

DISSERTATION PROJECT AT



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Roll No. : 1342(HOM, 2ND YEAR)

Under The Guidance of :

Dr. Mamta Chauhan, Professor at IIHMR
University



ORGANIZATION PROFILE

- One of India's major corporate healthcare organizations, with facilities in Telangana, Andhra Pradesh, and Maharashtra offering multi-disciplinary integrated healthcare services.
- Dr. Bhaskar Rao Bollineni,-Founder and Managing Director
- KIMS Hospitals, Secunderabad :Flagship hospital ,one of the largest private hospitals in India at a single location with a capacity of 1,000 beds.
- First hospital : Nellore, opened in 2000 with capacity of 200 beds.
- Provides comprehensive healthcare services in over 25 disciplines and super specialties, including cardiac sciences, oncology, neurosciences, gastroenterology, orthopedics, organ transplantation, renal sciences, etc.





- To be the most opted healthcare services brand by offering people with affordable treatment and the finest clinical outcomes.



- Providing inexpensive quality care to our patients through patient-centric systems and processes.
- Enabling clinical outcome driven excellence through the use of current medical technology and providing a strong motivation for doctors to pursue academics and medical research.



- Patient is paramount
- Take pride in what they do
- Act with transparency and integrity
- Compassion - They are sincere, caring, courteous, and understanding

**PROJECTS
UNDERTAKEN
IN KIMS**



MRI Scan TAT & Gap Analysis- KIMS Hospital ,Secunderabad



MRI Scan TAT & Gap Analysis- KIMS Sunshine Hospital.



Corporate Discharge TAT- KIMS Hospital, Secunderabad



Live Discharge Tracking-KIMS Sunshine Hospital.



Insurance Discharge TAT- KIMS Sunshine Hospital.



Ultrasound Process Observation- KIMS Hospital, Secunderabad.

MRI SCAN GAP-ANALYSIS

TITLE: “Improving MRI Scan Turnaround Time for Enhanced Patient Care: A Quality Improvement Initiative” in KIMS Hospital, Secunderabad , Telangana- An observational Study.

INTRODUCTION:

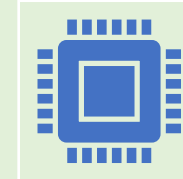
- **MRI:** Healthcare Providers To Evaluate, Diagnose & Monitor Various Health Conditions. Quality Is The Ability & Potential To Deliver Results In A Fair Amount Of Time Without Compromising Accuracy.
- Turn Around Time (Tat) Is A Measure Of Quality Of Services Rendered.
- Here, Tat Refers To The Time Interval Between Completing The Mri Scan Of One Patient (Patient A) And Starting The Next Mri Scan For The Next Patient (Patient B).
- Tat And Patient Waiting Time: Critical Aspects; Affect Patient's Experience & Satisfaction. Long Waiting Times Can Lead To The Reduced Footfall Of Patients In The Hospital.



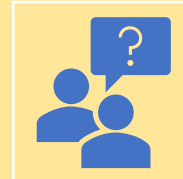
RATIONALE OF STUDY



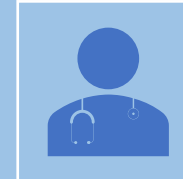
To assess the efficiency of the MRI scan process.



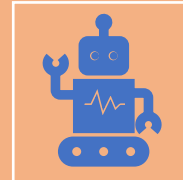
To identify the gaps leading to process delays & inefficiencies ; provide relevant solutions to improve TAT.



TAT has detrimental influence on patient treatment, lengthy wait times cause anxiety, discomfort & decreased patient satisfaction.



