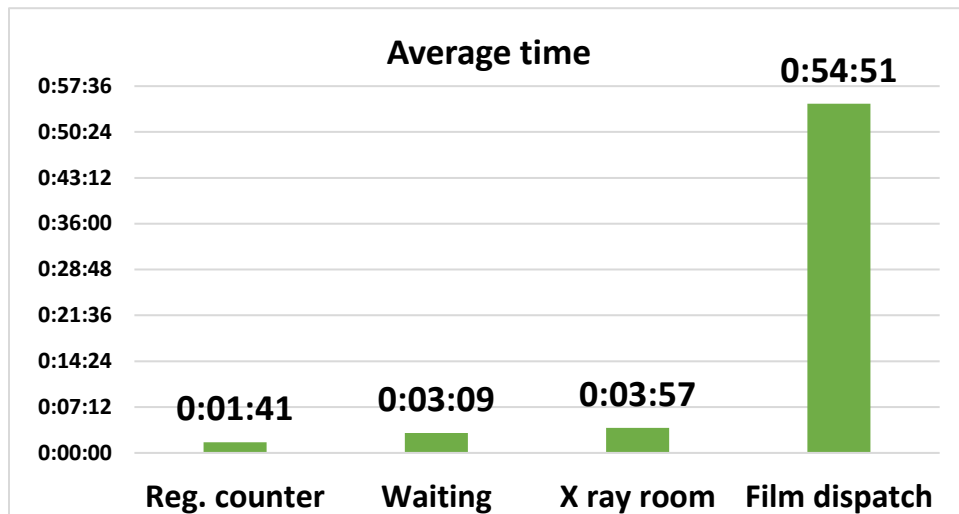
3.X-RAY

PROCESS FLOW OF X-RAY



AVERAGE TIME TAKEN AT EACH STEP OF X-RAY

Processes	Average time
Reg. counter	0:01:41
Waiting	0:03:09
X ray room	0:03:57
Film dispatch	0:54:51
TAT	1:03:38



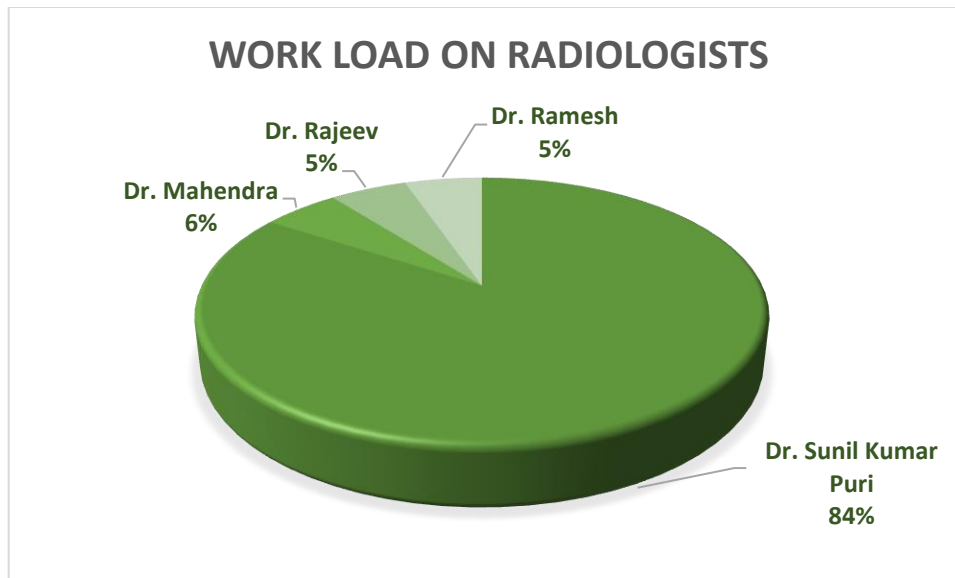
- Above graph shows the average time taken in the process of x-ray from the registration counter till the dispatch of film. The maximum time taken is in the dispatch of X-Ray film. Average time taken between process and dispatch of Xray film is 54 min indicating a flaw in dispatch of X ray films and requirement to decentralize the dispatch counter.

Reporting of X Ray films

Radiologist	No. of Xray Reported
Dr. Sunil Kumar Puri	16
Dr. Mahendra	1
Dr. Rajeev	1
Dr. Ramesh	1
Total	19

In X-ray Level 1 (Initial reading) and Level 2 (Final validation) are done at the same time. There is no separate process for reading and validation of the x-ray film. Time taken to validate a single X ray is 5min to 7min.

