

BUSINESS PROCESS ANALYSIS OF MRI DEPARTMENT

**Internship Training
at
P.D. Hinduja Hospital and Medical Research Centre,
Mumbai**

**By
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**Under the guidance of
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**MBA Hospital & Health Management
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Internship Training

At

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By

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Under the guidance of

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Post Graduate Diploma in Hospital and Health Management

Year 2013-2015



TO WHOMSOEVER MAY CONCERN

This is to certify that **Ms Chandra Prabha** student of MBA Hospital and Health Management from IIHMR University, Jaipur has undergone internship training at P.D. Hinduja hospital & medical research center, Mumbai **from 01 april 2015 to 12 May 2015.**

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.



Col. Dr. Ashok Kaushik

Dean, Academics and Student Affairs

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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Business process analysis of MRI section, imaging department of P.D. Hinduja hospital & medical research center** and submitted by **Chandra Prabha** Enrollment No. **1433** under the supervision of **Dr Tanjul Saxena** for award of MBA Hospital and Health Management of the university carried out during the period from **1st April 2015** to **May, 15th 2015** 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.

Signature



Chandra Prabha

PREFACE

The objective of this study was to understand and analyse the business process in MRI department to make it more convenient for all the stakeholders (patient, staff, management etc) and much faster for P.D. Hinduja hospital, for that the MRI section of the Imaging department was thoroughly studied through business process analysis. It helped in obtaining the assessment of the process and suggest the recommendations for improvement. The study methodology included time motion data of 150 patients at two stages, firstly for investigation and secondly for evaluation. Out of several recommendations, certain could be implemented in the given time frame. Hence, they were implemented and their impact on the process in terms of effectiveness and greater efficiency was evaluated through time motion Data of same sample size i.e. 150 patients.

The project undertook three phases-analysis, implementation and evaluation. The analysis part led to the thorough understanding of the business process and identification of the existing gaps. The changes implemented mostly dealt with the communication to the patients and based on scheduling. Some additional signboards incorporated in the department have led to improvement in the process at different fronts.

Further, the process holds the scope of improvement by incorporating other changes as well. The improved efficiency of the process will lead to higher revenue generation and enhanced patient satisfaction.

Chandra Prabha

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The satiation and euphoria that accompany the successful completion of the project would be incomplete without the mention of the people who made it possible. I would like to take the opportunity to thank and express my deep sense of gratitude to my Project Mentor Dr. Swapnil Kharnare. I am greatly indebted to him for providing his valuable guidance at all stages of the study. His advices, constructive suggestions, positive and supportive attitude and continuous encouragement, without which it would have not been possible to complete the project.

I would also like to thank Dr Preeti Goraksha for giving me the opportunity to work on this project and learn. And also for her endless guidance and positive support through out the entire study.

I owe my wholehearted thanks and appreciation to the entire staff of Hinduja Hospital for their co-operation and assistance during the course of my project.

I would like to express my special gratitude and thanks to my guide Dr Tanjul saxena for giving me such attention and time. However, it would not have been possible without her kind support and help through out this study. At last, but not the least I am thankful to my teachers and other officials of my college for their encouragement and support during this internship.

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Business process analysis of MRI department of P.D Hinduja hospital & medical research centre, Mumbai

Abstract

Background:

This study included all the three stages of business process analysis and additionally assessed the implemented changes intended for improvement of the existing business process.

Objectives:

The main objective of this study was to conduct the business process analysis of MRI section, Department of Imaging, P.D. Hinduja Hospital and Medical Research Centre and to assess the impact of changes implemented.

Methods:

The project undertook the Time motion study of 150 patients both at the investigative and evaluative stage. Other methodologies used were work shadowing, observation and interview with the stakeholders namely front desk staff, technologist, radiologist, nursing staff , support staff and patients.

Results:

The changes implemented mostly dealt with the communication to the patients and based on scheduling. Some additional signboards incorporated in the department have led to improvement in the process at different fronts. Earlier, all the GA patients were being called together at 8:30 AM; Now 2 patients are called at 8:30, next 2 at 9:30 AM and rest at 10:15 AM. In addition to these, the total number of slots being booked increased to 41. The key result is the decrease in the preparation time. The preparation time got reduced by 51.2% in case of GA cases and by 40% in Non GA cases. The idle time for the machines also got reduced in case of GA patients. The overall waiting time also decreased for 16.37 % for GA patients. The gaps in the process were identified using cause & effect analysis (Fish bone/Ishikawa diagram) and RACI analysis (Responsible, accountable, consulted and informed).

The qualitative (cross-sectional) analysis in which each step of the process flow that the patient goes through was examined explained the possible reasons for the gaps are discussed thoroughly.

Conclusion:

The implementation is an ongoing process only certain recommendations could be implemented due to the time constrained feasibility, other few are discussed with and to be implemented soon.

Key words:

Business process analysis, time motion, Implementation, evaluation, changes, Ishikawa /fish bone diagram, RACI analysis ,MRI department, process flow/work flow.

EXECUTIVE SUMMARY:

The MRI section of the Imaging department was thoroughly studied through business process analysis. It helped in obtaining the assessment of the process and suggest the recommendations for improvement. The study methodology included time motion data of 150 patients at two stages, firstly for investigation and secondly for evaluation. Out of several recommendations, certain could be implemented in the given time frame. Hence, they were implemented and their impact on the process in terms of effectiveness and greater efficiency was evaluated through time motion Data of same sample size i.e. 150 patients.

