

Turnaround Time for Out Patient & Radiology Department and
Associated Factors: A Descriptive study at Rajiv Gandhi Cancer
Institute and Research Centre, Rohini, New Delhi

Dissertation Submitted to



The IIHMR University, Jaipur, Rajasthan

For the partial fulfilment for the award of the degree of

Master of Business Administration (MBA)

in

Hospital and Health Management

By

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Under the Supervision and Guidance of

Dr Jagajeet Prasad Singh

Professor

TO WHOMSOEVER IT MAY CONCERN

I hereby declare that this dissertation titled, “Turnaround Time for Out Patient & Radiology Department and Associated Factors: A Descriptive study at Rajiv Gandhi Cancer Institute and Research Centre, Rohini, New Delhi” is the Bonafede record of my original research work. I declare 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 Information derived from the published or unpublished work of others has been duly acknowledged I the text.

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CERTIFICATE

This is to certify that Mr. Ayan Adhikary in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR university, Jaipur has successfully completed his internship at the Rajiv Gandhi Cancer Institute and Research Centre during April 5, 2022 to June 21, 2022.

Place:

Preceptor/Head of the Organisation

Date:

Name of the Organisation



Rajiv Gandhi Cancer Institute
and Research Centre

HR/22

20/06/2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Ayan Adhikary**, from IIHMR University-Jaipur, has undergone internship from **6th April 2022 to 20th June 2022** on a project to study and measure the Patient Satisfaction in terms of 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. During the above period, he was engaged in data collection & data analysis to study the patient satisfaction, finding the gaps, suggesting the measures to fill the gaps and improve the patient services in the Institute.

During the above period, his performance was good.

We wish him all the best for his future endeavor.

Rekha Sharma
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CERTIFICATE

This is to certify that Mr. Ayan Adhikary working on the research naming “Turnaround Time for Out Patient & Radiology Department and Associated Factors: A Descriptive study at Rajiv Gandhi Cancer Institute and Research Centre, Rohini, New Delhi” in partial fulfilment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and his/her approach to the research study has been sincere, scientific and analytical.

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ABSTRACT

Background:

Turnaround time in radiology department is defined as from the time of entry of patient into the department, preparing patients and done the process to reporting the finding. Since it facilitates more effective patient flows, the turnaround time for elective care has long been seen as a critical health issue in many healthcare systems. It plays a key role in determining the level of hospital service quality. More than knowledge or expertise, it is an observable part of practise that patients will use to assess medical professionals.

Objectives

- 1) To assess the average time taken at each step in OPD (time motion study)
- 2) To assess the average time taken at each step in Radiology Department (Time motion study)
- 3) To perform the gap analysis of both the departments to know the factors associated with Turnaround time

METHODOLOGY-

It was Observational cross sectional descriptive study. The study was conducted at out-patient department and radiology department of Rajiv Gandhi cancer institute, new Delhi . Sample Size-100 samples selected randomly during the study period. The duration of study was 2 months. Inclusion criteria- person who have visited the Radiology department & OPD either for consultation, follow-ups etc. Exclusion **criteria-** persons visiting other Departments of the hospital except for the concerned departments.

Analysis- Quantitative variable was analyzed using mean and standard deviation. Qualitative variable was analyzed using frequency, percentage and appropriate graphs was used. Data was analyzed using MS Excel

Results-

Radiology department TAT, CT scan- total TAT 2hrs 22min. Average time taken between approval to validation of CT scan is 3 hrs.25min. Mammography-TAT-0.38 min, X-RAY -TAT-1hrs 03min 38 sec. Average time taken between process and

dispatched of x-ray films is 54 min. MRI-TAT-1hrs 34 min08 sec. Time taken between approval and validation is 4 hours 53 minutes.USG-TAT-1:24:34. OPD total TAT is 3hrs 1 min 6 sec

Conclusion- In this study our objective is to find out the turn-around-time for the various processes of Radiology department and out-patient department & the challenges faced by the patients during the processes. By the end of the study, it is concluded that maximum waiting time calculated was for Consultation(36mins:45secs) & minimum was at the OPD(2mins:49secs) which are common for all the patients. After consultation, once the patient is referred to their respective department, the maximum waiting time observed was for PAC(1hr:54mins:40secs). As fewer number of patients visited this department comparatively, so this is the Outlier according to the study. In radiology department average time taken between report approval to validation and total TAT are common for all the patients.

