

Process Mapping and Identification of Bottlenecks Leading to Increase in Turnaround Time of Patients in the Outpatients Department

By

Eisha Sangwan

*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

Academic year, 2015-2017



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

Process Mapping and Identification of Bottlenecks Leading to
Increase in Turnaround Time of Patients in the Outpatients
Department

By

Eisha Sangwan

*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

Academic year, 2015-2017

Columbia Asia Hospital, Saltlake, Kolkata



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer, Airport
Jaipur 302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

TO WHOMSOEVER MAY CONCERN

This is to certify that **Dr.Eisha Sangwan** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **Columbia Asia Hospital, Saltlake, Kolkata** from **13 Feb2017** to **13 May2017**.

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(Col).Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur



Dr.(Brig) S.K.Puri
Advisor
The IIHMR University, Jaipur

COLUMBIA ASIA

The certificate is awarded to

Dr. Eisha Sangwan

In recognition of having successfully completed her

Internship in the department "**Operations**"

and has successfully completed her Project on

Process Mapping and identification of bottlenecks leading to increase turnaround time of patients for consultation in the outpatients department of Columbia Asia Hospitals,

Salt lake

From 13 Feb 2017-13 May 2017

Columbia Asia Hospitals, Saltlake, Kolkata

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors.

Training & Development

Zonal Head-Human Resources

THE IIMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled ...

Process Mapping and identification of bottlenecks leading to increase turnaround time of patients for consultation in Outpatients department

and submitted by **Dr.Eisha Sangwan** Enrollment No. 0275 under the supervision of **Brig S.K.Puri.** for award of MBA in Hospital and Health Management of the University carried out during the period from **13 Feb2017 to 13 May2017** .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.

Eisha

Signature

THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that all ethical issues have been considered while collecting data for my dissertation titled **“Process mapping and identification of bottlenecks leading to increase in turnaround time of patients for consultation in outpatients department”**

Eisha

Signature of student

Contents

Sl. no	Topic	Page Number
1	Acknowledgement	5
2	Abbreviations	4
3.	Introduction	6
4	Review Of Literature	7
5	Methodology	10
6	Process flow	14
7	Results and Analysis	18
8	Conclusion	36
9	References	37

List of Figures

S.no	Figure	Page no
1	Process flow for consultation	11
2	Various Time definitions	13
3	TAT for initial nurses assessment	15
4	TAT for consultation	16
5	Total patient wait	17
6	Doctor Reporting delay	18
7	Comparison between registration time, billing time and consultation time(Morning pts.)	19
8	Comparison between registration time, billing time and consultation time(Afternoon pts.)	20
9	Cancelled appointments and reasons	21
10	Suggested v/s average turnaround time	
11	Contribution of each step in total turnaround time	23
12	Causes for increase turnaround time	25

List of abbreviations

S.No.	Abbreviation	Meaning
1.	AAMI	Association for the Advancement of Medical Instrumentation
2.	ABG	Arterial Blood Gas
3.	BBV	Blood Borne Viruses
4.	CABG	Coronary Artery Bypass Graft
5.	CAPEX	Capital Expenditure
6.	CAUTI	Catheters associated urinary tract infections
7.	CDC	Centres for Disease Control and Prevention
8.	CLABSI	Catheter linked associated bloodstream infections
9.	COW	Computer on Wheels
10.	CPRS	Computerized Patient Record System
11.	CSSD	Central Sterile Services Department
12.	CTVS	Cardiac Thoracic Vascular Surgery
13.	GDA	Ground Duty Assistant
14.	HAI's	Hospital Acquired Infections
15.	HIS	Hospital Information System
16.	ICPs	Infection Control Practitioners
17.	IPS	International Patient Services
18.	LAMA	Leave Against Medical Advice
19.	LASA	Look alike Sound alike
20.	MRSA	Methicillin Resistant Staphylococcus aureus
21.	MSSH	Max Super Specialty Hospital
22.	NABH	National Accreditation Board for Hospitals & Healthcare Providers
23.	OPEX	Operational expenditure
24.	PAC	Pre-Operative Assessment Clinic
25.	PPE	Personal Protective Equipment
26.	PPT	Partial Thromboplastin Time
27.	RA	Restricted Antibiotics
28.	RRT	Rapid Response Team
29.	TAT	Turn Around Time

Acknowledgment

The Dissertation at Columbia Asia, Kolkata offered both a learning experience as well as a glimpse into the daily management functions of a renowned private hospital. I was fortunate enough to interact with people, who in their own capacities have encouraged and guided me.

My mentors and guide have helped me to achieve my goal and incorporate motivation into me. My long and extended thank you note would start with thanking few but the most important people. First of all, I would like to thank **Mr. Tufan Ghosh, CEO** for providing me an opportunity to do my Dissertation at Columbia Asia. It is my genuine pleasure to express my very special thanks and gratitude to **Mr. Tanu Tiwari**, General Manager, Training and Development, Columbia Asia Hospital, for granting me the opportunity for completing my dissertation and taking out time to guide me throughout the dissertation period.

I would like to especially thank **Mr. Arindam Banerjee, General Manager, Columbia Asia, Salt lake** for selecting me and trusting my capabilities to prove myself. I would like to thank **Samrat Sanyal, Manager, Operations** for guiding and supporting at every step in my project work as well as taking the pain of describing in detail every minor doubt I had.

I am highly obliged to **Dr. S.D. Gupta (Director, IIHMR)**, and to my mentor, **Dr. (Brig) S.K. Puri** in the institute for crafting my interest in this stream, providing necessary suggestions and guiding me to complete this report.

Finally I Acknowledge my indebtedness to the staff of Columbia Asia Hospital, Kolkata who answered of all my queries and as well as invaluable support and continuous help to the successful completion of my Dissertation.

Dr.Eisha Sangwan

1.INTRODUCTION

The Columbia Asia hospital, Saltlake outpatient clinic is confronted with long waiting times for patients, overtime for doctors and nurses during clinic sessions, and peak workloads for its counter personnel. Research on outpatient clinics shows that waiting times are patients' main dissatisfaction with hospital services (Huang, 1994). According to doctors and personnel, overtime and peak workloads are potential threats for the quality of care and the quality of labor, because they increase stress and time pressure. This case study focuses on understanding the current process flow in the outpatient clinic, analyzing the waiting time, finding out the reasons while trying to propose solutions for the same.

2. RATIONALE

Outpatient clinics are essential services for hospitals. They perform a gatekeeper role and are often a patient's first contact with a hospital. This study will help to understand the process flow, and identify the delays at different touch points of the patient. In order to maximize the utilization of Outpatients department, it is essential to know the process flow and understand the reasons leading to delay and increase in patient waiting time. The study also focuses on identifying of bottlenecks in the current process with appropriate suggestions for improvement.

3. RESEARCH QUESTION

To calculate the waiting time and identify the reasons for increase in turnaround time of patients for consultation in the outpatients department.

4.PROBLEM STATEMENT

A quantitative analysis to study the Turnaround Time of consultation in the Outpatients department of Columbia Asia Hospital, Salt lake, Kolkata.

5. OBJECTIVES

This study was under taken in the outpatients department pertaining to Opd consultation only, with the following objectives:

1. To study the process flow for OPD consultation as it exists
2. To calculate the patient waiting time at different touch points
3. To study the factors influencing the delayed services ,if any
4. To propose probable solutions for the same

6.REVIEW OF LITERATURE

Waiting time is an important determinant of quality services as it is noted that in health care provision ‘delays are expensive, not only in terms of direct costs incurred, but also in terms of the potential costs of decreased patient satisfaction and adverse outcomes’ (Haussmann, 1970).

A)Patient Waiting Time: It’s Impact on Hospital Outpatient Department

A research paper by Dr Sandesh Kumar Sharma and Dr SudhinderSingh Chowhan

Out Patient Department (OPD) is frequently a patient’s first experience with the hospital, improving the efficiencies is paramount to both customer satisfaction and hospital’s bottom line. This study helps to know the unnecessary and delayed movements in the department so as that with this knowledge the management will be able to take adequate measures to

improve the functioning of the department. The Research approach adopted in this study was Descriptive Method. This included collection of data using observational checklist from patients visiting Out Patient department. Collection of Data: Primary Data was collected by Observation method, Interview method and secondary Data from Internet, Articles, Hospital record, other sources.

The sample of size 45 patients was included for the study. Data was mainly collected from the Patients who visited the Hospital OPD or Admitted in the ward through the OPD. The result showed that the waiting time spent by the patients in reception for registration was much less in case of maximum no. of patients compared to lesser no. of patients whose waiting time exceeded more than 30min

B) Collaborative action research to reduce patient wait times: Results in two high-demand public clinics in Western Cape, South Africa

A Research paper by M. Anjali Sastry^{1,2*}, Katelyn N.G. Long^{1,3}, Angela de Sa^{4,5}, Haniem Salie⁴, Stephanie M. Topp^{6,7,8}, Saurabh Sanghvi¹, Lindi van Niekerk⁹

Lengthy waiting times are problematic for patients and healthcare workers alike. In clinics and hospitals across Africa, persistently long wait times have been linked to poor medication compliance, skipped appointments, delayed implementation of clinical programs, and low healthcare worker morale. This paper presents results from collaborative action research projects at two high-demand primary care public health facilities in Cape Town, South Africa. Projects were built around two-week focal interventions undertaken by clinic staff and US-based graduate students in concert with clinic leadership, researchers, and faculty. The method of data collection was drawing on detailed time stamp data for over 2,400 patient visits, and comparing entry-to-exit times before and after focused action research collaborations and examining operational changes along with site specific enabling and constraining factors.

The findings from study was mean wait times were significantly reduced, from 129 to 102 minutes in one clinic's pharmacy and from 275 to 196 minutes in the second clinic. Operational changes sustained over three months after the focal collaboration took the form of procedural improvements, technology adjustments, tailoring of patient visits, and team

capacity-building. Contextual barriers included staff turnover, varying staff participation, mandated software changes, and resource constraints, while enablers included leadership commitment, experience with past improvement collaborations, and advocacy.

C)Determinants of Patient Waiting Time in the General Outpatient Department of a Tertiary Health Institution in North Western Nigeria

A study by MO Oche and H Adamu in 2013

The amount of time a patient waits to be seen is one factor which affects utilization of healthcare services. Patients perceive long waiting times as barrier to actually obtaining services and keeping patients waiting unnecessarily can be a cause of stress for both patient and doctor. This study was aimed at assessing the determinants of patients' waiting time in the general outpatient department (GOPD) of a tertiary health institution in northern Nigeria.