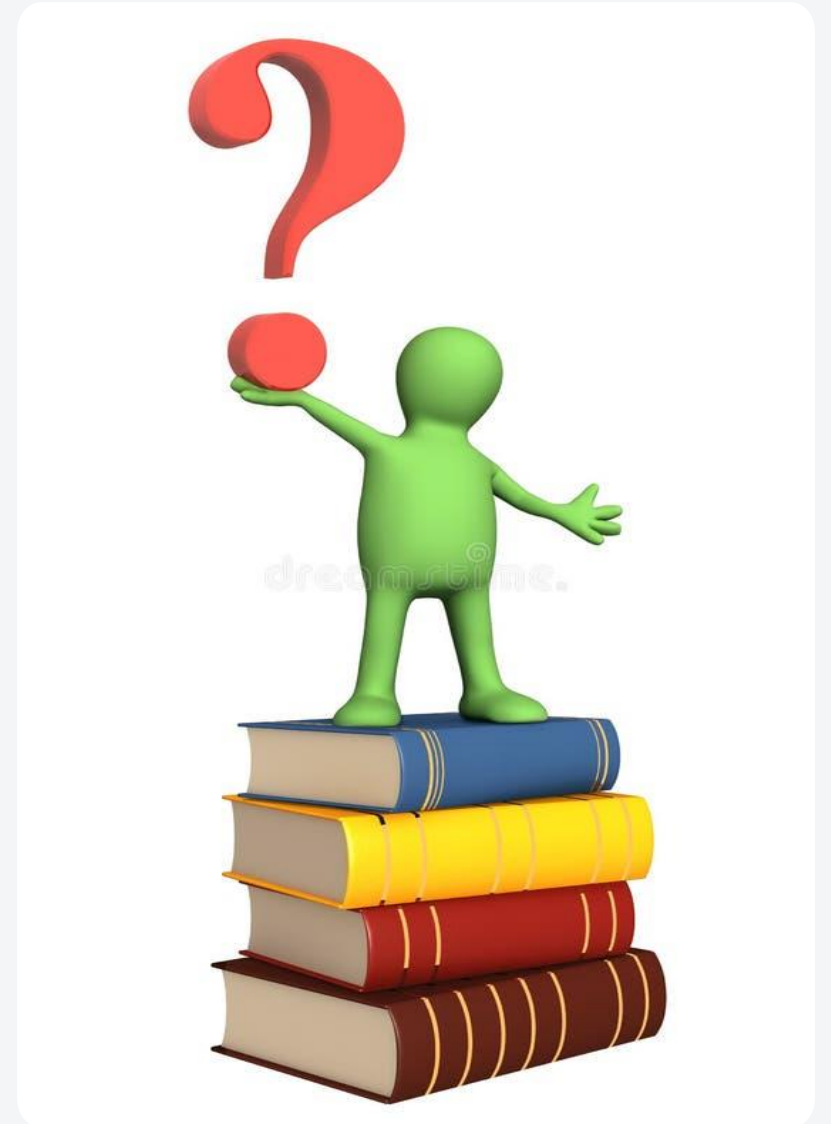
Delays can influence overall efficiency by increasing expenses for patients.



TAT Improvement assists healthcare professionals to optimize resources, improve patient care & lower total cost.

RESEARCH QUESTION

1. What is the Turn Around Time for MRI Scan at radiology department at KIMS Hospitals, Secunderabad?
2. What are the factors associated with increased time duration of scans, increased waiting times and delays?
3. How can the factors causing delay be optimized to improve the efficiency of MRI scanning process?