To increase TAT, policies should be created, put into place, and audits should be performed on a regular basis. These actions will not only increase patient satisfaction but also shorten hospital stays for patients and speed up the process of releasing them from the facility.

Key words: Turnaround Time, Out Patient Department, Magnetic resonance imaging, Ultrasound.

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Sincerely,

Ayan Adhikary

Project Co-ordinator

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Introduction

Turnaround time in radiology department is defined as from the time of entry of patient into the department, preparing patients and done the process to reporting the finding. Since it facilitates more effective patient flows, the turnaround time for elective care has long been seen as a critical health issue in many healthcare systems [1][2]. It plays a key role in determining the level of hospital service quality. More than knowledge or expertise, it is an observable part of practise that patients will use to assess medical professionals. 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.[8][7] 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.

Rationale

Plethora of people come in the hospital for consultation, diagnosis and treatment purposes. The hospital should have an appropriate time motion variable in order to service each and every patient properly. A one of its kind hospitals is present at Rohini, New Delhi that is Rajiv Gandhi Cancer Institute and Research Centre where n number of patients with multiple problems related to Oncology come at a daily basis and the

hospital should be providing maximum of its potential to deliver its services at the fastest rate so that patient's ease can be maintained. Thus, this research is conducted to analyze the Turnaround time of the OPD and Radiology department of the hospital and to find all the factors that are causing delay in providing services to the clients and also to find the challenges that respective departments are facing in order to find the justified ways/measures to overcome problem of delays.

Chapter 2

Literature Review

Title- Turnaround Time (TAT): Difference in Concept for Laboratory and Clinician Year- 2012 Authors- Hara P. Pati, & Gurmeet Singh	TAT is a crucial criterion for laboratory and the hospital when evaluating the laboratory service, according to the study's findings for all test kinds or settings, a single definition of TAT is Insufficient	
Title- Laboratory Turnaround time Year- 2007 Authors- Robert C. Hawkins	The Study analyzed the challenges faced by a famous laboratory and researcher tried to find all the factors responsible for the delay in the flow process and gave measures and ways to improve the efficiency of the laboratory.	
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.	

Title- Evaluation of Stat and routine Turnaround Times as a component of Laboratory Quality Year- 01 March 1989 Authors- Lee H. Hilborne, MD Robert K, Oye, MD Joseph E MCardie, MD Jeff A. Repniski, MS Denis	In the study the authors evaluated stat and routine turnaround times for 42414 requests on 24 clinical analytes over a 14 days interval with the use of a personal computer. The study concluded that the median turnaround time is 1.7 times faster for stat than for routine tests.	
Title- Physician satisfaction and emergency department laboratory test turnaround time: observations based on college of American Pathologists Q-Probes studies. Year- 2001 Authors- SJ Steindel, PJ Howanitz	The study was conducted to determine the length of time for the components of the emergency department turnaround in 1998. Method was use to design the forms and then filled the form and then analysis of the TAT was done.	

Research Question

- What is the Turnaround time for Out Patient and Radiology Department of Rajiv Gandhi cancer institute & research centre?
- What are the factors associated with Turnaround time?

Objectives

- 1) To assess the average time taken at each steps in OPD (time motion study)
- 2) To assess the average time taken at each steps in Radiology Department (Time motion study)
- 3) To perform the gap analysis of both the departments to know the factors associated with Turnaround time

Chapter 3

Materials and Methods

Study design- Observational cross sectional descriptive study

Setting Area- Radiology Department at Rajiv Gandhi cancer institute & research center, Rohini, New Delhi

Study Population Inclusion criteria- person who have visited the Radiology department & OPD either for consultation, follow-ups etc.