This descriptive cross-sectional study was carried out among new patients attending the GOPD of the Usmanu Danfodiyo University Teaching Hospital, Sokoto, North Western Nigeria. A structured questionnaire was used to elicit information from 100 patients who were recruited into the study using a convenience sampling method. Data collected were entered and analyzed using Statistical Package for Social Sciences version 17; Chi-square test was used to compare differences between proportions with the level of statistical significance set at 5% ($P < 0.05$). The results showed that sixty-one percent (59/96) of the respondents waited for 90-180 min in the clinic, whereas 36.1% (35/96) of the patients spent less than 5 min with the doctor in the consulting room. The commonest reason for the long waiting time in the GOPD was the large number of patients with few healthcare workers.

7.METHODOLOGY

The following study was conducted for a period of 4 weeks. The study adopts a descriptive, observational and ex post facto case study approach. In depth review of hospital outpatient process for consultation was from feb 16, 2017 to 28th feb, 2017 was made. Interviews with management and records staff were conducted to validate the secondary data and to gather information required to construct the structural model of the routings in and out of OPD. Direct observations were used to model patient average arrival and length of total time. The survey population of the study were the Opd-patients for consultation in Columbia Asia Hospital ,Kolkata during the period of the study. In all, 341 patients were surveyed for this study. The full study was divided in the following phases:

- **Phase I:** Study of existing functioning of Out Patient Department and understand the waiting time.
- **Phase II:** To shadow the patients and collect data while also studying the functioning of the console, Opd coordinator and understand their role in the scheduling and queue management
- **Phase III:** To analyze the data, intervene the present system, if required ,and to suggest solutions for the same.

The study adopts a descriptive, observational and ex post facto case study approach

Study Design: An Observational cross sectional study

Sampling: Purposive sampling, a non-probability sampling technique in which the researcher selects a group of people because they have particular traits that the researcher wants to study was used.

A non-probability purposive sampling technique would be followed.

Sample Size: 341

Study location: Columbia Asia Hospital,Saltlake, Kolkata

Inclusion Criteria: All OPD patients coming for consultation in the hospital during the course of the study.

Exclusion Criteria: All health checkups ,laboratory, x-ray ,diagnostic and other over the counter procedure patients

Procedure-

I have defined Waiting time by two ways “from registration the time a patient spends in a hospital till the patient enters the consultant room for consultation In this study I would be trying to analyze the definition to understand the average waiting time of the patient to get into the consultants room. The time would be measured in minutes.

8.Data Collection:

The data collection was done by following a patient from the time of registration ,till the time the patient enters the consultants room for consultation. Though this method is very intense but helps to study functional accuracy of the hospital.

1)Source of Data

The process flow analysis would be done by garnering information from three main sources

- Interviews with the stakeholders
 - ✓ Customer care Staff (managers, supervisors, assistants)
 - ✓ Doctors
 - ✓ Nurses
- Departmental Manuals (Standard operating protocols)
- Shadowing the stakeholders and tracking all the processes involved.

a. Primary Data

The time taken at each and every step is noted with the help of a watch from entry into the Opd till the entry into the consultants chamber.

b. Secondary Data

The registration and billing data for each patient was taken from the system.

Other sources of data was -

- OPD Staff (Interviewing the stakeholders)
- Standard operating manuals of the hospital

Mapping of the Processes

The mappings of the processes involved in the department were done mainly by three methods;

- ✓ **Interviews with the stakeholders (Doctors, OPD Staff, Nurses)**
- ✓ **Studying of the Departmental Manuals (Standard operating protocols)**
- ✓ **Shadowing the stakeholders and tracking all the processes involved.**

Process flow

Figures 2.1 depicts the detailed process flow of patients through the outpatient clinic. For in depth understanding ,the processes are grouped into: Appointment-scheduling processes, Processes at the counter(Registration and billing), Nurses processes(Nurses Initial Assessment)and doctors' processes. Nurses processes concern the actions performed on the patient by nurses personnel before or after the doctors' consultation processes.

For better and in-depth understanding, I have grouped the processes into the following-

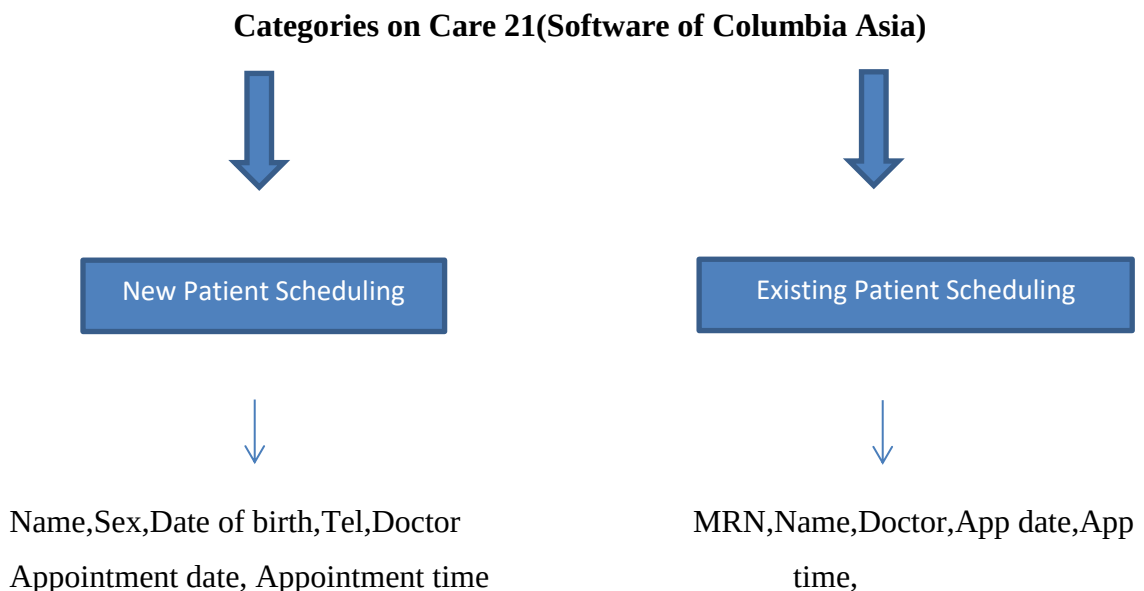
- **Appointment Scheduling process(Handled by Console/Reception)**
- **Registration process and billing process(Handled by Customer Care)**
- **Nurses initial assessment process(Handled by Nurses)**
- **Queue Management process(Handled by Customer care)**
- **Doctors Consultation process(Handled by Doctors)**

A)Appointment-scheduling processes(Detail description)

Patients request appointments at the counter or console in the outpatient clinic, by self, phone or by email. Upon an appointment request, the scheduler performs a number of tasks

- determines the patient's consultation type and preference,
- determines which doctor(s) is/are able to treat this patient,
- determines an appropriate time slot code for this appointment,
- and schedules the patient.

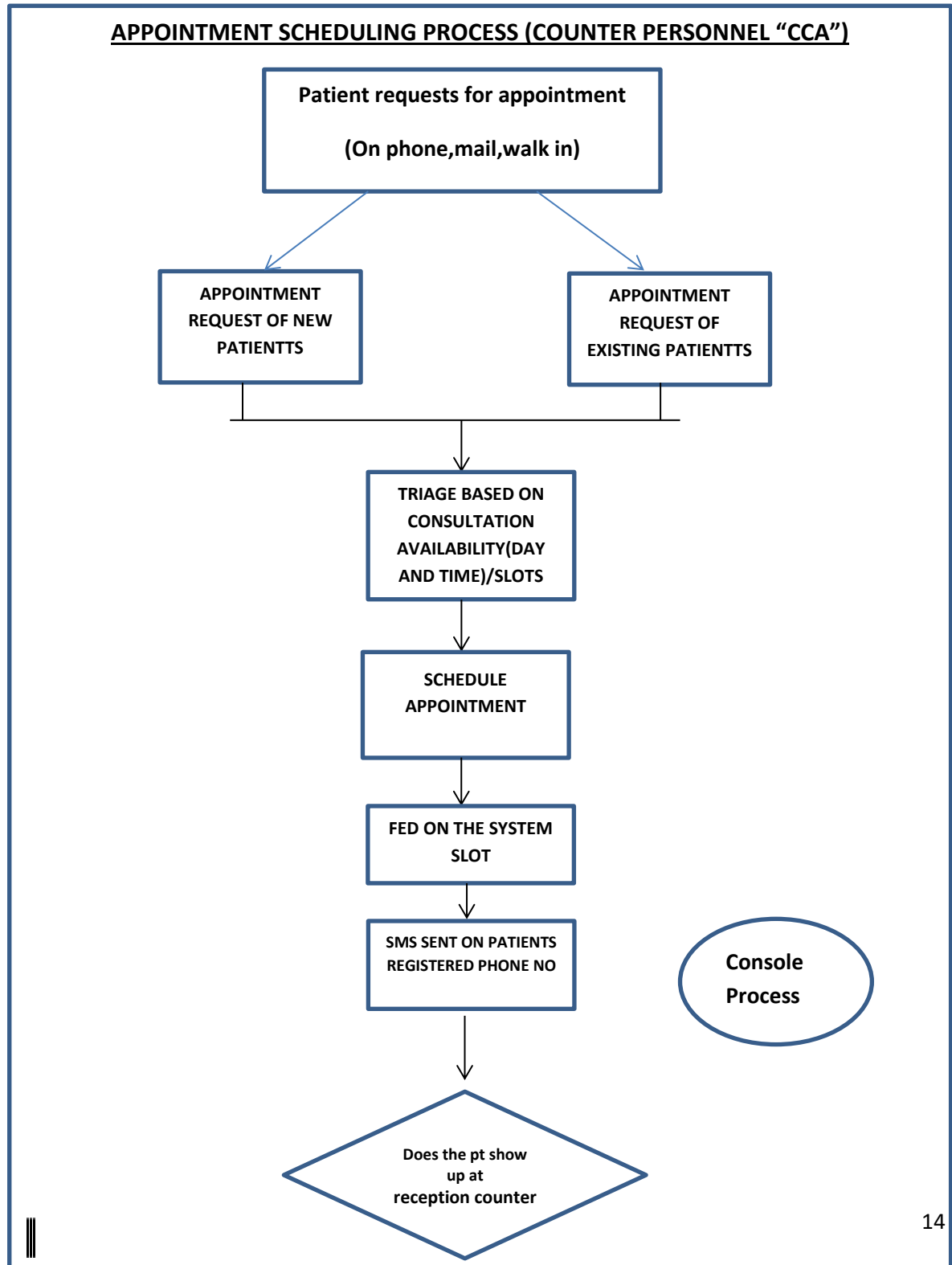
The outpatient department (Customer Care Assistants) distinguishes the patients into two-