AIMS & OBJECTIVES

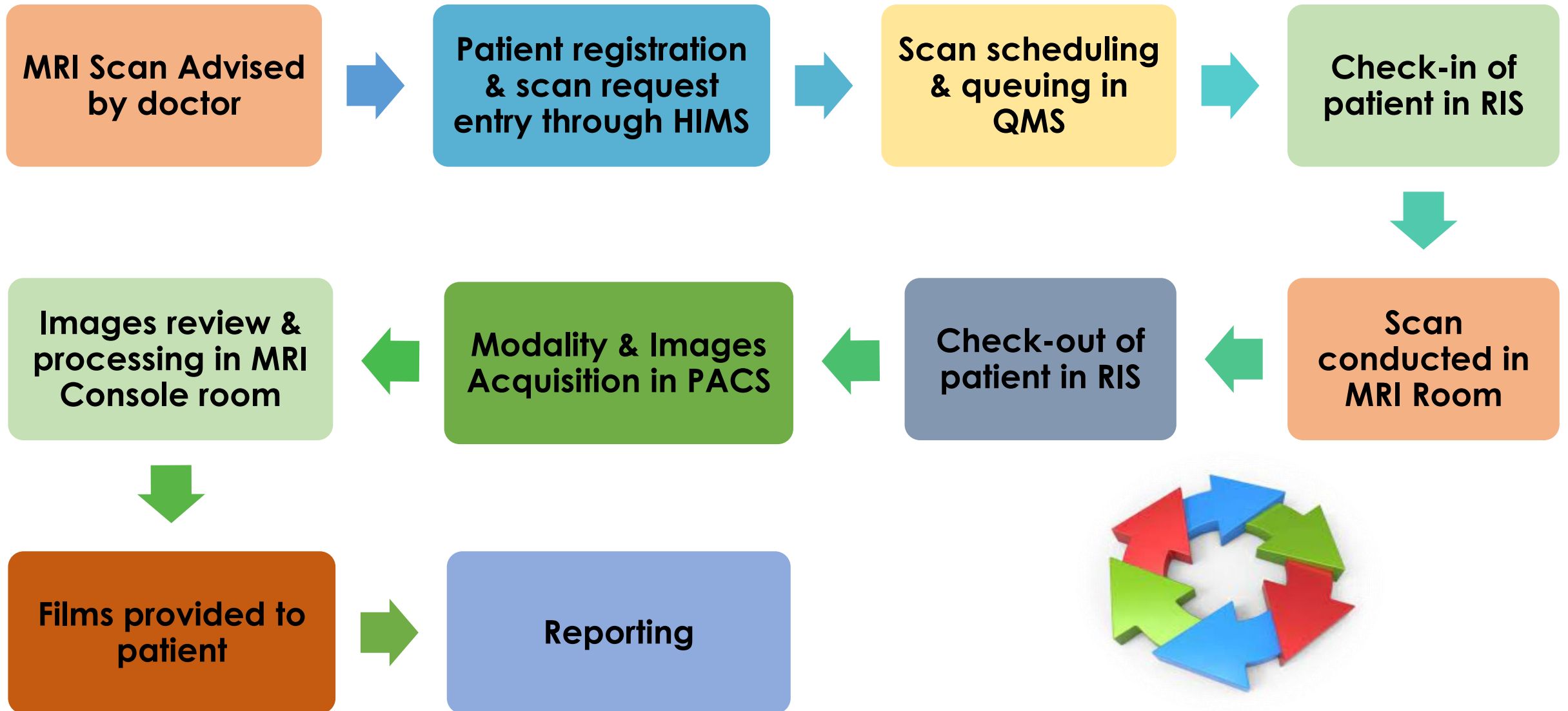
To evaluate the existing turnaround time for MRI scan and locate any workflow bottlenecks or inefficiencies in the imaging department elements that affect the turnaround time for MRIs.

To conduct a gap analysis and identify areas for process improvement to expedite MRI turnaround times, increase patient volume, and enhance patient satisfaction.