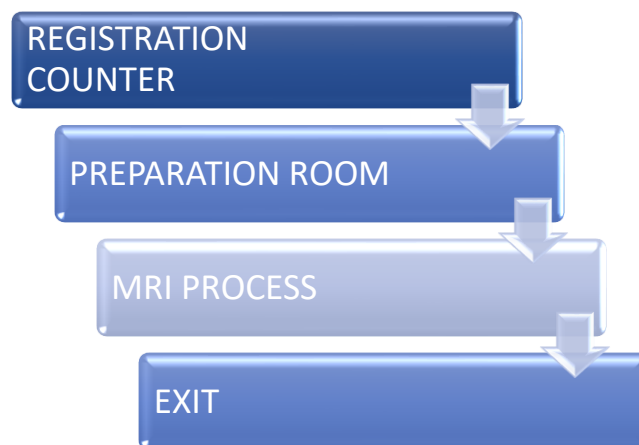
Average time taken to validate X ray film after the process of an X ray is done is 2 hours.



This graph shows the load on the radiologists we can clearly see the 84% of the cases are reported and validated by a single senior radiologist. Validation of X ray is a case specific process hence it can take longer or shorter than the above-mentioned range.

4.MAGNETIC RESONANCE IMAGING (MRI)

PROCESS FLOW OF MRI

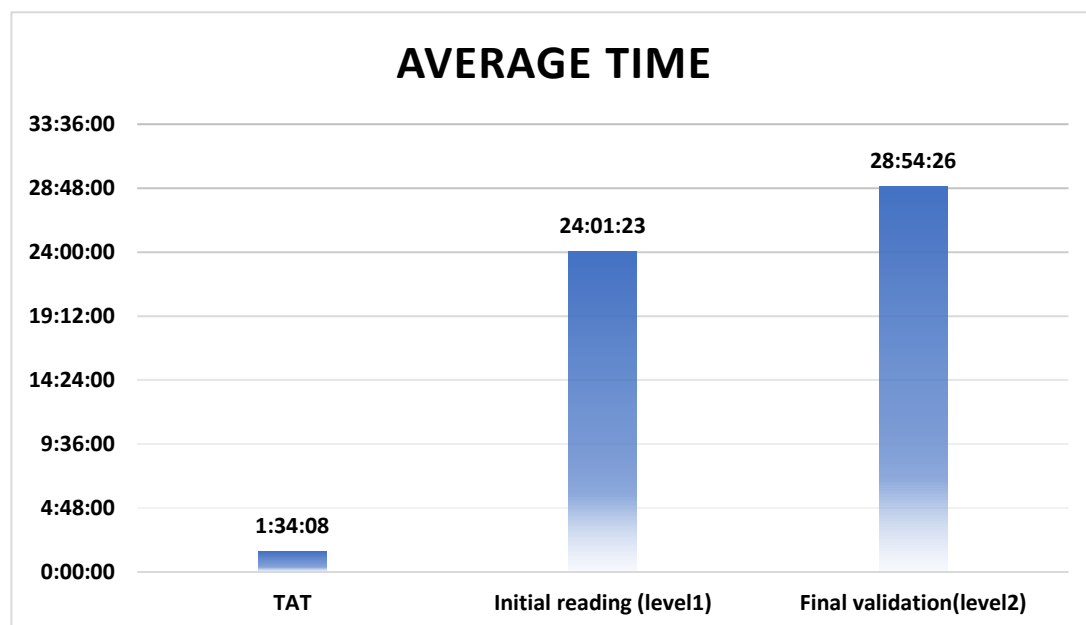


AVERAGE TIME TAKEN AT EACH STEP OF MRI

Processes	Average time
Waiting time	00:31:04
Process duration	01:03:04
TAT	1:34:08
Initial reading (level 1)	24:01:23
Final Validation(level2)	28:54:23

In this table we explained the average time taken in the process of MRI. MRIs are done by the appointment system but still patient has to wait for 31 minutes on an average and this delay is because there are some IPD patients which are taken in between of the appointed patients. After entering the MRI room, the whole process takes around 1 hour 3 minutes.