The changes implemented mostly dealt with the communication to the patients and based on scheduling. Some additional signboards incorporated in the department have led to improvement in the process at different fronts. Earlier, all the GA patients were being called together at 8:30 AM; Now 2 patients are called at 8:30, next 2 at 9:30 AM and rest at 10:15 AM. In addition to these, the total number of slots being booked increased to 41.

The key result is the decrease in the preparation time. The preparation time got reduced by 51.2% in case of GA cases and by 40% in Non GA cases. The idle time for the machines also got reduced in case of GA patients. The overall waiting time also decreased for 16.37 % for GA patients.

Further, the process holds the scope of improvement by incorporating other changes as well. The improved efficiency of the process will lead to higher revenue generation and enhanced patient satisfaction.

INTRODUCTION:

Business process review/ analysis is an assessment tool to identify the bottlenecks in the existing business system and the opportunities for improvement in the same. It generally comprises of three stages namely review, proposal for change and implementing change. This tool can be applicable to both simple , small level processes as well as the large and complex businesses. It provides both the 360° panoramic overview and in depth understanding of the existing system which is necessary for considering improvements. Thorough understanding of the existing system , Identification of the roadblocks/bottlenecks , Identification of scope of improvement and designing of the appropriate intervening tools, Assessment of the impact of implementing change.

The Radiology Department

The department deals with the diagnosis and treatment of disease through the use of radiography, fluoroscopy and radioisotopes. The department has facilities such as X-ray, Fluoroscopy, Ultrasound (US), CT scan, MRI and Nuclear Medicine. But large numbers of patients are seen in queue mostly in front of X-ray and US rooms. Inpatients are given priority over outpatients for investigation.

Four reasons to conduct a BPR:

1. Identify and Manage Risks –The sooner that any and all potential risks to the process can be identified, the greater the chance of successfully mitigating them. Once risks have been identified, they can be better managed.
2. Develop accurate estimates of effort –The BPR, by nature of its thoroughness and detail, will lead to a much more precise estimate of the final implementation costs.

3. Define scope of the implementation – By breaking down the various transactions and processes, the Statement of Work that follows can be very detailed as to what is and what is NOT in scope for this project.(scope of change in the process)
4. Set realistic expectations – By working closely with vital employees during the BPR, realistic expectations about the scope of the project plan, expected changes and their implementation can be identified .

Review of literature:

Business Process Reengineering is "the analysis and design of workflows and processes within and between organisations". It is the critical analysis and radical redesign of existing business processes to achieve breakthrough improvements in performance measures.

Davenport and Short define business process as "a set of logically related tasks performed to achieve a defined business outcome." A process is " a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organisation" . In health care 'Processes' are defined as "a group of functions that result in a whole output to the patient, not necessarily a whole service".

One of the key success factors for reengineering in health care will be to redefine the organisations in terms of process and the organisation of people will need to enable these processes.

A business process that describes the day-to-day activities and job duties an employee performs. (Job duties = processes)

A business process is a picture of workflow/processflow with a beginning, middle and end.

Work often crosses over departments. BPR requires cooperation and a willingness to assess the ownership of duties/tasks.

Business process management (BPM), business process review (BPR), and business process innovation (BPI) have been the primary strategies adopted by several organisations to manage their business successfully . In the last few years, the concept of BPM, BPR, and BPI has been a hot topic among the hospital industry, which is evident in the degree of literatures devoted to it.

Business process modelling is an essential part of understanding and redesigning the activities that a typical enterprise uses to achieve its business goals. The quality of a business process model has a significant impact on the development of any enterprise and IT support for that process.

PROJECT/STUDY:

The imaging division of the Hospital comprises of MRI, CT Scan , X Ray, Mammography, Colour Doppler, Fluoroscopy, Ultra- sonography, DSA (Digital subtraction angiography), BMD (Bone mineral densitometry), Nuclear medicine (PET-CT/SPE-CT) and Interventional radiology . Magnetic Resonance Imaging (MRI) is a non invasive diagnostic technique that uses a magnetic field and radiofrequency waves to create the images of the human body across different planes thereby providing thorough high resolution images helping doctors in diagnosis. MRI is commonly used for diagnosis of brain tumour, stroke, epilepsy, multiple sclerosis, spinal deformity, breast cancer and deafness.

The aim of the business process analysis of the MRI department was to achieve the following expected outcomes:-

- Thorough understanding of the existing system
- Identification of the roadblocks/bottlenecks
- Identification of scope of improvement and designing of the appropriate intervening tools
- Assessment of the impact of implementing change

Purpose and Scope of the Project

The purpose of this project was to conduct the business process analysis of MRI section, Department of Imaging, P.D. Hinduja Hospital and Medical Research Centre and to assess the impact of changes implemented.

This project included all the three stages of business process analysis and additional-

ly assessed the implemented changes intended for improvement of the existing business process.

Methods and Sampling:

The project undertook the Time motion study of 150 patients both at the investigative and evaluative stage. Other methodologies used were work shadowing, observation and interview with the stakeholders namely front desk staff, technologist, radiologist, nursing staff , support staff and patients.

Study location: This study was conducted in P.D. Hinduja hospital & MRC ,Mumbai.