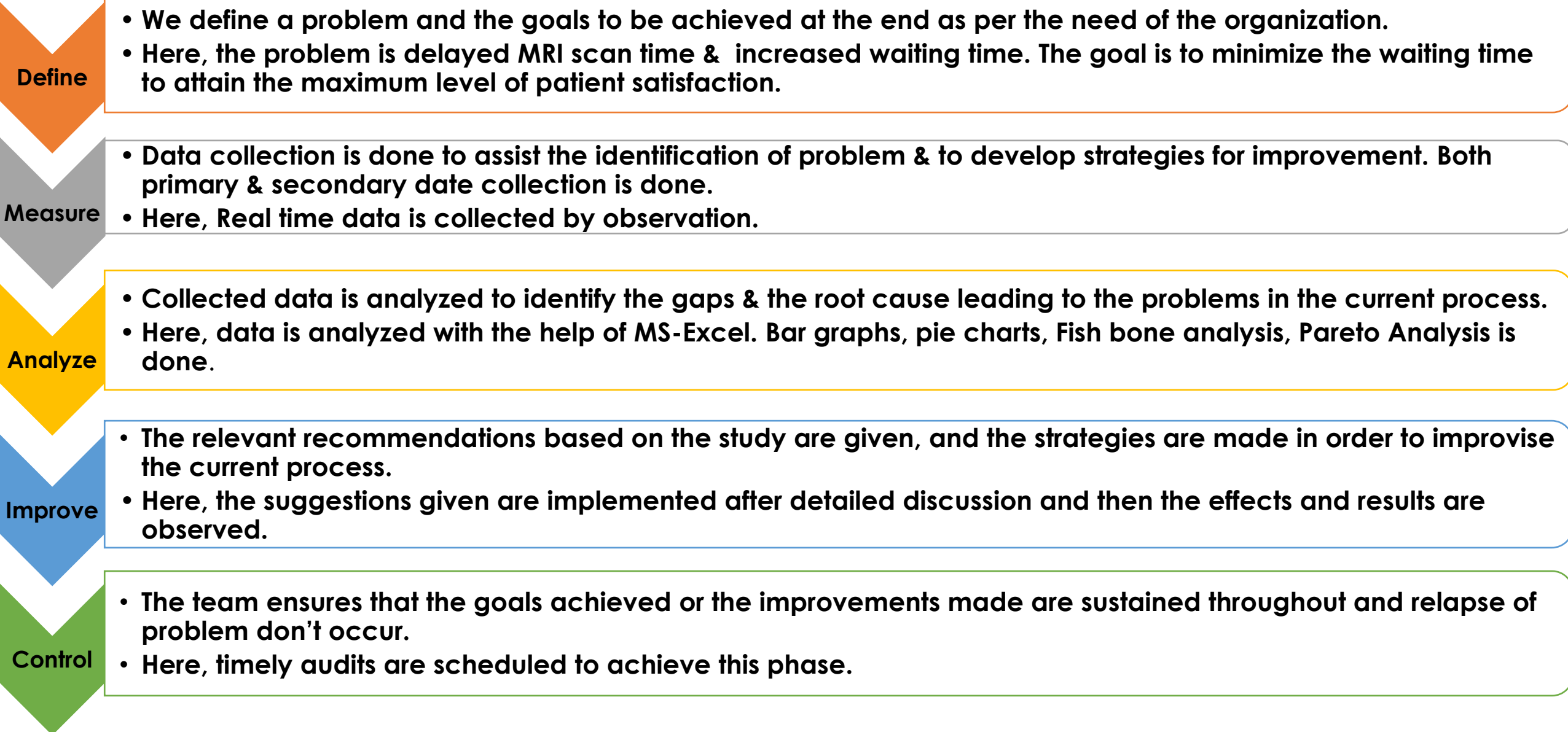
To assess the cost-effectiveness and ensuring the optimum and efficient utilization of resources- staff, machines and equipment by looking at the number of patients served per machine and comparing it with the scan time.

To provide recommendations based on the findings of study that can help KIMS Hospital to optimize its resources, reduce costs, and enhance patient satisfaction by improving MRI turnaround time.

PROCESS FLOW OF RADIOLOGY (MRI) DEPARTMENT



LEAN SIX SIGMA



METHODOLOGY

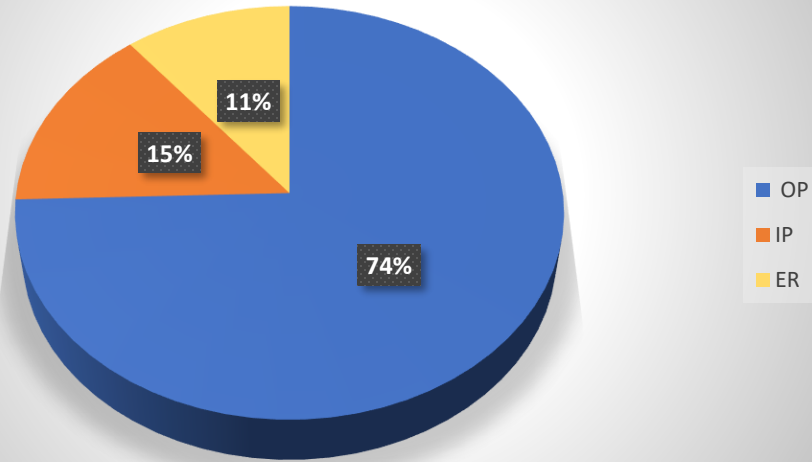
- **Study Design:** Observational cross-sectional descriptive study
- **Setting:** Radiology department at KIMS Hospitals, Secunderabad, Telangana.
Radiology department at KIMS Sunshine Hospitals, Paradise, Telangana.
- **Study Population:** Patients on machine 1.5T and 3T for KIMS Hospitals Secunderabad & patients on 1.5T for KIMS hospitals paradise.
- **Inclusion Criteria:** All the OP & IP patients visiting the radiology department for MRI during daytime.
- **Exclusion Criteria:** Anesthesia cases, Patients during night hours, pregnant women, special or VIP Cases.
- **Study Tools:** Primary data collection by direct observation of In-time & Out-time. Data Analysis done with the help of MS Excel. Secondary data collection from PACS, QMS.
- **Duration of Study:** 3 Months i.e., from 27th Feb,2023 to 27th May,2023
- **Sample Size:** 200 Patients visiting the Radiology department for MRI Scan. (100 each from Secunderabad & Paradise unit)
- **Sampling Technique:** Systematic Random Sampling