Exclusion criteria- persons visiting other Departments of the hospital except for the concerned departments.

Study tools- Check-list and MS-excel

Duration of Study- from 5th April to 21th June

Sample Size-

100 persons who visited Radiology Department of Rajiv Gandhi cancer institute and Research Centre at the time of study.

100 person who visited OPD of Rajiv Gandhi cancer institute & research centre.

Sampling Technique- Systematic Random Sampling

Data Collection Procedure- Check-list

Operational definitions- TAT, Gap Analysis

Data Analysis Plan- Quantitative variable was analyzed using mean and standard deviation. Qualitative variable was analyzed using frequency, percentage and Pie chart and bar graphs were used. Data were analyzed using MS Excel

Ethical Consideration- informed consent from all participants, no unethical question involved and privacy and anonymity of the patients fully maintained.

Implications of Research

To understand the challenges faced by the respective departments of the privileged hospital at Rohini. To find all the factors that are causing delay in the process flow and outcome and giving adequate measures or ways to overcome those delay causing factors.

Chapter 4

Radiology: The study was conducted at radiology department, 100 patient selected randomly during the study period. To find out the reasons of increased Radiology TAT. Various TAT were calculated at various department of radiology.

COMPUTED TOMOGRAPHY SCAN

PROCESS OF CT SCAN-

Registration counter — preparation room — CT room —
preparation room — Exit

Figure 1: Average time taken for the CT scan Process

- The charts shows that average time of various process of CT scan. In registration counter average time for each patient is 3 min 30 sec. post registration waiting average time is 1hrs51 min 58 sec. preparation room average waiting time is 4min5 sec. CT room process for the CT scan average time is 11 min 18 sec. Total TAT of this process is 2hrs 22 min 04 sec.
- Possible reason for long waiting time:- improper scheduling of tedious processes such as CT and CT guided biopsy.
- Patient does not come empty stomach and hence has to wait.
- Time taken to approve a single CT scan is 20min to 40 min.
- 71% of the cases are reported by just 2 junior radiologists.
- 29% of the cases are reported by senior radiologist clearly indicating a lack of radiologists to report the investigations.

*(Reporting's done are case specific and hence can take shorter or longer than the range mentioned)

Table 1: Average time taken in reporting and dispatch of CT scan

Process Name	Average Time
Report Approval (level 1)	19:00:15 (1:39 to 28:27)

- Average time taken between Approval to Validation of CT scan was 3 hours 25 min
- Average time taken in report approval was 19hrs.report validation time was 22hrs24 min 35 sec. Average time of report dispatch was 20hrs35 min 32 sec.

MAMMOGRAPHY SCAN

Table:2 Mammography process TAT

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
Approval	7:17:00
Validation	7:29:12
Film dispatch	1:59:24

Mammography process TAT is 38 min for each patient. Average time for approval the report is 7 hours 17 minutes. Average time for validation of report is 7 hors 29 minutes .

- Time taken for approval of a single mammography film was 10min to 15min.
- Time taken for validation of a single mammography film was 5min to 10min.
- 40% of the cases reported by senior radiologist ad 60% are reported by a single junior radiologist indicating shortage of radiologist.

*(reporting of a mammography film is entirely case specific and hence can take longer or shorter than the given range.)

X-RAY

PROCESS OF XRAY

Registration counter — X RAY room — Waiting area — Exit

Table 3: X-ray process TAT

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

- 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.
- Total TAT for X-Ray process is 1hrs03 min 38 sec

Reporting of X Ray films

Level 1 (approval) and Level 2 (validation) are done at the same time.

- 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 was done in 2 hours.
- 84% of the cases are reported and validated by a single senior radiologist indicating a shortage of staff.

* Validation of X ray was a case specific process hence it can take longer or shorter than the above-mentioned range.