Study subjects: Patients, nurses, technicians & doctors

Results/Findings: Process Review The review of the MRI department was understood using the work shadowing and the following workflow was determined:

Figure 01: The diagrammatic view of workflow in the MRI department

IN SEQUENCE:

Waiting area

Registration desk

Changing room

Waiting area

Nursing station - Pink

MRI Room -

Doctor's room

Technical Room

Console room

The flowchart of the workflow in the MRI department :

- Appointment taken- slot allowed
 - Patient arrival
 - Consent form filling, checklist marking, and making payment
 - Preparation(in case of GA/Contrast study)
 - Dress change
 - Patient history taken(MRI request form is used)
 - Stay in waiting area
-
- MRI examination(preceded by technician's and instructions and setting time taken)
 - Receiving time

The key findings about the functioning of the department were as enumerated below:-

- ▪There are two machines of different strengths namely 1.5Tesla and 3Tesla

- ▪The scheduling is based on 45 minutes long slots

- ▪The GA (General Anaesthesia) cases are proceeded between 8:30 AM to 1:00 PM

- ▪The prior appointment system is in place for booking of the slots ; however walk in patients are also accepted depending on the availability

- ▪The working duration is from 7:00 AM to 11:00 PM

- ▪Among the resources , 2 patient trolleys are used for preparing the patients as well as the recovery after GA

- ▪For appointment, scheduling and payments, a module of CARE 2000 is used as part of the Hospital's Information System (HIS). During appointment details that are filled are namely Patient no. (HH No. /EX NO.), Name, Telephone Number, Service provided (based on the prescription submitted) ,Sex/ age ,Time allotted, Status like tentative (yellow), confirmed (red), purple , light blue (available), pink (holding) , grey (OT book), Remarks (any further specifications)

- ▪Instructions are conveyed to patients orally as displayed on the desktop screen

- ▪The record files that are maintained – inventory of medicines and consumables (weekly indent) , post anesthetic care (recovery room data), crash cart , working of suction and O2 supply , pharmacy enquiry (to be charged separately from the patient), contrast checking , thermometer checking , daily consent forms record, anaesthesia charge sheet

➤ ▪Claustrophobia or other unprecedented factors making patient uncomfortable delays the scan time

➤ ▪Patient seems highly dissatisfied due to long waiting time

➤ ▪Real time communication is missing to patients' relatives

➤ ▪Patient flow is not uniformly distributed over different time of day and across days in a week

➤ ▪For every patient, one folder is used for keeping report; a sticker with the patient details is printed and pasted on it.

➤ □The number of staff present in a shift – 2 technicians, 1 resident radiologists, 1 nurse , 1attendant , 2 registration desk staff

➤ ▪Working hours : for technicians & registration staff – 7 to 3, 3 to 11

➤ ▪For nurses – 8 to 4, 2 to 10 (reliever from CT scan dept from 2 to 4

➤ ▪Pager system for nursing and attendant staff (only used in emergency)

Process Map:

The process map(appendix-01) created henceforth provided the thorough description of the functioning of the department.

Time Motion Study - Investigative Stage:

The time motion study of sample size 150 revealed the possible gaps and the reasons for those gaps. The most evident problem in day to day functioning was the overshooting of the 45 minutes duration of the slot allotted to a patient. The study reflected that among 150 patients for 56% of the cases the duration did overshoot on an average by 59 minutes while rest of the 44% remained within the duration of 45 minutes with an average of 35 minutes scan time.

The quantitative results are summarised in the following table:-

TIME TAKEN FOR MRI SCAN

PARAMETER	GA CASES	NON-GA CASES
Average MRI examination time (time taken for 1 scan)	46 minutes	51 minutes
Average turn around time(time taken for 1 patient's arrival to his exit)	193 minutes	104 minutes
Average preparation time(time taken to prepare a patient for scan)	41 minutes	35 minutes- OPD 13 minutes- IPD
Average recovery time	49 minutes	
Average idle time	12 minutes	8 minutes
Average waiting time	116 minutes	80 minutes

Table: The tabular format summary of the quantitative analysis conducted

Average no of examination per day	31 examination
Average working hours per week	96 hours
Average access time(time duration between appointment request and allotment	1 day (variability 1 to 22 days)
% IPD cases	16%
% OPD cases	84%
% walk in appointments	7.6%
Utilization rate(average 31 cases out of 40 planned cases)	77.5%

20Table: The tabular format summary of the quantitive analysis conducted

The gaps in the process were identified using cause & effect analysis (Fish bone/Ishikawa diagram) and RACI analysis (Responsible, accountable, consulted and informed) as discussed in further section.

The qualitative (cross-sectional) analysis in which each step of the process flow that the patient goes through was examined explained the possible reasons for the gaps which is summarised as followed:-

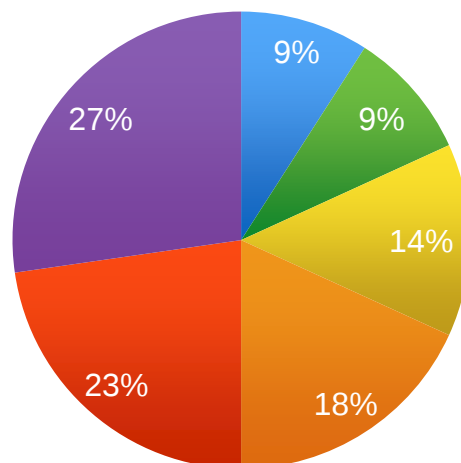
Problem #1

Definition: Delay may occur depending on if the patient arrives late or early

Metric: 24% patients come later than the time allotted with an average delay of 17 minutes. 24% patients come before allot

Analysis: At the time of patient's arrival following situations may differentiate the time lag Solution: the patients asked to arrive 15 minutes before the scheduled allotted time.