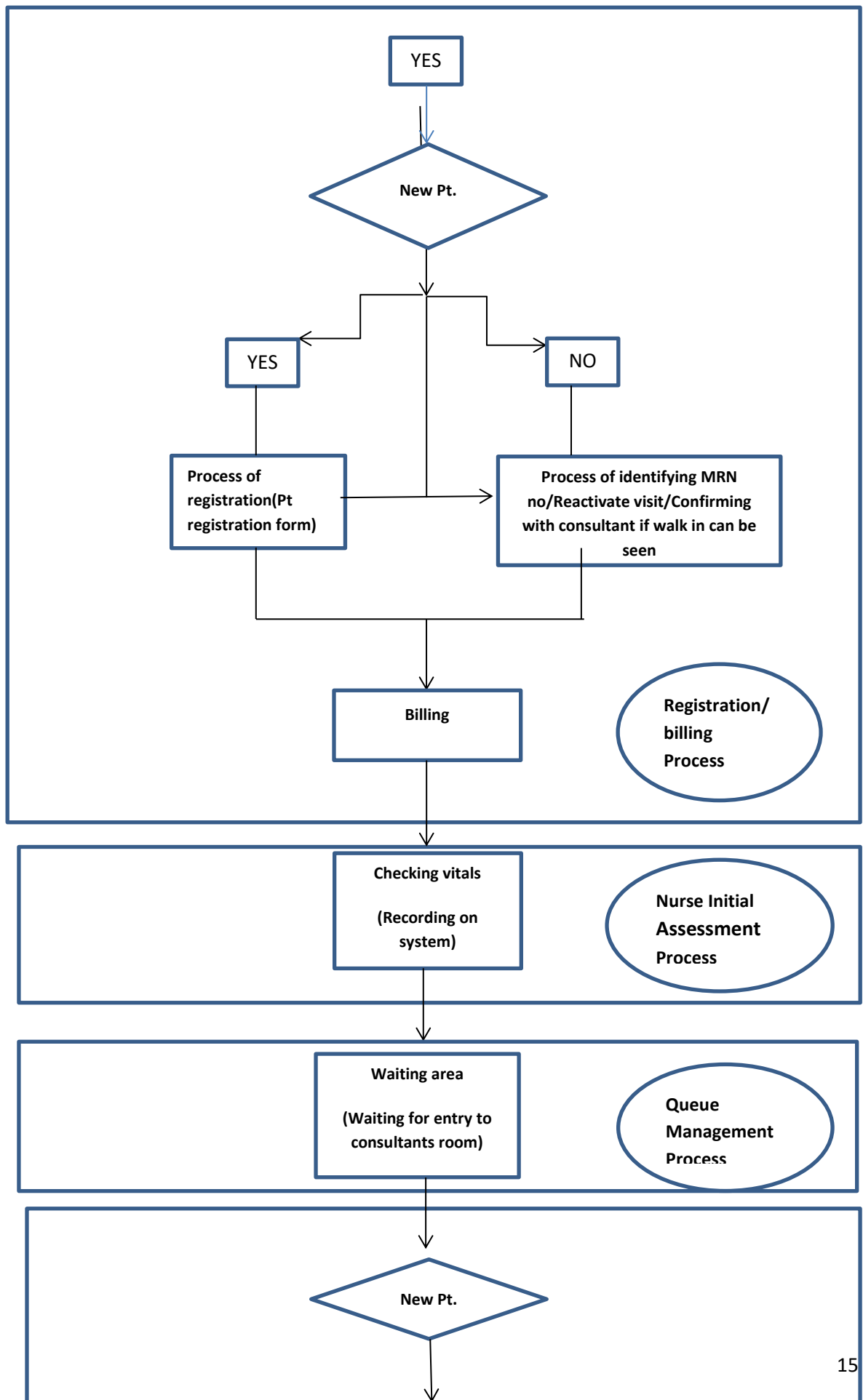


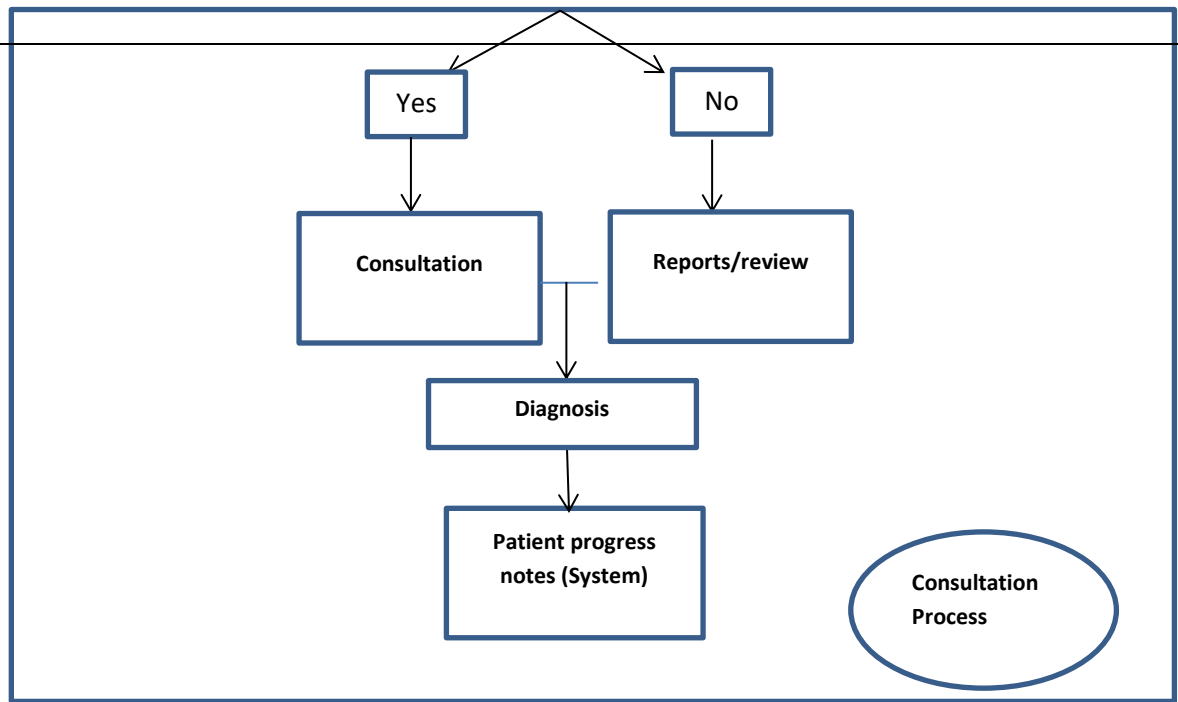
Currently, the outpatient department uses new patient scheduling and existing patient scheduling for patient appointments. A new patient is one who visits the hospital for the first time. An existing patient is one which has been registered in the hospital system before and has an MRN number.

Current Process flow diagram at the hospital

Fig 2.1







Various time definitions used in the study and on dashboard-

Time (T)	Detail
T1	Appointment time
T2	OPD Start
T3	Reporting time of doctors
T4	Billing and registration time
T5	Nursing assessment Start
T6	Nursing assessment stop
T7	Patient reports to coordinator start
T8	Patient Enters OPD
T9	Patient Enters OPD
T10	Patient Exits

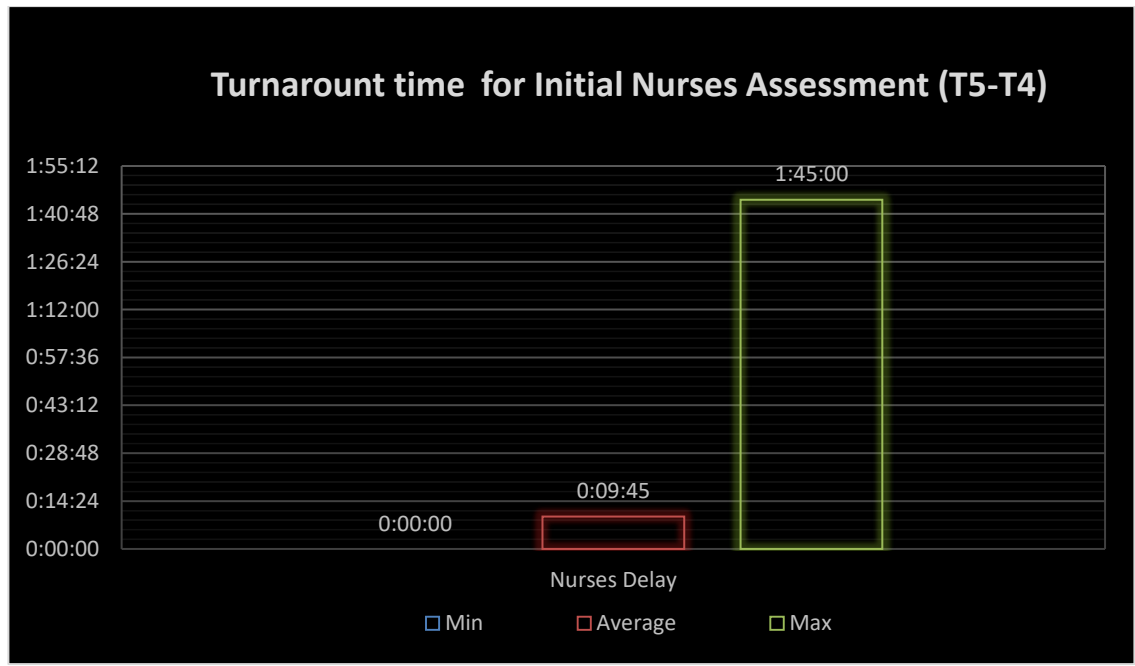
T11	Nursing giving prescription
-----	-----------------------------

Turnaround Time TAT (Tn)	Definition
T3-T2	Doctor Reporting Delay
T5-T4	TAT for initial nurses assessment
T8-T4	TAT for consultation
T8-T1	Overall Wait time for patient
T9-T1	Overall Wait time for patient (According to Doctor progress notes)

Analysis and Results

1)TAT for initial nurses assessment

<u>AVERAGE</u>	<u>MIN</u>	<u>MAX</u>
00:09:45	00:02:00	1:45:00



The above graph explains the average, minimum and maximum waiting timing of the patients for initial assessment in the Opd when they arrive for consultation. It was calculated by subtracting from the nurses initial assessment start timing, the billing and registration timing. It measures the nurses initial assessment delay timing.