MAGNETIC RESONANCE IMAGING (MRI)

Process of MRI

Registration Counter — Preparation Room — MRI process — Exit

Figure 2: TAT in MRI process

- Time taken between approval (level1) and validation(level2) is 4 hour 53min.

- Average time taken for validation of an MRI after the process is done is clearly more than 24 hours indicating a delay in dispatch of reports.
- 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 to approve a single MRI is 25min to 65min.

*(reporting of MRI are case specific and hence it could take longer or shorter than the mentioned range)

- Time taken to validate a single MRI is 5min to 15min.
- *(reporting of MRI are case specific and hence it could take longer or shorter than the mentioned range)

ULTRA SONOGRAPHY

Process of USG

Registration counter ——— USG room ——— EXIT

Table 4: TAT for USG process

PROCESSES	AVERAGE TIME
Reg.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

Table 4: TAT for USG process

Long waiting time prior to the process of USG is observed , probable reason for this could be:-

- Shortage of radiologist to perform the process of USG(only 1 radiologist is seen posted).
- Average time in registration desk is 49 sec. Total TAT of the USG process is 1hrs24minutes38 sec. Waiting time before USG is 0.55 minutes and USG process time is 21 minutes 53 sec.
- Patient foot fall is more.
- Time taken to approve a USG is 20 to 35 min.
- Time taken to validate a USG is 10 to 20 min.

- Its is observed that all USG cases are approved by a single radiologist and 93% of the cases are validated by a single senior radiologist indicating a shortage of radiologist.

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

Challenges in Radiology

CT /MAMMOGRAPHY/X-RAY

- Shortage of doctors hence the existing radiologists are multi tasking with various processes.
- 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 approval/reporting of MRI.
- Poor appointment scheduling system (no appointments given on Sundays)
- 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 with in 30 min.

OBSERVATION

- 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.

SUGGESTIONS FOR RADIOLOGY

- Recruitment of radiologist to reduce workload.
- Requirement of a medical transcriptionist to help radiologist type the reports.
- Decentralization of dispatch counter is required.
- Sunday should be functional for the convenience of working and for out of station patients.
- 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 at the backside of the waiting area.
- There should be a proper signage for PETCT which is visible to everyone.

OPD(Out Patient Department)

STUDY AREA

The OPD of the "not-for-profit" RGCIRC in Delhi, where this study was conducted, was used. With 500 beds available, the RGCIRC can accommodate more than 100,000 outpatients annually. The institute contains a 21-bed medical ICU, a 51-bed surgical ICU, a separate Thyroid Ward, a separate ward for leukaemia, and a 22-bed autonomous bone marrow transplant unit that is known for being the first to do transplants from unrelated donors, MUD transplants, and stem cell transplants. There are other supportive services available, including various endoscopies (including EBUS and endoscopic ultrasound) and renal replacement therapy.

The outpatient department (OPD) acts as the hospital's front-of-house and first point of contact with patients. Patient satisfaction and the care received in the OPD are indicators of the hospital's ability to deliver high-quality services. Patient discontent is greatly impacted by overcrowding because of the lengthy wait times and short consultations. 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. This investigation lasted for 20 working days. TMS and direct patient engagement were used to collect the data.