- Dresses not available in changing room
- size not available
- Changing room occupied
- Not in stock
- Attendant not available to provide dress
- very old immobile patient



PATIENT ARRIVAL

Figure 1: Causes of delay in patient arrival

Problem #2

Define: At the time of process carried at the registration desk, longer time is taken

- patient arrives late
- prepond
- emergency cases

than required.

Metric: on an average time spent for completing paperwork, 14 minutes are taken on each patient with an average deviation of 2 minutes. For payment in 4% cases patients or their relative go out for cash withdrawal. For 2% cases, some issue with third party occur and delay happens.

Analysis: Following reasons were identified for delay

Solution: For the registration, all the forms are being clubbed together for faster completion of paperwork.

INTERACTION AT REGISTRATION DESK

Figure 2: Causes of delay at registration desk

Problem #3

Define: When patient goes to changing room, some factors may lead to delay Metrics: there might be several reasons that it contributes to delay and increases the machine vacancy time in certain cases

Analysis: Following reasons were noted for the same

Solution: All the patient dresses being kept in the stacked order in the changing room and additional signage were put to self direct the patients what to be done next.

CHANGING ROOM

Figure 3: Causes of delay in changing room

Problem #4

Define: At the time of preparation of patient for MRI exam, certain reasons cause delay
Metric: On an average 4 minutes are taken for the preparation but high variability to 7 minutes in cases of GA patients

Analysis: Following reasons are identified to be the cause

Figure 4: Causes of delay i preparation of patien

Solution: Amongst GA patients, 2 being called at 8:30 AM, next 2 at 9:30 AM and rest the

Problem#5

Define: Unfixed timing for taking patient history and other requirements may delay the patient's scan

Metric: On an average 4 minutes are taken for patient history with average deviation of 2 minutes
Analysis: Following causes were identified for delay at this step.

Solution: No suggestion was recommended.

PATIENT HISTORY

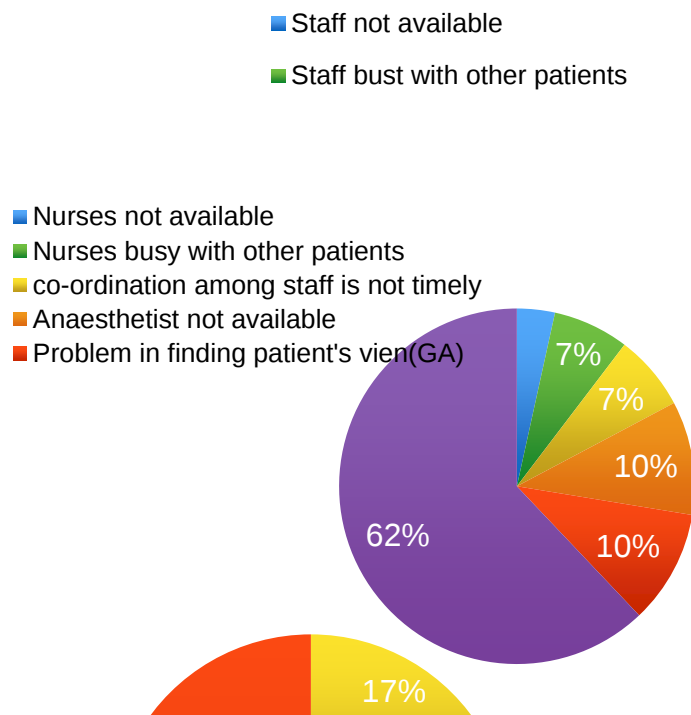


Figure 5: Unfixed timing for taking patient history

Problem # 6

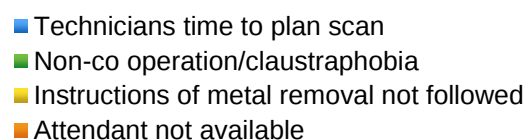
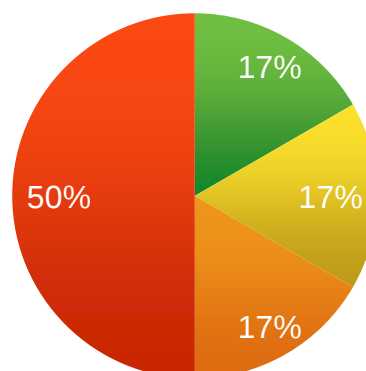
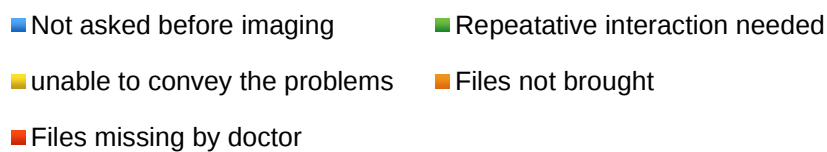
Define: At the time of setting the patient for exam/MRI scan, certain causes create unnecessary delay
Metric: On an average 4 minutes are taken with the average deviation of 2 minutes

Analysis: Following reasons were identified to contribute to delay

Solution: Poster signboard about instructions of removing metal items placed in the changing room.