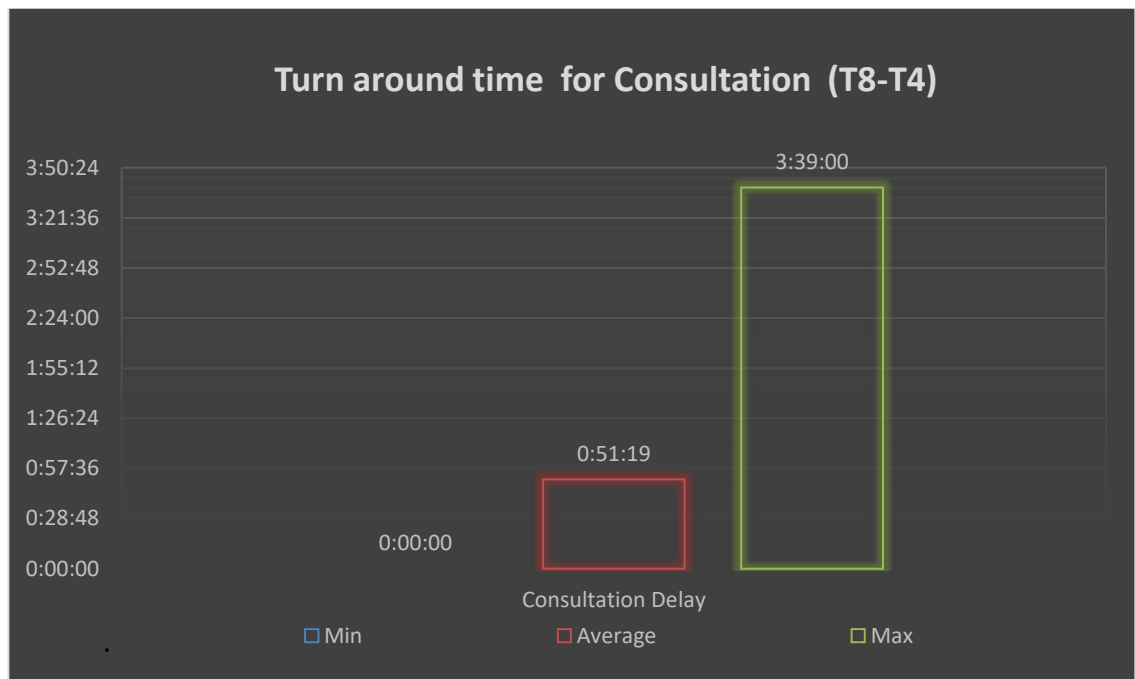
Out of a sample of 341 patients studied,

- Average time for nurses delay was 9 mins 45 sec which is decent
- The minimum waiting time was 0:00:00 mins

- The maximum waiting time for assessment was 1 hours 45 mins which is definitely a concern for the hospital

2)TAT for consultation

<u>AVERAGE</u>	<u>MIN</u>	<u>MAX</u>
00:51:19	00:00:00	3:39:00



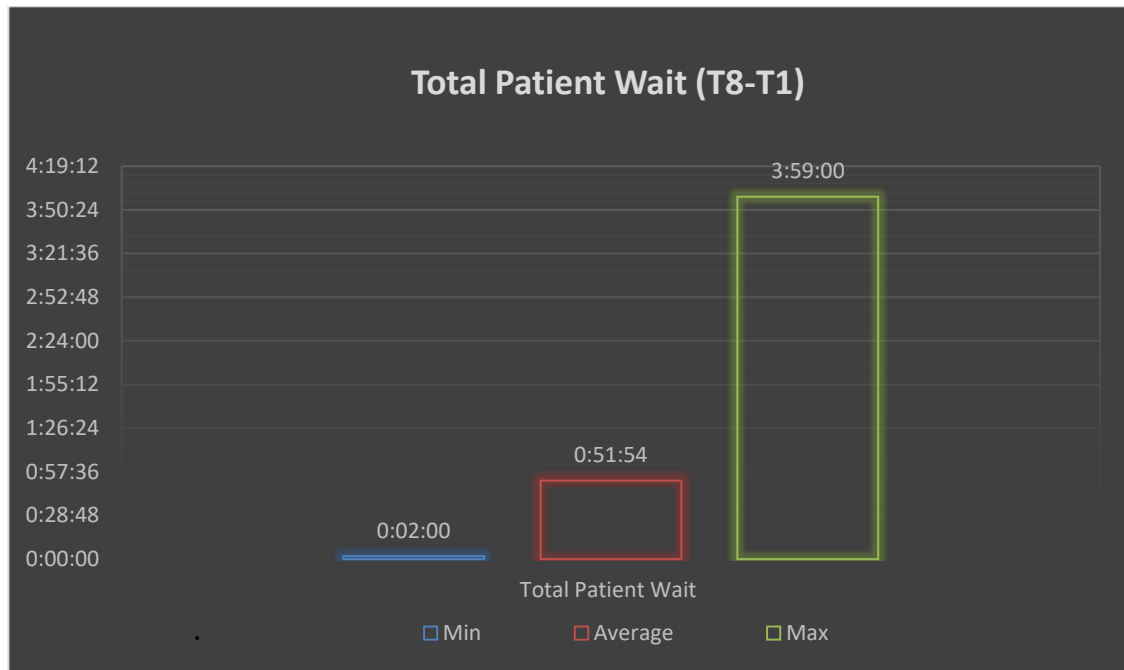
The above graph explains the average, minimum and maximum waiting timing of the patients for consultation in the Opd. It was calculated by subtracting from the time of patient entering the consultant room ,the billing time. It measures the delay for consultation timing.

Out of a sample of 341 patients studied,

- Average delay for consultation was 51mins 19 secs which is a major cause of concern
- The minimum waiting time was 0:00:00 mins
- The maximum waiting time for consultation was 3 hours 39 mins which is definitely a concern for the hospital

3)Total Patient wait

<u>AVERAGE</u>	<u>MIN</u>	<u>MAX</u>
00:51:54	00:02:00	3:59:00



The above graph explains the average, minimum and maximum waiting timing of the total patient wait for consultation. It was calculated by subtracting from the time the patient enters the consultant chamber, the appointment time given to the patient. It measures the total patient wait timing.

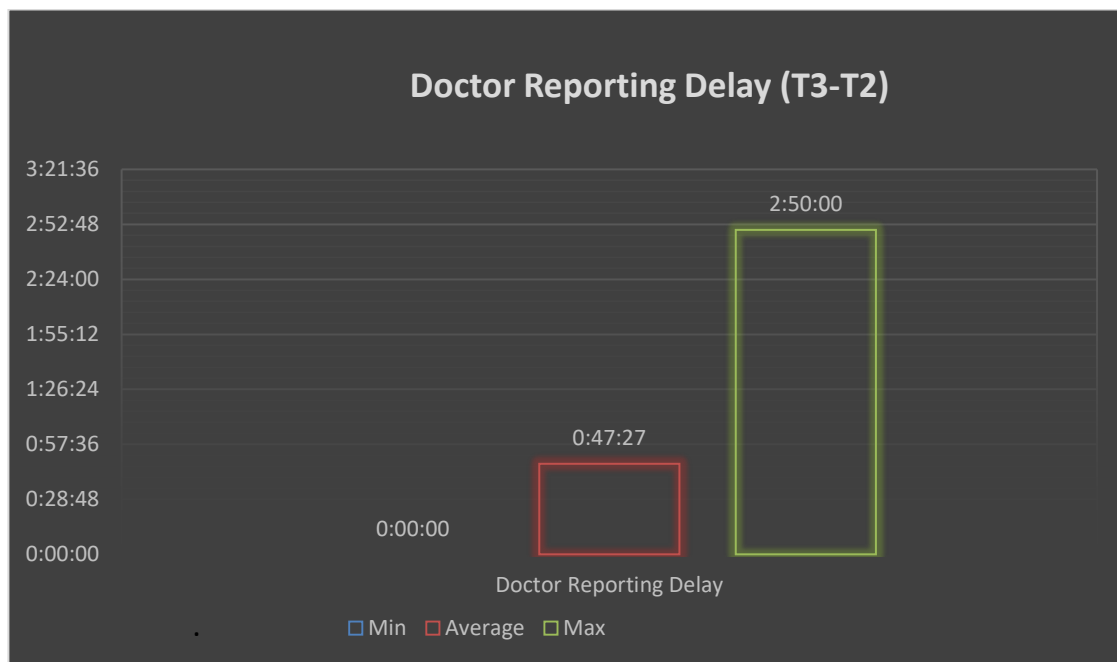
Out of a sample of 341 patients studied,

- Average total patient wait timing was 51 mins 54 secs which is a major cause of concern
- The minimum waiting time was 0:02:00 mins

- The maximum waiting time is 3 hours 59 mins which is definitely a concern for the hospital