OBSERVATIONS, DATA ANALYSIS & INTERPRETATION

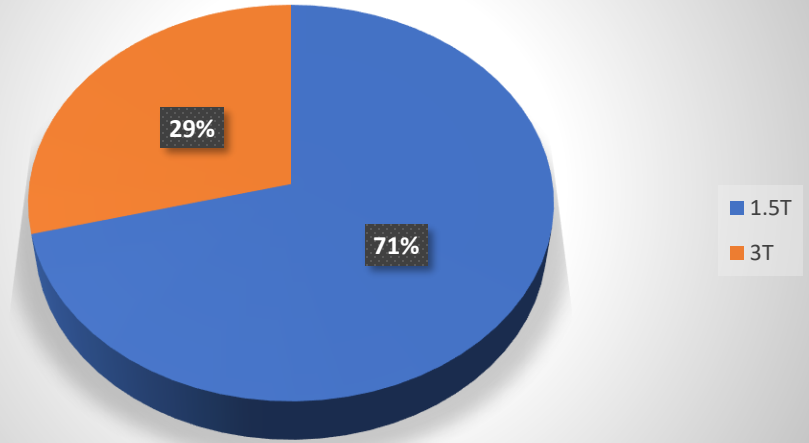


MRI- SECUNDERABAD

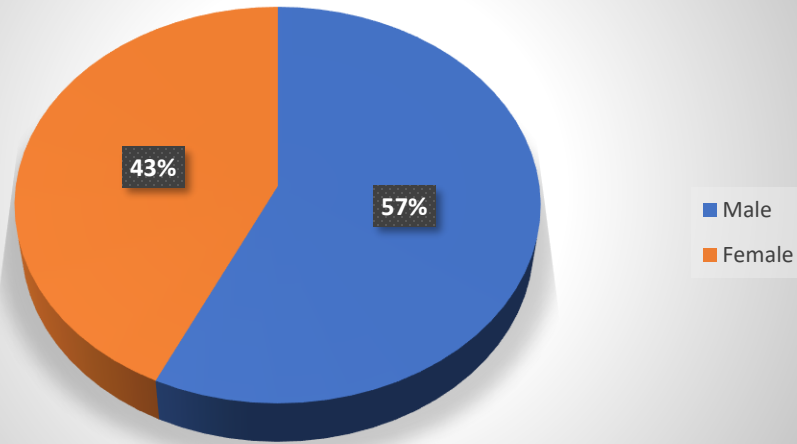
OP/IP/ER



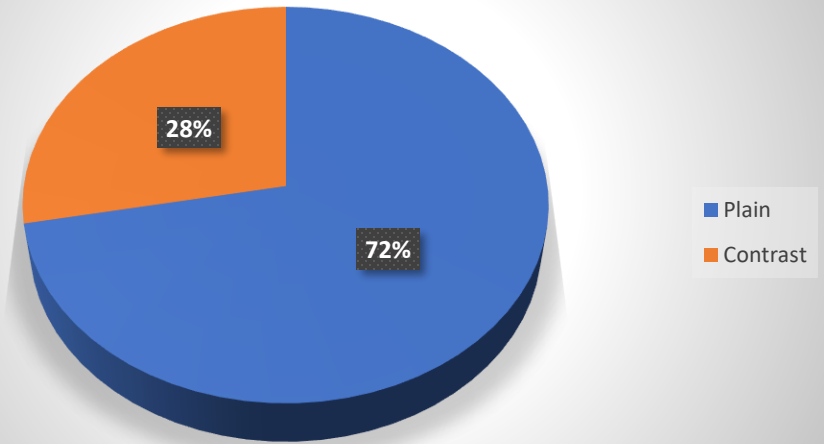
3T/1.5T