SETTING TIME

Figure 6: Causes of delay due to setting time of scan



Problem #7

Define: The scan time does not always fit in the predefined fixed slot of duration of 45 minutes
Metric: On an average 50 minutes it takes with average deviation of 16 minutes

Analysis: The following causes were identified to contribute to any delay

Solution: Number of slots increased from 38 to 41. Earlier average number of slots booked for both OPD and IPD were 31.

SCANNING

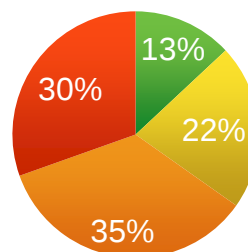
Figure 7: Causes of delay in scanning

Problem # 8

Define: At the time of completion of MRI exam, the patient may have to wait for getting IV removed or for recovery purpose.

Metric: On an average, in case of GA, for recovery 44 minutes are taken while the average discharge for other patients is 8 minutes including time taken to change

Analysis: The following reasons be responsible for the same
Solution: No recommendation was suggested.



IV REMOVAL/RECOVERY

Problem # 9

Define: At the time of discharge, patient takes longer due to certain reasons

Metric: The waiting time for such causes may extend on an average up to 8 minutes with an average deviation of 8 minute.

Analysis: Such delay is due to following factors

Solution: To decrease the report collection enquiry and ease of patients, report collection information displayed at registration and in the waiting area.

EXIT

Figure 9: Causes of delay in exiting after scan from the department

Implementation of Change:-

Several recommendations have been put forward for the improvement of the department as discussed further in the section of Recommendations. Based on the time constrained feasibility, a few could be implemented as shown below and their impact could be studied through evaluation as explained further.

- Nurses not available
- Nurses busy with other patients
- Instructions not followed to press for 5 minutes
- Nurses busy with her own errands

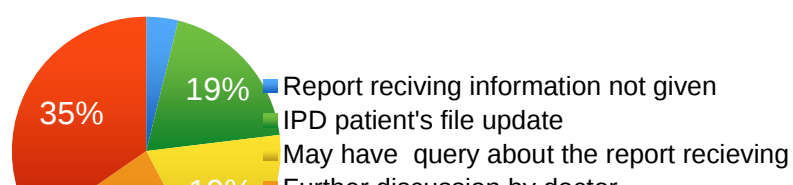




Figure: The signage placed near the bin in the changing room



Figure: Additional signage directing patients from the changing room

GREEN ADULT GOWN	GREEN ADULT PYJAMA
GREEN SMALL GOWN	GREEN SMALL PYJAMA
WHITE ADULT GOWN	WHITE ADULT PYJAMA
BED COVERS	PILLOW COVERS
BLANKETS	PATIENT LOCKER

Figure: The labels for the shelves in the changing room



Figure: poster for instruction of removing metal items



Figure: The report information signage displayed at the notice board at the registration counter

The problems, their relevant solution and the impact of the solutions implemented are summarised

below:

Problem	Before implementation	Solution	After implementation
Patient coming late	24% patients	called 15 minutes before appointment time	
Longer time for registration	Average time duration for registration was 14 minutes	Clubbing together of forms	overall registration time decreased by 51.2% in GA cases and by 40% in non-GA cases
Delay in changing into the patient dress	Less information to the patients. Very few dresses kept in changing room	All patient dresses kept in changing room signboards directing patients displayed	TAT for non GA decreased by 5.67%
Preparing the patient for MRI	GA patients whose turn is later had to wait ver long	Calling 2 GA patients at 8.30,next 2 at 9.30 and rest at 10.15	TAT for GA patients decreased by 16.58% and waiting time also decreased by 16.37%
Patient history	No fixed order for few incidences,this caused delay	No suggestions	
setting the patient on patient table	Average time taken is 4 minutes	To avoid delay due to not following instruction, poster for metal removal placed in changing room	Overall preparation time decreased by 51.2% in case of GA , in case of non-GA by 40%
Scan time exceeding by 45 minutes	Average duration was 50 minutes	Slots increased to 41 pushing efficient & faster processing	Examination time almost same

Delay after scan is complete	Many reasons responsible	No suggestions recommended	
Delay in discharge	Enquiry or other reasons	Report collection information placed	Idle time for machine decreased by 25%

Table:The problems, their relevant solution and the impact of the solutions implemented are summarised