4)Doctor reporting delay

<u>AVERAGE</u>	<u>MIN</u>	<u>MAX</u>
00:47:27	00:00:00	2:50:00

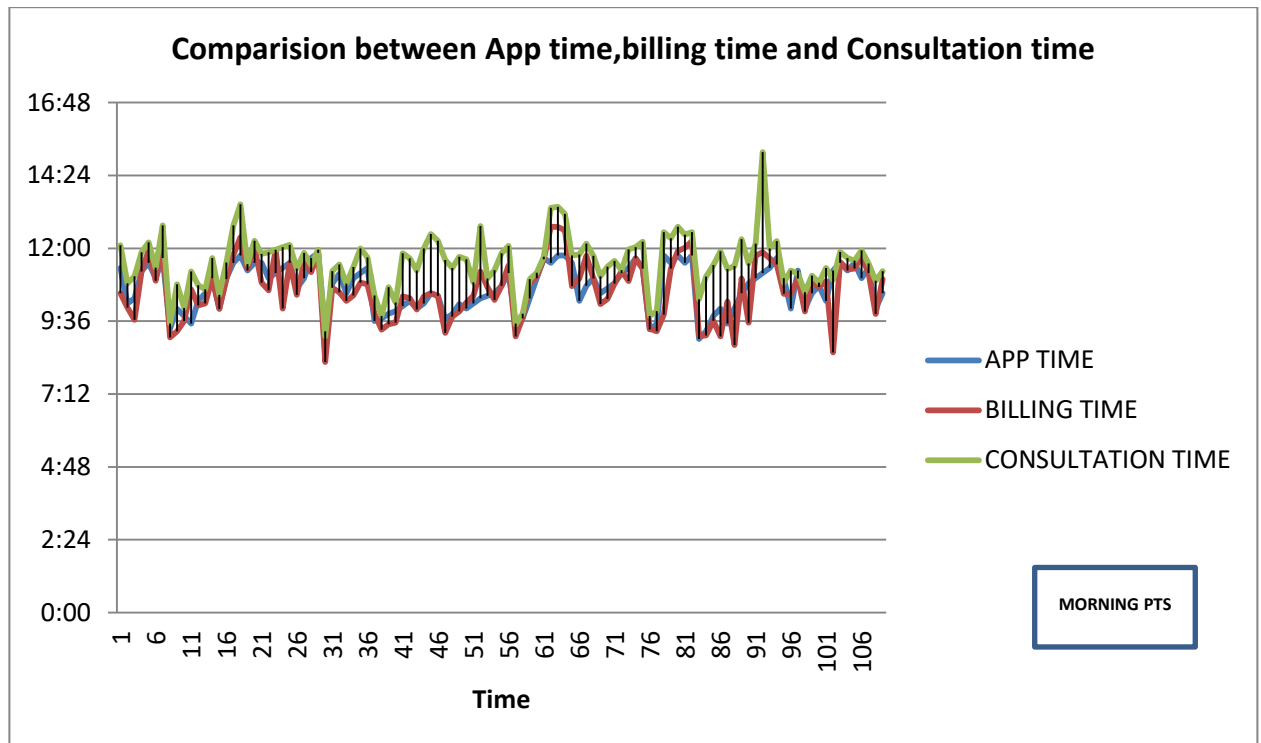


The above graph explains the average ,minimum and maximum delay by the doctors reporting to the Opd for consultation. It was calculated by subtracting from the opd start timing the reporting time of doctors. It measures the doctor reporting delay in the start of consultation

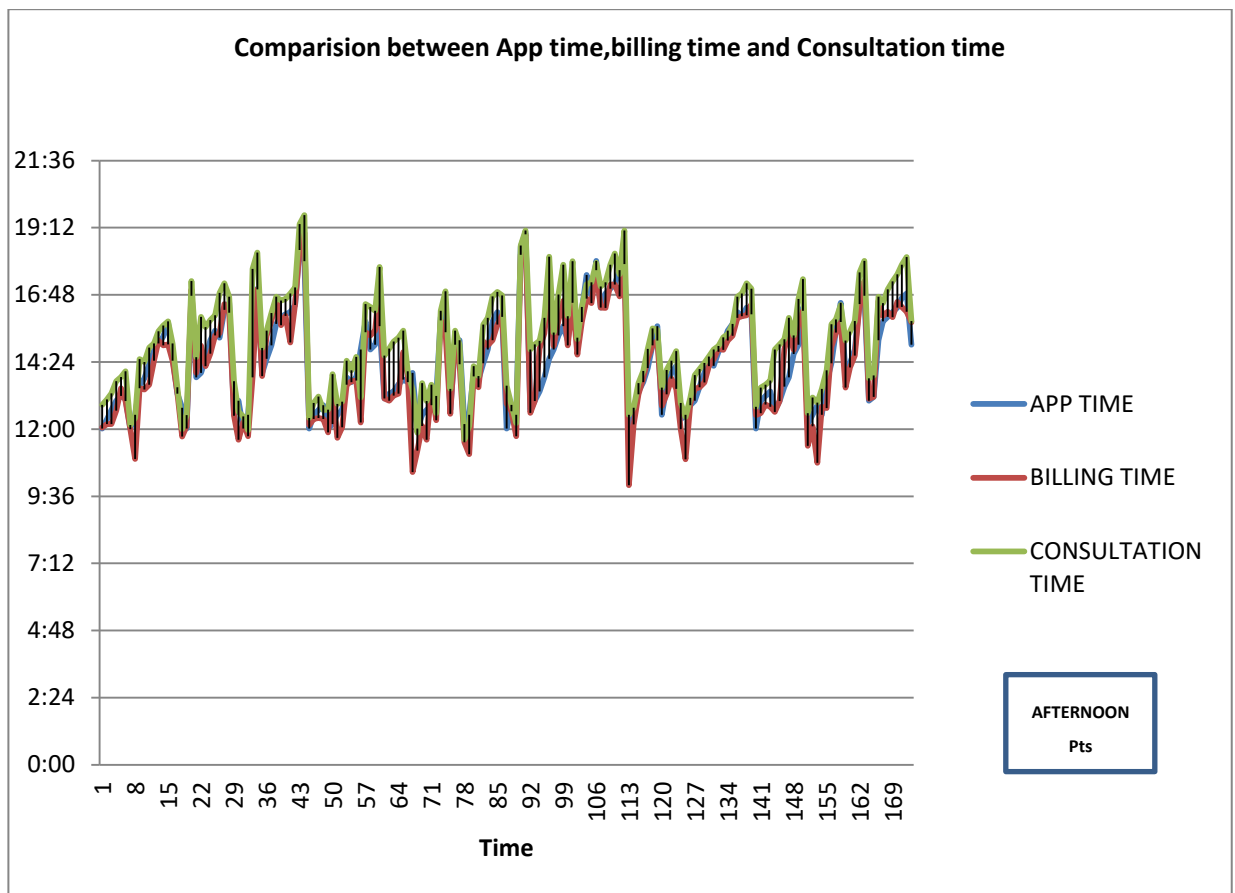
Out of a sample of 341 patients studied,

- Average delay in doctor reporting to Opd is 47 mins 27 secs,which is a major cause of increase in patient waiting time
- The minimum delay in doctor reporting was 0:00
- The maximum delay in doctor reporting was 2 hours 50 mins which is surely a cause of concern for the hospital

5)Comparison between Appointment time, Billing time and Consultation time

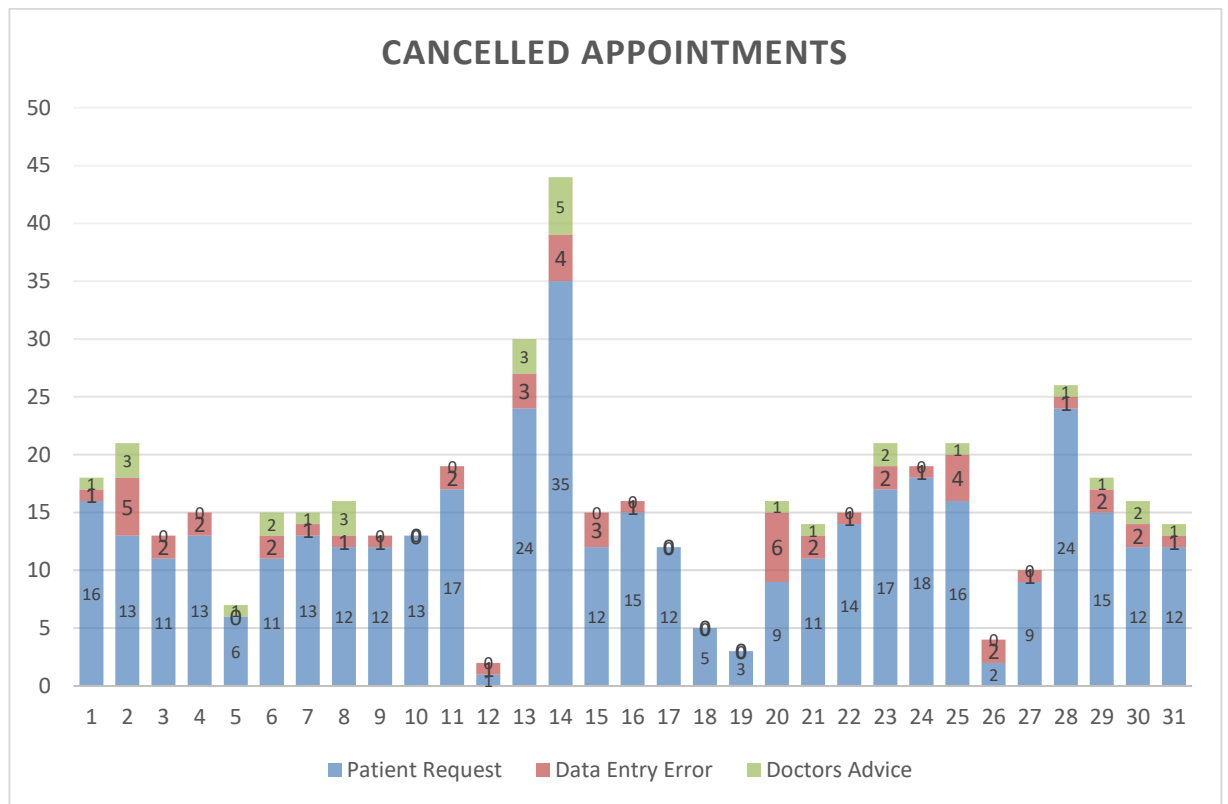


The above line graph for morning patients displays the comparison of the appointment time, billing time and the consultation time which clearly indicates that the discrepancy between the appointment time and the patient reporting time is less as compared to the consultation time for receiving the mode of treatment which tries to exclude any cause of major delay in patient reporting at the scheduled appointment time in the hospital.



The above line graph for afternoon patients displays the comparison of the appointment time, billing time and the consultation time which clearly indicates that the discrepancy between the appointment time and the patient reporting time is less as compared to the consultation time for receiving the mode of treatment which tries to exclude any cause of major delay in patient reporting at the scheduled appointment time in the hospital.