PROCESS FLOW

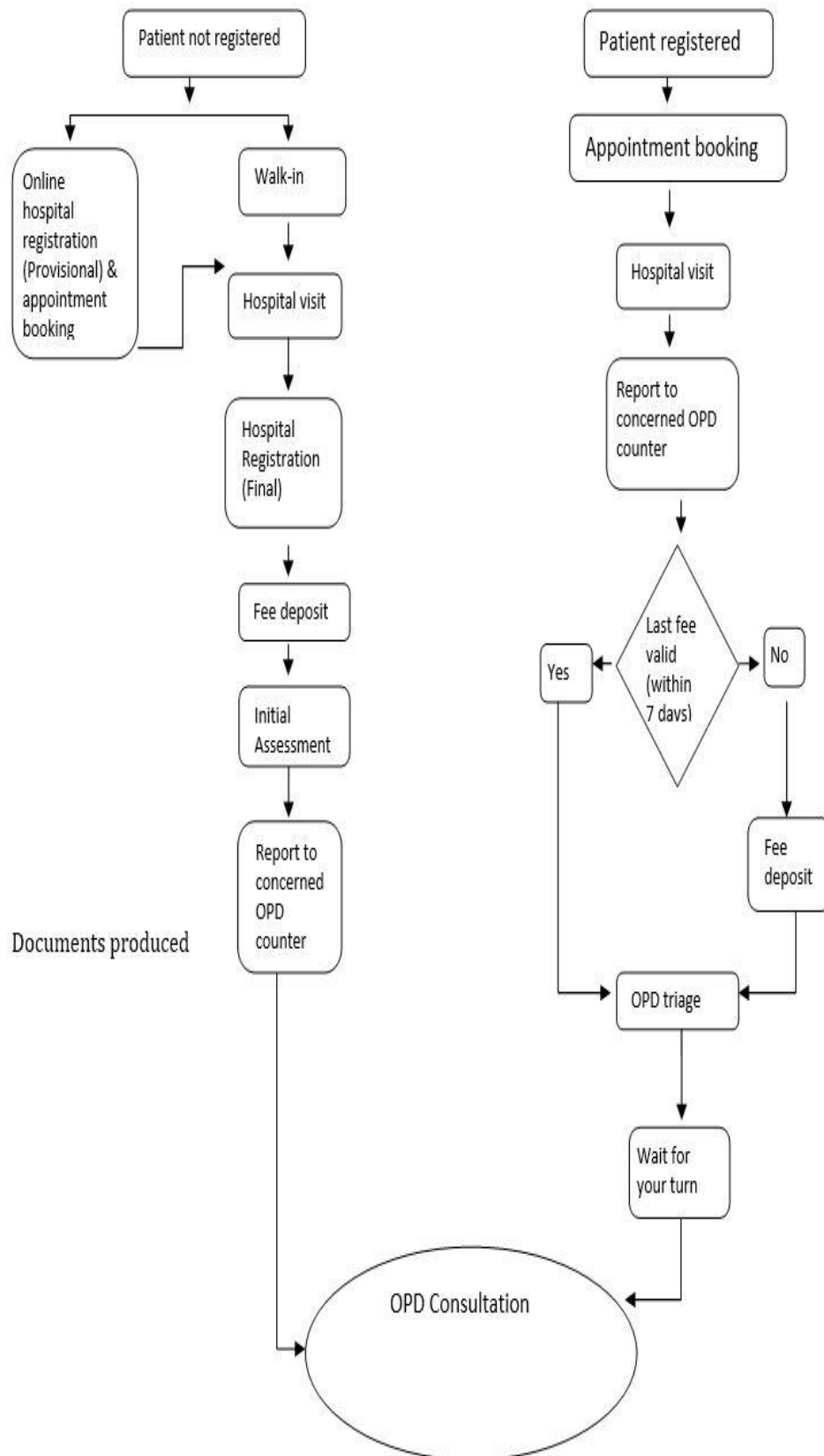


Figure 3: Process flow of OPD

Table 5: Waiting time in OPD

PROCESS	WAITING TIME
REGISTRATION	0:09:39
IAU	0:09:42
OPD COUNTER	0:02:49
CONSULTATION	0:36:45

OPD process was very lengthy. Registration counter waiting time was 9 min 39sec. Internal Assessment Unit (IAU) processing time for each patient was 9 min 42 second. OPD counter waiting time for token was 2 min. Average consultation time was 36min45 sec