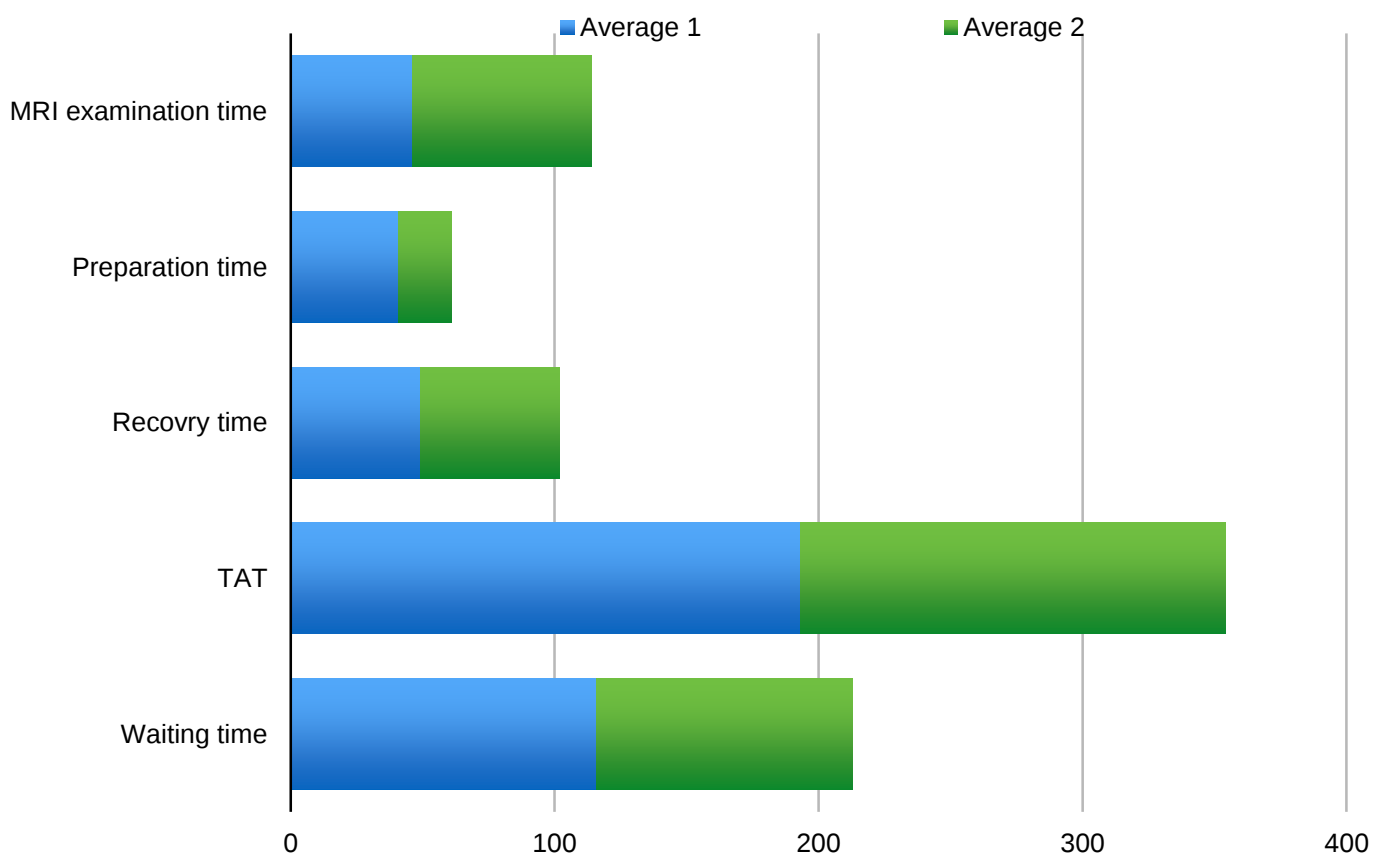
Time motion Study- Evaluation Stage:-

The evaluation part was carried out with the same sample size of 150 patients and the comparative analysis was done. The results are summarised in the chart and described in table as followed:

COMPARATIVE STUDY FOR GA CASES:

X axis = time (in minutes), Y axis = process/task

FIGURE: COMPARATIVE DATA FOR GA CASES



MRI examination time: More cases of MRI brain than other smaller studies

PREPARATION TIME: Significantly got decreased by 51.2%

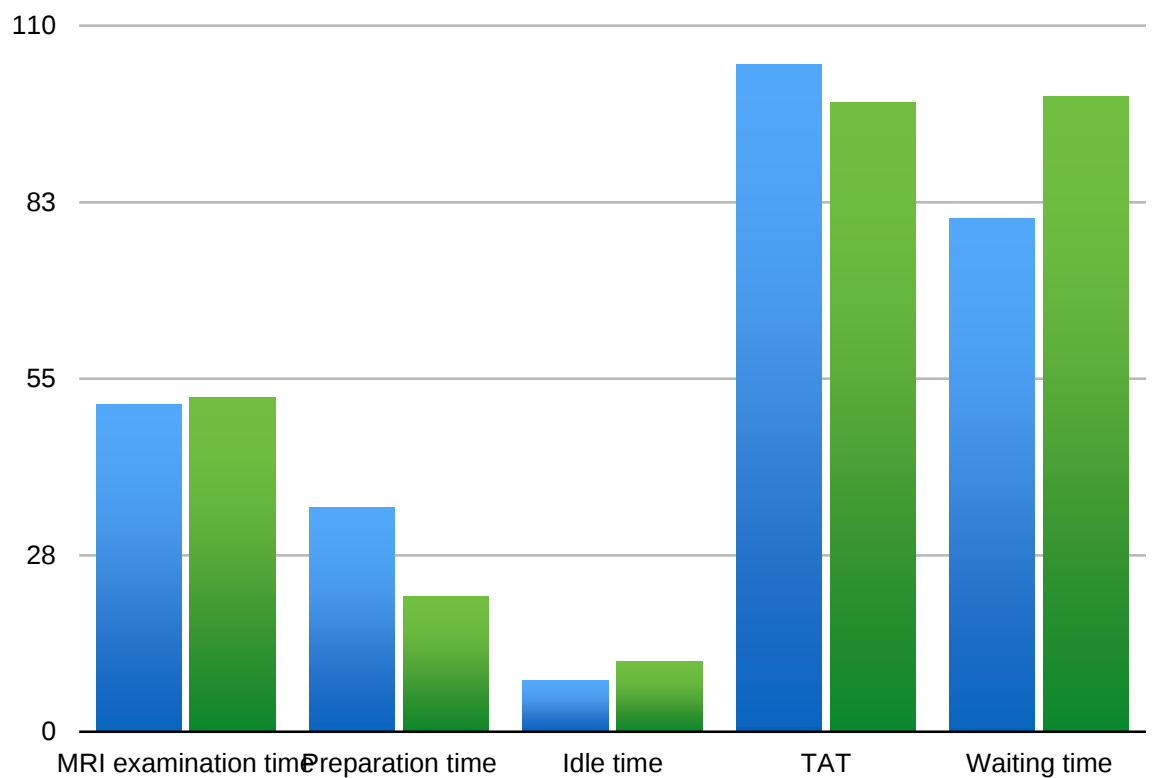
RECOVERY TIME: Was more than earlier reason is patient specific