AVERAGE TIME TAKEN IN PROCESS AND REPORTING

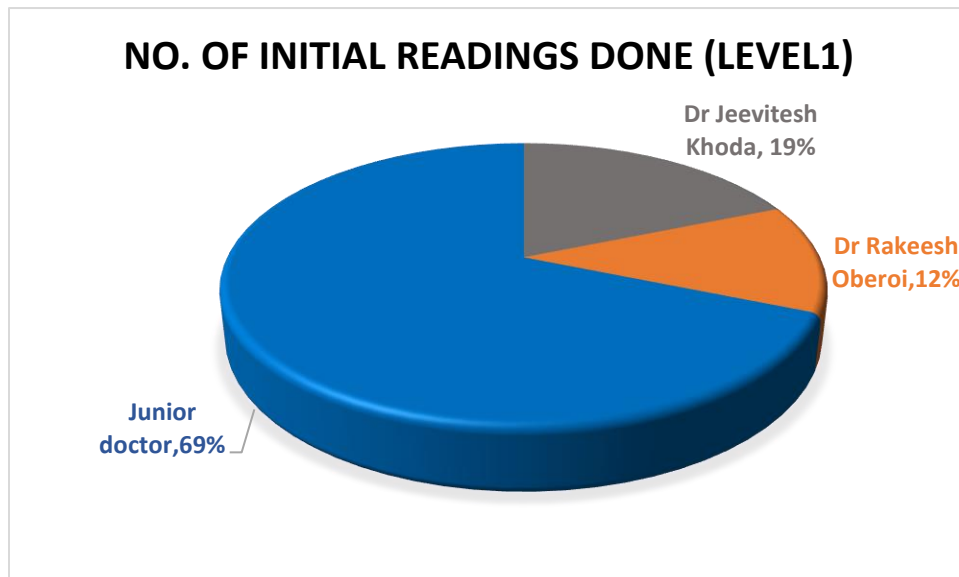


Above graph shows average time taken in the process MRI and it takes around 1 hour 34

minutes and 8 seconds and the average time taken in initial reading (Level 1) of a single MRI scan is around 24 hours. For level 2 that is final validation it takes around 28 hours 54 minutes and 26 seconds. Time taken between Initial reading (level1) and validation(level2) is 4-hour 53min. Average time taken for validation of an MRI after the process is done is more than 24 hours indicating a slight delay in validation of reports.

WORKLOAD ON RADIOLOGISTS IN LEVEL 1 REPORTING

Radiologist	No. of Initial readings (level1)
Dr. Jeevitesh Khoda (SR)	6
Dr. Rakesh Oberoi (SR)	4
Junior Doctor	22

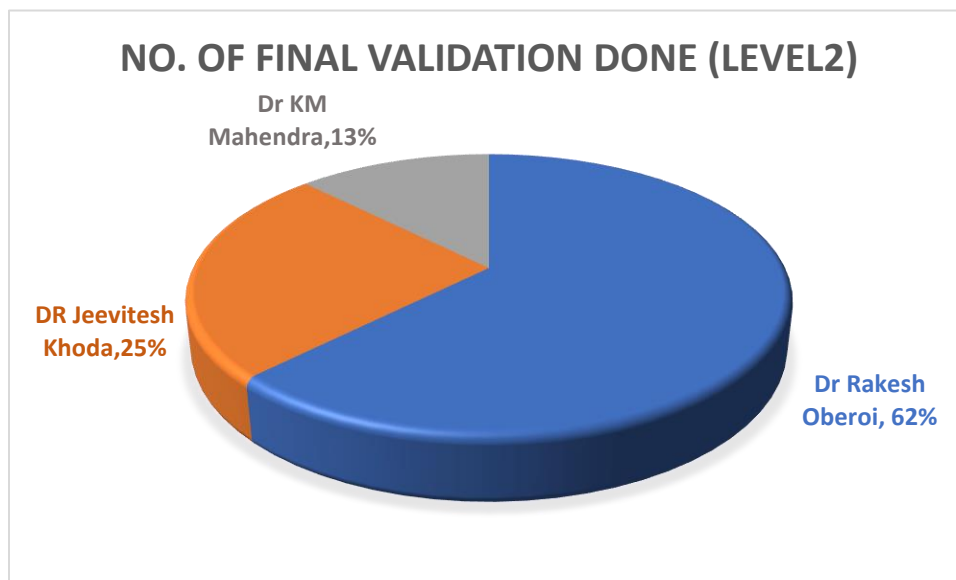


This graph shows that 31% of the reports are directly reported(level1) by senior radiologists. Possible reason- only 2 juniors are posted in dept, which are less as compared to the patient flow. Time taken for initial reading of a single MRI is 25min to 65min.

WORKLOAD ON RADIOLOGISTS IN LEVEL2

Radiologist	No. of final validation(level2)
Dr. Rakesh Oberoi	20
Dr. Jeevitesh Khoda	8
Dr. K.M. Mahendra	4

The given below graph shows that Dr. Rakesh Oberoi has done 62% cases of the MRI and he is the senior radiologist in department but due to high patient footfall, cases are diverted to other senior radiologists also. So, rest of the cases are validated by the senior radiologists of the other department. Time taken to validate a single MRI is around 5min to 15min.