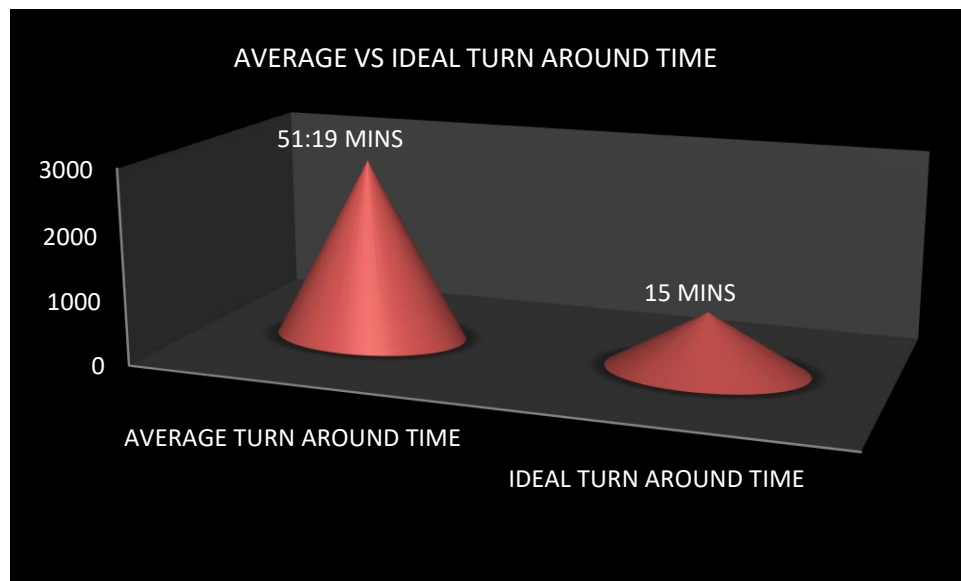
6) Cancelled appointments and their reasons



The afore chart describes the cancelled appointments and the reasons for the same which was taken from the system data during the course of the study.

It can be well be justified from the chart that the major reasons for the cancelled appointments were patient request, data entry error and doctors' advice. It can be well described from the graph that majorly the reason for cancellation of the appointments are due to patient request. This surely indicates a major cause of concern for the hospital and justifies the need for the study.

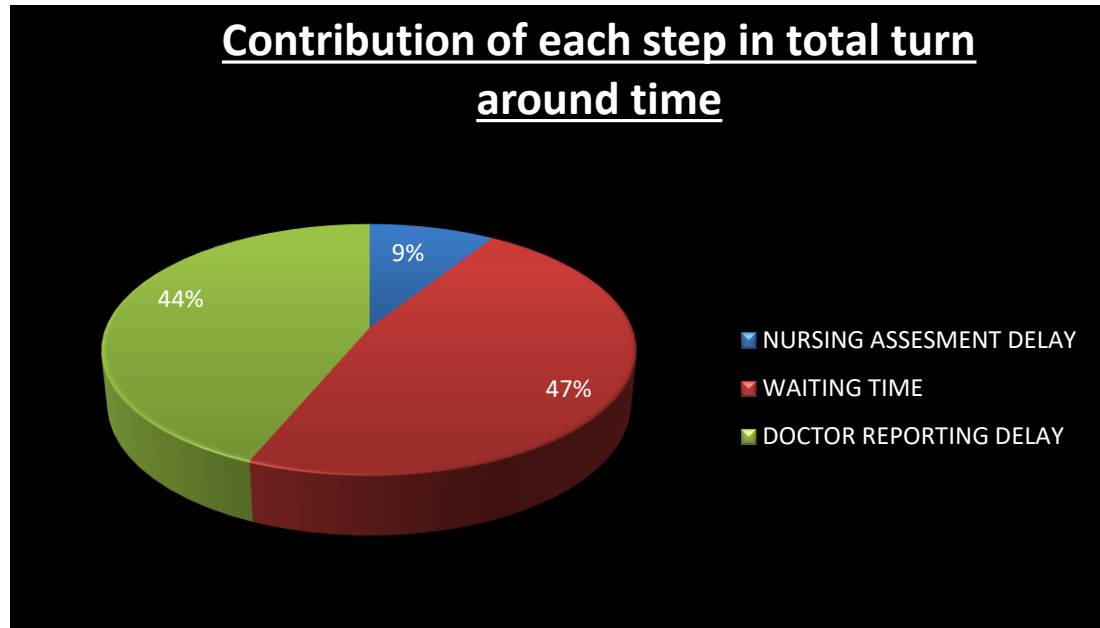
7)SUGGESTED TURN AROUND TIME V/S AVERAGE TURN AROUND:



Interpretation of graph:

The turnaround time as per the department is 15 mins but the calculated average turnaround time is much more than the stipulated time and comes around 51 mins 54 secs which is definitely a cause of concern for the department.

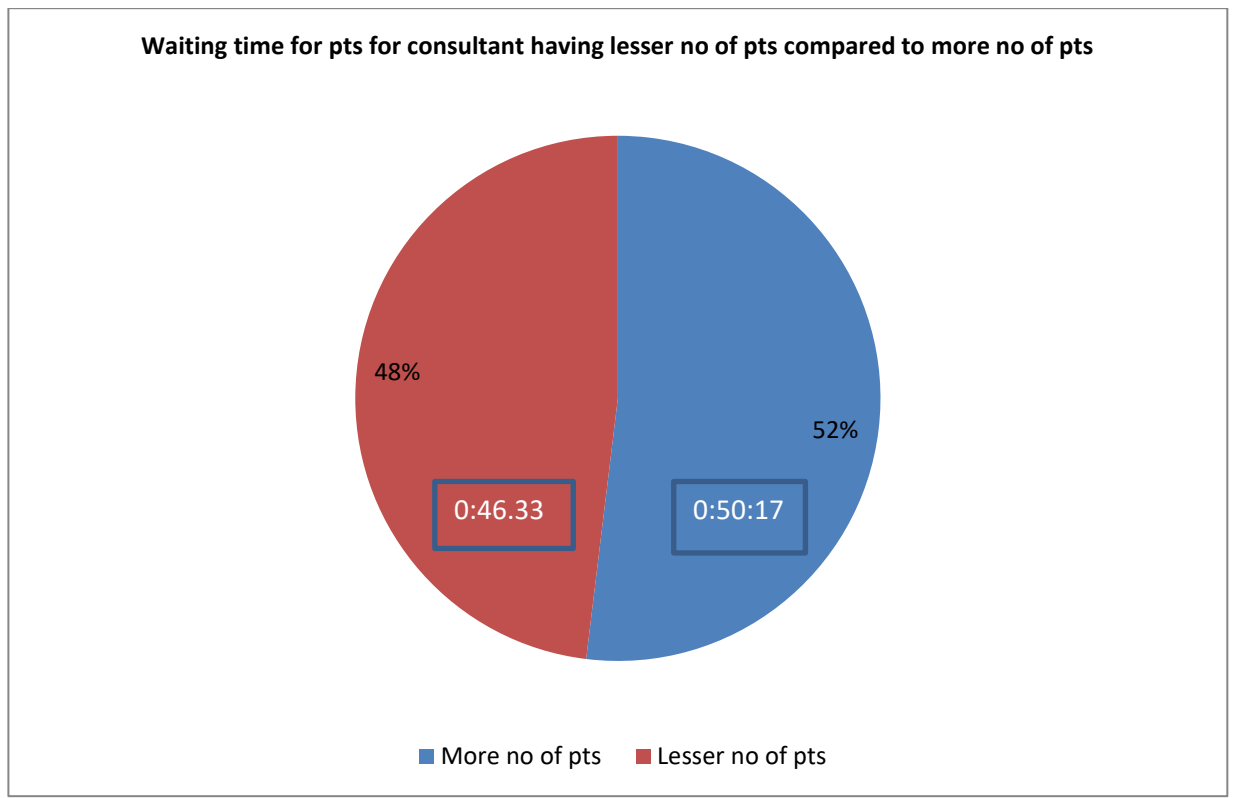
8)Contribution of time taken at each step in total turn around time:



Interpretation of graph:

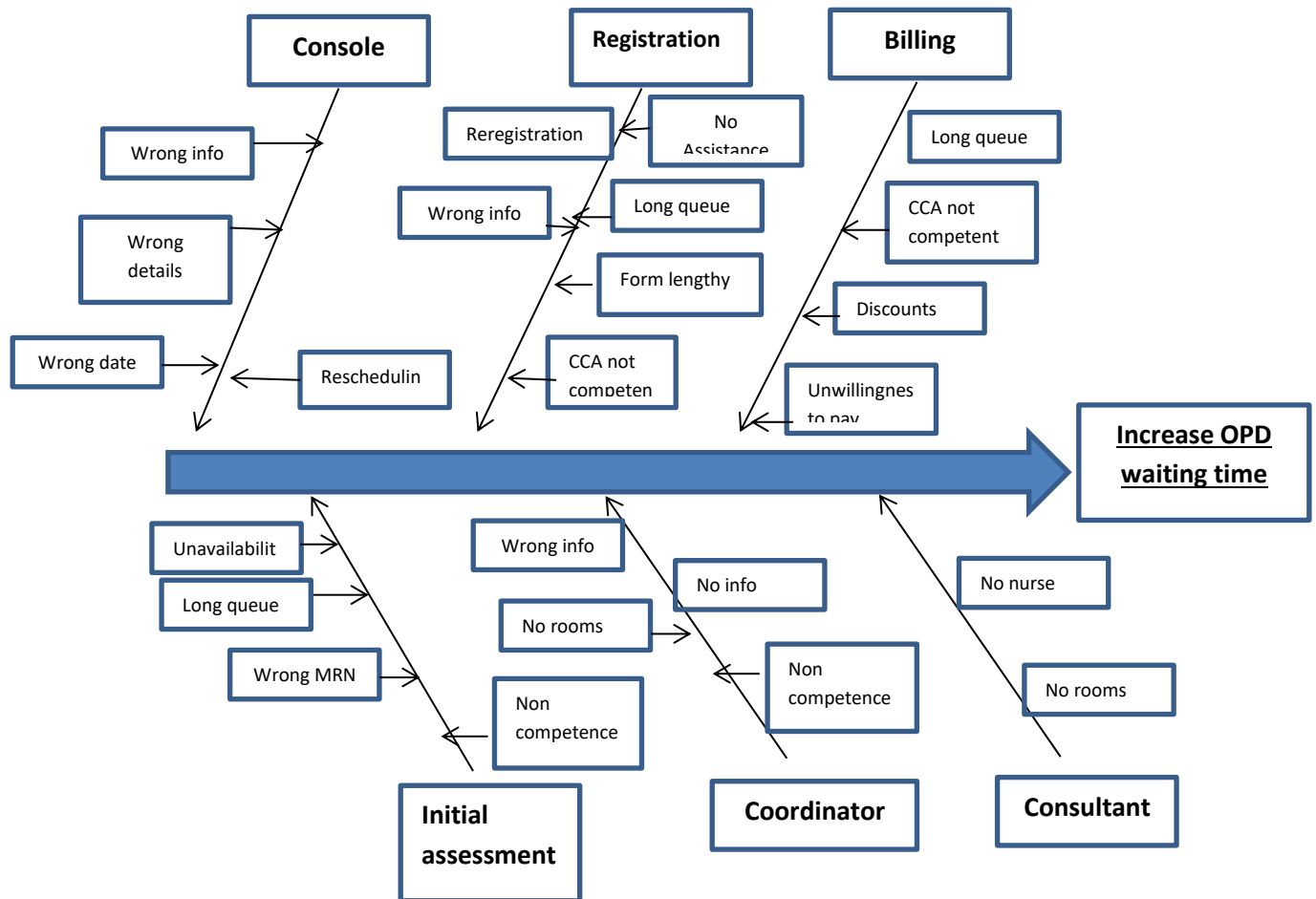
Out of the total turnaround time the maximum portion of time is taken in patient waiting for the consultant which is almost 47% then time taken for doctor to report to the OPD is 44% of the total turnaround time and the least time is consumed by the nurses initial assessment which is 9% of the total. So clearly major portion of the time is consumed by the patient waiting for the consultation which is a cause for concern for the functioning as well as image of the hospital.