IDLE TIME: Decreased by 25%

TAT: Got decreased by 16.58% probably due to decreased in preparation time and idle time

WAITING TIME: Got decreased by 16.37%

COMPARATIVE DATA FOR NON-GA CASES:



X axis = process/task

Y axis = time(in minutes)

MRI examination time: is almost similar

Preparation time: Significantly decreased by 40%

Idle time: Was increased by 37% which was due to less patient flow on certain days of the study which led to higher vacant time

TAT: Decreased by 5.7% due to reduction in preparation time.

Waiting time: Increased by 23.75% due to higher number of walking patients(seasonal impact)

Certain findings based on the observation and discussions with staff during the evaluation stage are:-

- ▪Attendant had to be asked to keep patient dresses in changing room. some of them needs to be more responsive to the patient needs
- ▪Scheduling becomes difficult if many walk in patients are there- longer waiting time for them and more clarity required in communication between technician and front desk staff in this regard.
- ▪Once ventilator was found to be not working properly when patient had been already taken for MRI – maintenance should be more robust to avoid such incidences
- ▪Sometimes no staff is present in waiting area
- ▪In certain instances , scan could not be done ; reasons were metal stents inside body, no

fasting before GA (ICU patient) , patient could not lie down comfortably

➤ ▪Some days both the machines were vacant for more than 30 minutes owing to less patient flow

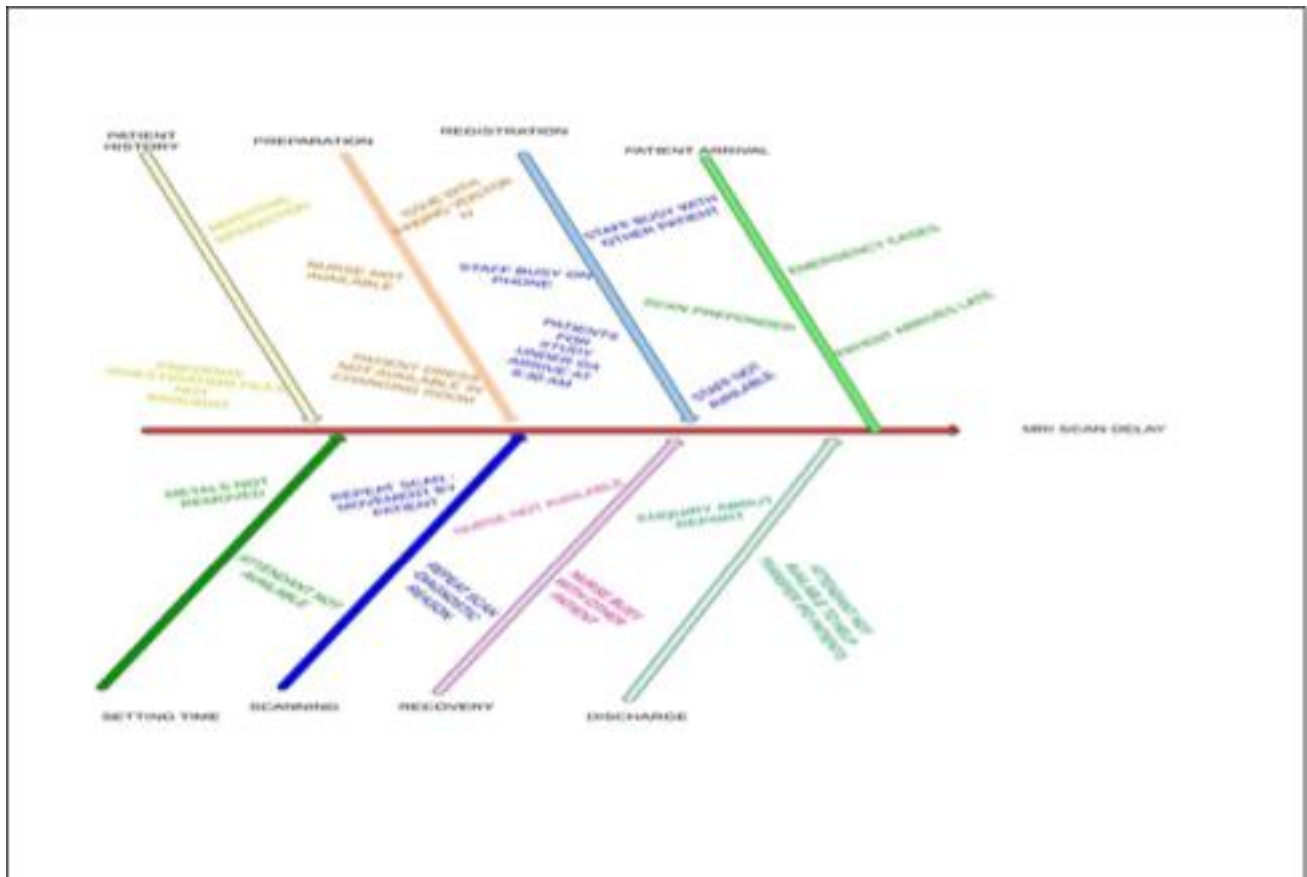
➤ ▪Number of lockers given for patients' use be increased to 4 instead of 2