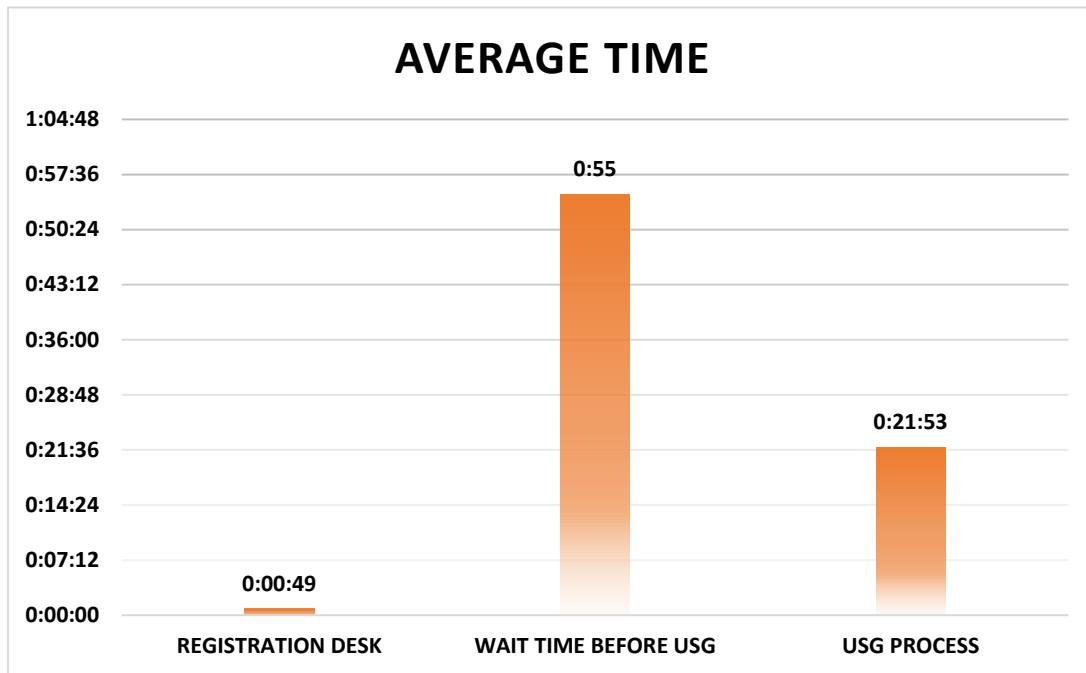
5. ULTRA SONOGRAPHY

PROCESS FLOW OF USG



AVERAGE TIME TAKEN IN THE PROCESS OF USG AND REPORTING

PROCESSES	AVERAGE TIME
Registration Desk	0:00:49
Waiting time before USG	0:55
USG Process	0:21:53
Waiting time after USG	0:05:35
Validation of USG	8:45:27
TAT	1:24:38



This graph shows the average time taken in the process of USG. Long waiting time prior to the process of USG is observed which is of 55 minutes, probable reason for this could be:- Shortage of radiologist to perform the process of USG (only 1 radiologist is seen posted) or Patient foot fall is more. Total turnaround time of USG process is of 1 hour 24 minutes and 38 seconds. And the time taken for the validation of a report is 8 hours 45 minutes and 27 seconds.

Reporting of USG

Level 1 or initial reading of all 33 cases of USG were done by a single junior radiologist.

Level 2 validation of USG

RADIOLOGIST	NUMBER
Dr. RAMESH	32
Dr. VIKAS	1

- It is observed that all USG cases are read initially by a single radiologist and 93% of the cases are validated by a single senior radiologist indicating a shortage of radiologist. Time taken for initial reading of a single USG is 20 to 35 min. Time taken to validate a USG is 10 to 20 min.

- ***(reporting's done are entirely case specific and hence it could take longer or shorter than mentioned range.)**

CHALLENGES IN OPD:

HOSPITAL AMBIENCE

Sanitization protocol is not being followed at the entrance appropriately.

HELP DESK

- Help desk not visible
- Lack of manpower at the help desk- There are only 2 people at the help desk which are not sufficient when the patient load is more.