9)Comparison of the waiting time for consultant with lesser number of total patients(1,3,4,5,6) to the waiting time of patients for consultants with more number of patients(31,29,28,26,24)



During the in-depth discussion with the management, what was presumed by the management was that most of the waiting is by the consultants having more number of patients which lead to a focused study on the comparison of the waiting time of consultants with more and less number of patients. The afore pie chart compares the total wait of the patients for consultation for consultant with lesser number of appointments(1,3,4,5,6) to the consultants with more number of patients(31,29,28,26,24). The comparison also shows that for the consultants having lesser number of total scheduled patients for a day, the average waiting time is 46 mins 33 secs compared to consultants having more number of patients, where the average waiting time is 50 mins 17 secs. This clearly rules out the assumption that a consultant having a heavy Opd has more waiting time as compared to consultants having very few number of patients.

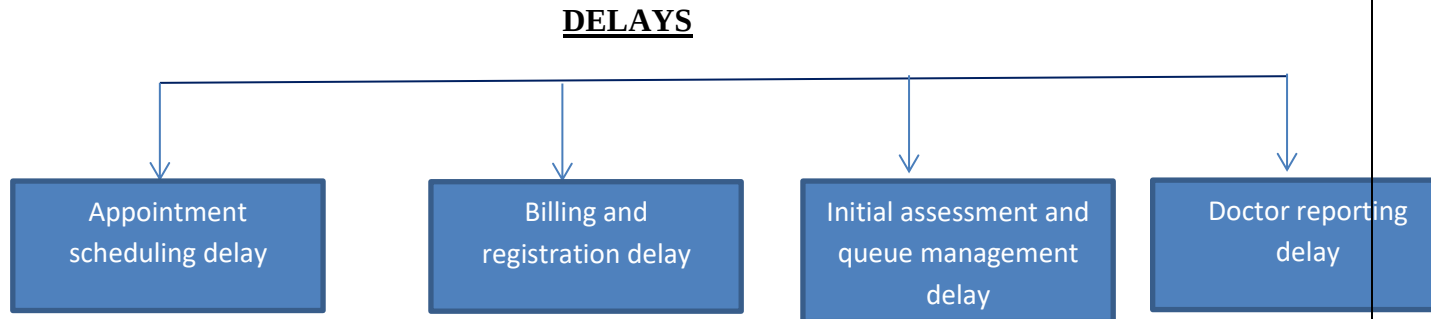
Factors leading to increase in patient waiting time



10)OBSERVATIONS AND FINDINGS

Delay in process flow at different stages is one of the key factors that hinders optimal flow of patients and has a significant impact on the economic outcome of the hospital.

During the course of this study 4 major delays were identified after collection of the data through different sources and the reasons for the same were later analyzed and probable solutions were then proposed.



Reasons for various delays-

1)Appointment scheduling and slot allotment process

It is the most important step of first patient interaction with the hospital and needs to be of value to the patient.

- “Name” currently used as patient identifier for giving appointments due to which ample time is wasted to identify the patient when he finally reaches the hospital.
- Console assistants do not triage the patient depending on the medical condition. As a result there is accumulation of all new and old patients together which leads to overcrowding in the Opd.
- The triage used currently is based on first call, first appointment with no skipping of time slots in between interactions, which is leading to a majority of old patients clubbed together and a majority of new patients clubbed together leading to increase in patient waiting time.
- The Assistants tend to give appointments to all the new patients, without a request for a particular consultant, to the already full slot consultants due to which the slots of other not so popular consultants are remaining vacant, while at the same time they are blocking the OPD room and slots, which could have been taken by other consultants.

- Rescheduling requests from consultants could be seen as an everyday affair in the console, leading to increased inconvenience to all the involved parties and frustration of all the staff and patients.
- List of rescheduled doctors, not available doctors is made by the night shift assistants and call backs are done the next day which is leading to high inconvenience to the patients and increasing the number of drop outs.
- Proper communication of the whole process of consultation including the different steps from entry to exit is not been described verbally to the patient at the time of appointment, leading to unnecessary wastage of time on the actual appointment day.
- There is no intercommunication between the different departments particularly for appointments of USG causing a lot of inconvenience to the patients.

2) Billing and registration process

- A lot of order entry errors were observed during the course of the study.
- Registration form filling took at least 10 -15 mins of the patients time, due to the difficulty with the proficiency of the language .
- E-mail id fields were left empty for various patients leading to difficulty in final identification and delivery of various over the counter reports.
- Patient identifiers are not taken properly leading to difficulty and unnecessary waste during the next visit of the patient. In most cases only one telephone number is taken leading to other errors.

3) Initial Assessment and handing over of the prescription process and coordinator queue management process

- Not a lot of delay was observed during this process.
- Mostly delay in dispensing of files to new patients could be observed.
- Also, Next appointment for review patients was not administered on the system for most of the patients leading to unnecessary hurdles for the next visit of the patient which could be well sorted out on the day of the visit itself.
- The queue management process is in the hands of the CCA, the manual list creates a difficulty for the assistant to find out the requested consultant and the patient queue number.
- The CCA also, in varied situations does not clarify to the patient the correct time of arrival of the consultant due to himself not being told the exact reason of reporting delay to the OPD.
- The manual subscript of the list leads to the patients questioning the authenticity of the waiting number as described by the CCA.
- Due to late arrival of the consultant to the chamber, there is overstay beyond the OPD timing and the room is blocked leading to the overall process being prolonged.

4)Doctor reporting delay and consultation process

- Doctors report to the OPD late without giving appropriate reasons for delay in reporting to the opd leading to overcrowding and waiting in the OPD.
- There is no accountability for reasons for rescheduling of the OPDs,not even to the CMS,which is leading to chaos in the OPD.
- Initial screening and vital recording also in most of the cases is done by the doctor himself, leading to increase in waiting time of patients and underutilization of two nurses at the workstation.

11)Solutions to the delays with recommendations

1)Appointment scheduling and slot allotment process

Key stakeholder responsible for the process-Customer Care Assistant, Patients, Other interdepartmental communication

Key areas of work-Training of the assistants,Re-engineering the process

- While giving an appointment the scheduler should be competent enough to
 - ✓ perform a triage on the patient's urgency,
 - ✓ determines the patient's consultation type,
 - ✓ determine which doctor(s) is/are able to treat this patient,
 - ✓ determine an appropriate time slot for this appointment,
 - ✓ and schedule the patient.
- The communication is essential in the normal routine being followed and additionally important in
 - ✓ New Patient scheduling

Recommendations

- What is required is to train the assistant to identify correctly the patient type(New, Existing) and to note down the correct Phone number.
- Instead of "Name" currently used as patient identifier for giving appointments, "Phone number" should be used which would significantly reduce the number of errors.
- In the patient scheduling appointment on the system for existing patients a new sub column of Tel No can be added which would reduce the chances of errors and take off the overload for the assistants and quicken the whole process flow.

- What is also vital to note is the triage of new patients. It is important for the console handling assistants to train them to distribute new patients without the request for a particular consultant, to distribute them to other consultants with lesser number of patients. This would help to significantly increase the footfall of the patients as currently 84% of the patients for consultation are “Old” patients and we should work on increasing the horizon and catchment of new patients.
- Without input of any more resources what can be done is to diversify the different patients to different consultants while increasing the catchment of new patients for the most popular consultants.
- It is also possible to group patients on basis of diagnosis and use this classification while assigning patients to doctors.
- As we are already using an appointment system with dedicated time slot usage and an individual block appointment rule, all we need to do is train the scheduler to assigns patients with low variance of consultation duration to the beginning of a clinic session, by this we would be able to achieve a reduction in the average waiting times, and to an extent solve the room shortage problem. This appointment system involves a relatively small number of changes to the current appointment system.
- Another area of improvement would be to train the CCA’s to note down the reasons for rescheduling of OPDs at the time they are changing the slot for the consultant, while communicating the same to all the consultants. This would largely help in reducing the current inconvenience to the patients and the staff while reducing the number of drop outs. A monthly report can be given to the CMS for the number of consultants rescheduling the OPDs and the reasons for the same. It would help to a very large extent to reduce the manual labor of the staff and the inconvenience for the patients whereby holding a sense of responsibility about being monitored would reduce the rescheduling rate.
- The same was discussed during the course of the study with the CMS of Columbia Asia and his agreement to the same was received informally.
- Another key area of improvement would be the Communication register with the Customer Care, the list of all the doctors ,doctors not available,dr rescheduling the Opd and to doctors for whom the SMS is to be sent is currently made manually by the night shift CCA a day prior to the scheduled Opd .The CCA calls up the scheduled doctor and reconfirms the opd.In case of rescheduled Opds,he is calling the patients and in some cases patients are not reachable.This is adding on to the increased frustration of the staff and unnecessarily increasing the workload while at the same time disrupting the brand image of the hospital. What can be done to solve this major problem is to make a list 2 days prior to the scheduled OPDs.The same when pilot studied by me for a period of 7 days, the variation in the number of scheduled appointments for any consultant was just 3-5% while it would significantly increase the utilization rate of the OPDs and increase the footfall.

- A list of the scheduled consultants for a particular day, if auto generated the system would hereby reduce the workload of the staff.
- Another observation which would be helpful and very significant for reducing waiting time would be instead of the CCA held responsible for change in slots and Opd timing, making the consultant responsible for handling his own OPD hereby with reasons for reschedule of the opd to the CMS and changing his slot timing on the system itself. If cannot be done an alteration to the same would be sending a mail across to the CMS while CC to the CCM and informing to the console as well to intimate to the patients.
- The training should be done on giving an overview to the patient about the whole process of OPD consultation. It should include vital details like reporting at least 10 mins prior the appointment time for billing on the ground floor and then directing the patient to go at the designated floor for consultation.
- Appointment handling and scheduling with proper intercommunication with other departments can overall increase the efficiency of the existing system.