➤ ▪Absence of billing staff makes the patients go to the first floor for payment specially during lunch breaks ; probable reason is shortage of staff

Discussion & Analysis:

Cause & Effect Analysis:

With the help of the Ishikawa diagram shown below the key weak links that need to be addressed for the improvement of the process are identified



The analysis reflected where the efforts for improvement be directed for the maximum effectiveness as mentioned below:-

➤ ▪The regis

➤ ▪The change in schedule for GA cases can help reduce the waiting time for those arriving at 8:30 AM

➤ ▪Absence of staff for certain time period had been observed

➤ ▪Delay had been caused due to the non availability of patient dresses in the changing room

➤ ▪Some patients did not bring previous investigation files / reports. This indicates towards improper conveyance of instructions

➤ ▪Some patients were observed not to remove the metal items as directed; at the time of scan it caused delay in initiation of the procedure.

➤ ▪For some patients , scans were to be repeated owing to the blurred images due to movement or some other reason

➤ ▪Frequent enquiry about the report had been observed

RACI Analysis

The RACI analysis carried out for the actors involved in the process revealed the following results:-

	Receptionist	Nurse	Technician	Resident Doctor	Anaesthetist	Attendant	Radiologist
Responsible	5	6	3	1		4	1
Accountable	1	1	5			4	
Consulted	2	0	6	1	4		1

Informed	3	5	5	3	1		
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For the analysis, the functions or roles were evaluated across the RACI (responsible, accountable, consulted and informed) parameter for each actor and the frequency of the parameters were cumulated together as shown above. The implications of this analysis are as given below:

- ▪workload can be redistributed and load be less for technician & nurse (during GA cases)

- ▪for technician , consulting and informed tasks can be reduced

- ▪for nurse , informed tasks can be reduced

- ▪similarly , receptionist is loaded with the responsible category tasks

This result points towards the requisite changes with respect to the role of human resource which can be adopted effectively in the overall process improvement.

Conclusion:

- ▪The project undertook the analysis, implementation and evaluation

- ▪The analysis part led to the thorough understanding of the business process and identification of the existing gaps

➤ ▪The implementation (research, design and approval) is an ongoing process ;
only certain
recommendations could be implemented due to the time constrained feasibility

➤ ▪The implemented changes that were confined to the front desk , guiding the
patients through signage and scheduling changes showed the reduction in time spent
for preparation , waiting time
for GA patients and idle time for the machine.

RECOMMENDATIONS & CORRECTIVE ACTION PLAN

The recommendations for the process improvement besides those already implemented are tabulated as given below:

YET TO BE DISCUSSED	
TO BE IMPLEMENTED SOON	
ON HOLD	
IMPLEMENTED	

STATUS	SOLUTION	PROBLEM
	• Stacks labelled • All patient dresses kept in changing room	Dress not available at times because only one piece is kept at a time
	3 additional sign boards displayed	Directive communication for patient is missing in changing room
	Poster to inform removal of metallic things	Patients may not be clear about removal of all metallic items
	Notice for repost collection information	Many enquiries about report collection
	3 forms in total clubbed together (consent form,scan request form,MRI checklist) as different sets	Delay in arranging and sending consent and request forms
	2 patients called at 8.30 am,next 2 at 9.30 am,rest at 10.15 am onwards. Number of slots increased to 41	All GA patients arrived at 8.30 am
	Calling patient 15 minutes before the allotted time	Some patients get delayed in arriving - currently patients called 15 minutes before
	On the checklist, to be mentioned who is informed about the patient next in turn	Communication needs to be more efficient between technician,doctor and front desk staff
	Feedback form to be created for radiology department(as already used in health check & OPD)	Feedback forms for any complaints and complaints from patients.
	Job enhancement-task of patient been set on patient table done by attendant.	Technician being involved in patient care-leads to additional delay
	SOPs for all staff be displayed on notice board inside console room(for their own reference)	Clear description of work can help staff be organised
	Brochures to be given at the time of appointment	Need of making patient more informative
	Motivating rewards and professionalism enhancing learning session for staff	Co-ordination between the staff holds possibility of improvement and occasional friction

		tions can be avoided
	Standardise duration of waiting,excess time say not more than 30 minutes,2 days respectively	For some patients very long waiting time(specially walk-in without any reference)
	All scheduling being done by single person	Certain times scheduling itself is not proper due to mis-communication(OPDs handled by registration,& IPDs handled by technician directly)
	Preference based on urgency of the condition and need of the patient	Certain patients need appointment urgently
	Audio-visual to be screened in the waiting area All the information content in brochure and demo videos be uploaded on website	Patient needs to be mentally well prepared to increase the possibility of co-operation during MRI scan
	Use of RFID system and other technological support for tracking inventory(linen,drugs& other medical supplies)and staff	Real time communication among staff can be improved with technological interventions

REFERENCES

- “Introduction to business process review and implementation”; cics-ppu@sheffield.ac.uk
- “ The business process review”, Pennington Dennis P. , Total resource Management

APPENDIX-01 PROCESS MAP