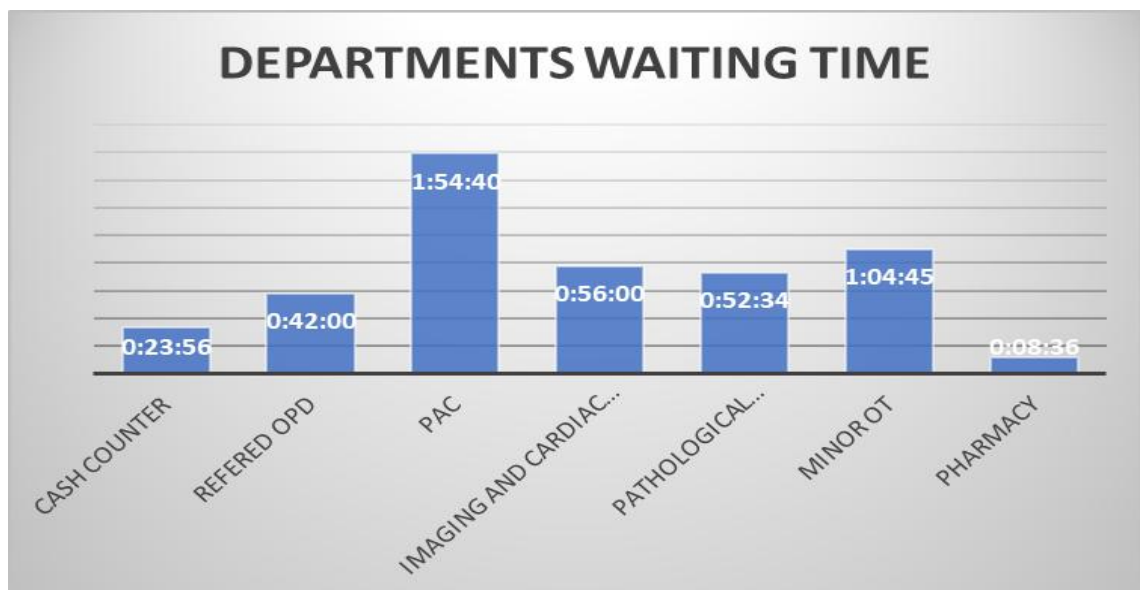


Figure 4: Department wise waiting time(after consultation)

This bar chart shows that department wise average time after consultation. Cash counter Average time is 23min 56 sec. Referred OPD average time is 42min. Imaging and pathological department average time are 56minutes and 52 minutes respectively. Minor OT average time is 1hrs.45 minutes and pharmacy counter average time is 8 min 36 sec.

Figure 10: Turn Around Time of OPD Process

Average Turnaround time was 3hrs:1min:6sec. This graph shows the TAT of the OPD.

Average time in helpdesk was 11min 49 sec. Functional time of registration counter was 12 min. waiting time was 9 min 39 sec. average functional time in IAU was 7min 51 sec and waiting time was 9min 42 sec. consultation Average time was 15 min 35 sec. waiting time for consultation was 36 min 45 sec

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.
- Less number of help desk at the premise

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.

Recommendations for OPD

- Signages should be incorporated such that they are easily understood & clearly visible
- 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.
- More emphasis should be given on staff training for better understanding of Hospital Portal and App system and for improvement of there behavior towards the patients.
- Enhancement of manpower for patient's navigation and enquiry.
- 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.
- Improvement of announcement System.
- Improvement in IT system
- 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.
- Processes such as registration should be done in online mode as well to reduce patient waiting time.
- Strict rules and regulations on number of attendants accompanying the patients to reduce overcrowding hence improving the general aura of the hospital.

- 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.
- Provision of availing sim card facility should be provided to international patients.

CONCLUSION

In this study our objective is to find out the turn-around-time for the various processes of Radiology department and out-patient department & the challenges faced by the patients during the processes. By the end of the study, I concluded that maximum waiting time calculated is for Consultation(36mins:45secs) & minimum is at the OPD(2mins:49secs) 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(1hr:54mins:40secs). As fewer number of patients visited this department comparatively, so this is the Outlier according to the study. In radiology department Average time taken between report approval to validation and total TAT are common for all the patients.

To increase TAT, policies should be created, put into place, and audits should be performed on a regular basis. These actions will not only increase patient satisfaction but also shorten hospital stays for patients and speed up the process of releasing them from the facility.

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