REGISTRATION AREA

- Registration process is time consuming & the patients are made to wait at the OPD waiting area & then called once the file is ready,
- The scanning process of documents is slow & at times the IT service crashes due to heavy load.
- There is no provision for cost estimation for patients prior to treatment
- Patients find difficulty in reaching to referred OPDs due to inadequate signages & less manpower for guidance (GDA staff)

SERVICES

- Inappropriate staff training
- Staff at the counter are not aware of the Portal (PARAS) & App (RGCI-RC CARE APP)
- The staff is not empathetic towards the patient as they are meant to be specially with cancer patients

OPD AREA

- Display for token number isn't working half of the time due to technical issues & staff incompetency
- The system for calling names of the patient for OPD is inaudible in case of high patient load
- Long waiting hours at the OPD for consultation
- Patient is not informed at the earliest regarding the Doctor's absence & are made to wait for long hours & at times the whole day

- As the Doctor in the Cardiology department is on call basis so the waiting time is more for ECG, EBUS & 2D-Echo.

CHALLENGES IN RADIOLOGY:

CT /MAMMOGRAPHY/X-RAY

- Shortage of Junior Radiologists and need for effective utilization of existing radiologist.
- Nursing staff is not dedicated towards the patients
- Staff at the counter aren't following the required behavioral work ethics.
- No proper signages to show the direction for PET-CT.
- Missing reports due to tedious dispatch process.
- There is no list of instructions provided to the patient before coming for the procedure (e.g., fasting).
- Poor scheduling of various process such as biopsy guided CT and routine CT which are taken up in between the lengthy procedures.

MRI

- Shortage of radiologists for reporting of MRI.
- Delayed reporting's of MRI.
- Usage of regional languages by the technician a matter of discomfort for patient.

USG

- Doctors are overloaded with work and hence are seen doing over time.
- Long waiting time due to high patient load.
- Report collection time of 24hrs is too long for USG as many other diagnostic centers provide the USG report within 30 min.

OUR EXPERIENCE AND OBSERVATIONS

- The staff on the ground floor is not patient friendly and at times seen arguing with the patients.
- Nonprofessional behavior of the staff at registration counter on the ground floor.
- Patient made to wait long hours without proper information especially with respect to dispatch of x rays.

- There is no TO DO list or instructions provided to the patient before the procedure.
- Patients who need to undergo routine CT are made to wait long hours and are taken up in between the lengthy processes.
- Staff is seen communicating in regional language which at times could be disturbing to the patient.
- Doctors are seen multitasking between reporting, clinical processes such as biopsy and many other tasks.
- A few doctors are posted in Niti Bagh campus which further overloads the existing doctors.

CHAPTER 5: CONCLUSION

- In this study our objective was to find out the turn-around-time for the various processes of OPD & Radiology department and the challenges faced by the patients during the processes.
- By the end of the study, we concluded that in OPD maximum waiting time calculated is for Consultation (**0:52:20**) & minimum is at the OPD counter (00:11:42) which are common for all the patients.
- After consultation, once the patient is referred to their respective department, the maximum waiting time observed is for PAC which is (1hr:54mins:40secs). As out of 104 patients only 7 patients visited this department, so this is the Outlier according to the study.
- In Radiology department we concluded that during the process when patient is in the hospital the maximum time taken is in the process of waiting which is 1 hour 51 minutes 58 seconds and 55 minutes for CT scan and USG respectively. We also found out that maximum time is taken in the process of reporting of scans by the doctor which clearly shows the shortage of radiologists or lack of effective utilization of manpower.

RECCOMENDATIONS

- **Signages:** Signages should be incorporated such that they are easily understood & clearly visible
- **Mapping:** The mapping system which already exist needs to be simplified and implemented by the ground staff.
- **Temperature:** at each floor should be modulated accordingly keeping in mind the patient's condition.

- **Staff Training:** More emphasis should be given on staff training for better understanding of Hospital Portal and App system and for improvement of their behavior towards the patients.
- **Manpower:** Enhancement of manpower for patient's navigation and enquiry.
- **IT:** Processes such as registration should be done in online mode as well to reduce patient waiting time.
- **Ancillary Services:** There should be a separate counter from where patient can avail wheelchair services.
- Proper drinking water & sitting facilities should be there in front of the registration counter.
- **Others:** Cases of fall had been observed on the escalators on the ground floor hence proper signages for other options such as elevator and stairs should be incorporated.
- Segregation of hours during the day for appointment patients and walk-in patients for consultation
- Cost estimation should be provided to the patients post consultation.
- Strict rules and regulations on number of attendants accompanying the patients to reduce overcrowding hence improving the general aura of the hospital.
- Provision of availing sim card facility should be provided to international patients.
- Recruitment of radiologist to reduce workload.
- Decentralization of dispatch counter is required.
- There should be a separate missing report desk for the convenience of patients.
- Staff should be trained well to improve on behavioral work ethics.
- Drinking water should be visible to everyone as it is placed on the backside of the waiting area.
- There should be a proper signage for PETCT which is visible to everyone.

CHAPTER 6: REFERENCES

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