2) Billing and registration process

Key stakeholder responsible of the process-CCA

Key areas of work-Training

Recommendations-

- The overall billing and registration process can be improved by training of the staff about the order entry errors while emphasizing upon the importance of fields like patient phone number and MRN number. The training schedules lacks the vital element of emphasis on the importance of these fields, which is resulting in a lot many errors in registration, errors in billing and unnecessary workload of the staff.
- A self-entering fields for registration such as Kiosk can be used to reduce the delay in manual entry of the fields on the patient registration form.
- To further reduce the time spent in manual entry, a bilingual language form can be used to help in reducing the gap in understanding of the English language by majority of the patients who are fluent in only the local language.
- Another observation in the front desk was the enhancing of the home sample collection and physiotherapy sessions which we are trying to increase the customer base for, the print outs and flyers are being kept without any distribution to any one customer during the whole course of study. We would hereby increase on the market share if we develop upon the already introduced services with simple steps in the current process.

- A separate tab for the Out Patients can be made on the system itself including all the over the counter procedures which would simplify the billing and the whole process of cash collection exclusively for Over the counter patients.
- Another recommendation would be creation of email id for patients who do not have a mail id. This would add value to the patients visit and help in building image as well as act as a major tool for further marketing initiatives as well as help in gathering feedback of the IPD patients which is one major performance indicator for the unit.

3) Initial Assessment and handing over of the prescription process

Key stakeholder responsible for the process-Nurse

Key areas of work-Reengineering the process

Recommendations-

- There is very less delay as far as these both processes are concerned. The only suggestion would hereby be to remove the unnecessary process of handover of the prescription by the nurses. This could be done by the doctors instead. As a part of the current process the doctors are typing down the diagnosis on the system, only the print out has to be dispensed to the patient which could very well be done by the doctor himself.
- This would also increase the patient satisfaction and add value to his visit.
- It would help in the utilization of the extra manpower of the nurse handing over the prescription for some other vital activity.
- Another observation was the location of the files. The files are located on the desk far away from the prescription handing over nurse, she has to all the way travel and bend down for the file, which is leading to loss of time and human motion for a non-value adding activity. There is sufficient space below the nurse desk to keep the file, if not there the desk size can be increased with a space to keep files.
- During the OPD sessions for specialties like pediatrics and ortho where the footfall of patients is more, indentation can be done from the nursing station for frequently used vaccines, plasters and other Opd procedures. This would reduce the patient's frustration to travel all the way down to the pharmacy, while it would also reduce the doctors idle time to wait for the prescribed medication. As we have the cashier on the nurse station itself, it would be quite convenient to collect the cash at the station itself without having to add additional manpower.
- For Opd procedures like vaccination, the dose and medication for the next visit can be written by the consultant on the prescription itself while communicating the same

to the patient to carry it with him for the next visit, this would decrease the waiting time significantly.

4) Coordinator queue management process

Key stakeholder responsible for the process-Customer Care Assistant, Other departmental intercommunication

Key areas of work- Training, Reengineering the process

Recommendations-

- The coordinator instead of having to take out the list of patients from the system for each consultant and speciality, the same can be reflected on the system with a token number, and also on the overhead displays according to the patient number and waiting queue can be color coded.
- This would increase the transparency in the system and thereby achieve patient satisfaction while avoiding hassles for the coordinator and losing on the time and motion.
- If not these major changes, a list can be taken out a day prior to the scheduled OPD by the CCA instead on arrival of the patient to the station.
- Also to be noted is the correct dispensing of information to the patient consisting of information right on arrival of the patient to the station rather than on questioning about the same. It would give a sense of value to the patient and reduce to a great extent the stress and frustration. Information included should be-
 - ✓ The waiting area specifically in front of the designated OPD. The OPD number should be told to the patient
 - ✓ The arrival time of the doctor
 - ✓ The current status of the queue
 - ✓ The reporting patients number and waiting
 - ✓ If waiting is more, then the cafeteria or other test related information
 - ✓ Another recommendation would be to train the CCA to report to any delay of a patient waiting for more than half an hour for consultation to the CCM and noting down the consultant reporting time at the OPD, this would help in increasing the discipline among the consultants.

5) Consultation Process

Key stakeholder responsible for the process-Doctor

Key areas of work- Training, Reengineering the process

Recommendations

- Increasing the number of junior resident doctors for initial screening of the patient
- Dispensing of the prescription by the consultant himself to the patient which would make him seek value from the visit.
- Vaccination by the nurses instead of the doctor in the nursing room would reduce waiting time of patients.
- Increasing the discipline in reporting at the Opd by reporting of reasons for rescheduling to the CMS and making self in charge of ones Opd by filling in the rescheduling on the system while intimating the same to the console.

Other vital observations in the Opd

- Feedbacks of the patients are an integral quality indicator of the department of customer care, the customer care assistants should be trained to ask for feedback from the outpatients so as to help us in continual growth of our hospital.
- Feedback forms are not kept at a location where they are visible to the patients in the Opd. A suggestion would be to keep the forms at not just one location but at many more locations across the hospital, so as to get in touch on a first hand basis on the current delivery of services and so as to tap onto the view of the customers for our services which would play a vital role in service delivery and make the customer believe in the sense of involvement as a part of the hospital decision making process.
- As a part of this, touch points of the patients which are untapped currently for feedback are the Opds, the laboratory, the radiology, the pharmacy, the ER and the Café. As a suggestion for creating a belonging in the mind of the customer it is a vital instrument.
- In particular to the Opd, the feedback drop box is not named or highlighted so as to describe its role. It is important to name the box and highlight it. Another drop box can be placed on the second floor Opd and in front of the patient waiting area.
- The patient feedback demonstrates a statistical technique that can help to identify such priority areas by showing those aspects of care most strongly associated with the overall rating of care
- As major part of my study was in the Opd, another observation was the collection of samples not done by the pharmacy, which is spoiling the brand image of the hospital, the patients on frequent occasions could be seen carrying their own samples to the lab, which is decreasing the value of services provided to them. A suggestion on this would be for a particular time of the day or depending on the sample number, the assistant himself carry the samples to the laboratory.

Conclusion

Reengineering the processes has great potential for increasing productivity through reduced process time and cost, improved quality, and greater customer satisfaction. As Healthcare all across the globe are facing several problems like excessive waiting times, access to important information, high costs of delivery and medical errors. Healthcare Managers seek the help of process reengineering methods to discover the best processes for performing work, and that processes are reengineered to optimize productivity without compromising on quality. Patients attending each hospital are responsible for spreading the good image of the hospital and therefore satisfaction of patients attending the hospital is equally important for hospital management. Various studies about outpatient services have elicited problems like- overcrowding, delay in consultation, proper behavior of the staff etc. This study reveals the average time spent by the patients and also the reasons for the prolonged waiting time. The study throws light on the various services provided by the hospital and the total time consumed on each activity. Amid the complexity of operating a busy primary care facility and an array of structural and relational factors, the action research collaboration demonstrated that simple changes generated in situ can help address the vexing challenge of persistent lengthy wait times. Further research is needed to assess ongoing sustainability and broader applicability, but results underscore the potential value in enabling facilities to collect and analyze operational data.

References

1. AAMC (Association of American Medical Colleges). *GME funding: How to fix the doctor shortage*.
https://www.aamc.org/advocacy/campaigns_and_coalitions/fixdocshortage/
(accessed January 8, 2015).
2. Bisgaier, J., and K. V. Rhodes. 2011. Auditing access to specialty care for children with public insurance. *New England Journal of Medicine* 364(24):2324-2333.
3. Bogdan, G. M., J. L. Green, D. Swanson, P. Gabow, and R. C. Dart. 2004. Evaluating patient compliance with nurse advice line recommendations and the impact on healthcare costs. *American Journal of Managed Care* 8:534-542.
4. CAEP (Canadian Association of Emergency Physicians). 2015. *Canadian Triage and Acuity Scale (CTAS)*. <http://caep.ca/resources/ctas> (accessed January 2015).
5. Cassel, C. K. 2012. Retail clinics and drugstore medicine. *Journal of the American Medical Association* 307(20):2151-2152.
6. Charles, B. L. 2000. Telemedicine can lower costs and improve access. *Journal of the Healthcare Financial Management Association* 54(4):66-69.
7. Cosgrove, D. M., M. Fisher, P. Gabow, G. Gottlieb, G. C. Halvorson, B. C. James, G. S. Kaplan, J. B. Perlin, R. Petzel, G. D. Steele, and J. S. Toussaint. 2013. Ten strategies to lower costs, improve quality, and engage patients: The view from leading health system CEOs. *Health Affairs (Millwood)* 32(2):321-327.
8. DelliFraine, J. L., J. R. Langabeer 2nd, and I.M. Nembhard. 2010. Assessing the evidence of six sigma and lean in the health care industry. *Quality Management in Health Care* 19(3):211-225.
9. Espinosa, J. A., P. M. Treiber, and L. Kosnik. 1997. A reengineering success story: Process improvement in emergency department x-ray cycle time, leading to breakthrough performance in the ED ambulatory care (Fast Track) process. *Ambulatory Outreach*:24-27.
10. Gabow, P. A. and P. L. Goodman. 2015. *The lean prescription: Powerful medicine for our ailing healthcare system*. London, UK: CRC Press.
11. Gianni, R. I. and T. D. Mackenzie. 2000. Predicting missed or cancelled appointments. *Journal of General Internal Medicine* 15(Supplement 1):227.
12. Gilboy, N., P. Tanabe, D. Travers, and A. Roseau. 2012. *Emergency Severity Index: A triage tool for emergency department care. Implementation handbook*. No. 12-0014. Rockville, MD: Agency for Healthcare Research and Quality (12-0014).
13. Graban, M. 2008. *Lean hospitals: Improving quality, patient safety, and employee satisfaction*. Abingdon, UK: Taylor & Francis.
14. HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems Survey). *Hospital Consumer Assessment of Healthcare Providers and Systems Survey*. <http://www.hcahpsonline.org/home.aspx> (accessed October 2, 2014).
15. Hsia, R. Y., S. M. Asch, R. E. Weiss, D. Zingmond, G. Gabayan, L. J. Liang, W. Han, H. McCreath, and B. C. Sun. 2013. Is emergency department crowding associated with increased "bounceback" admissions? *Medical Care Journal* 51(11):1008-1014.