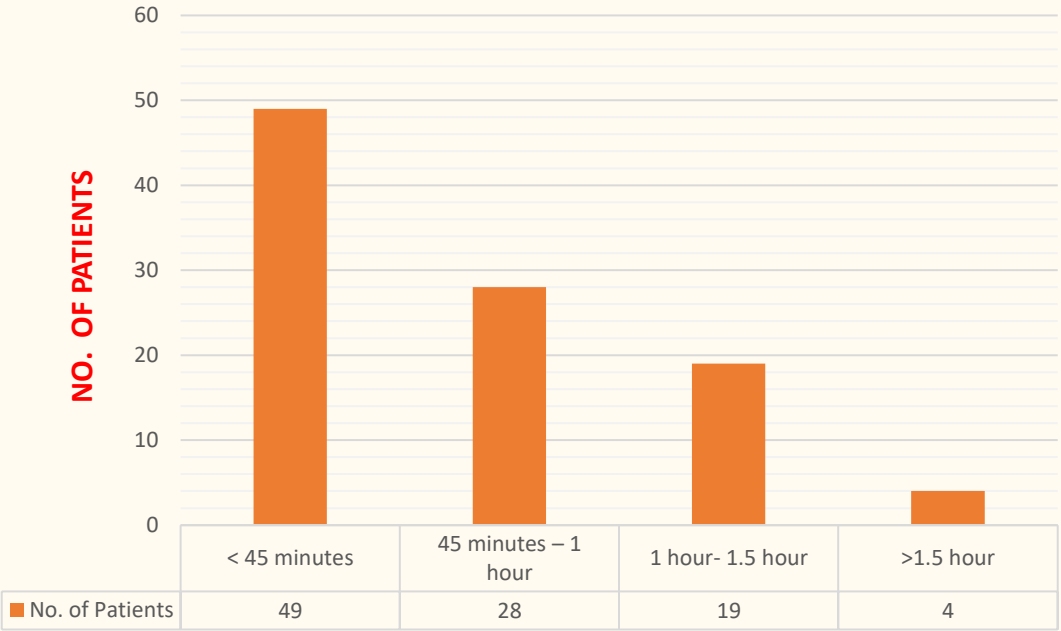
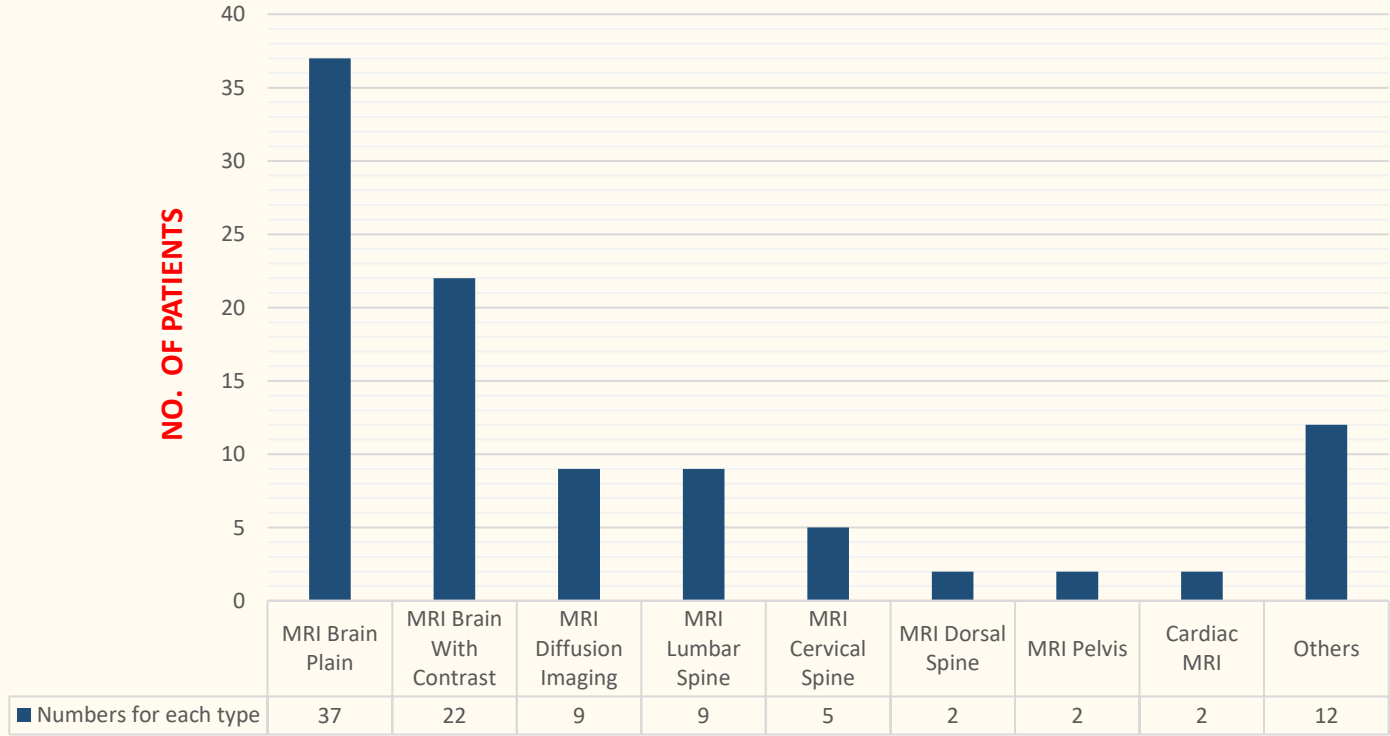
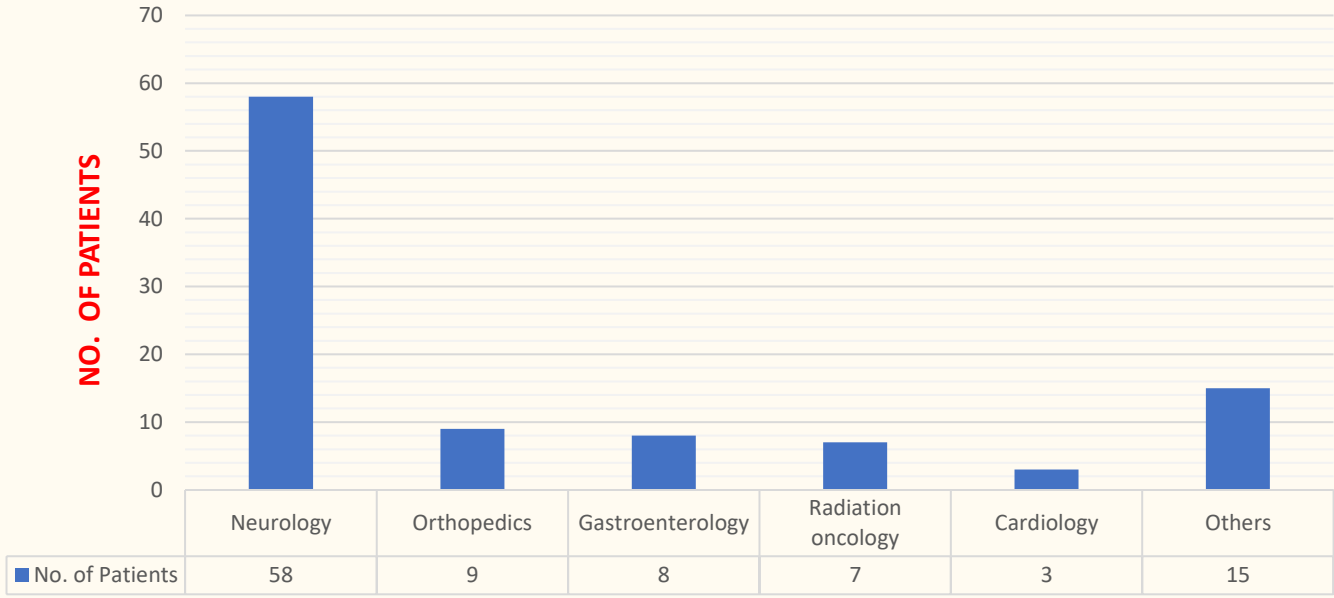
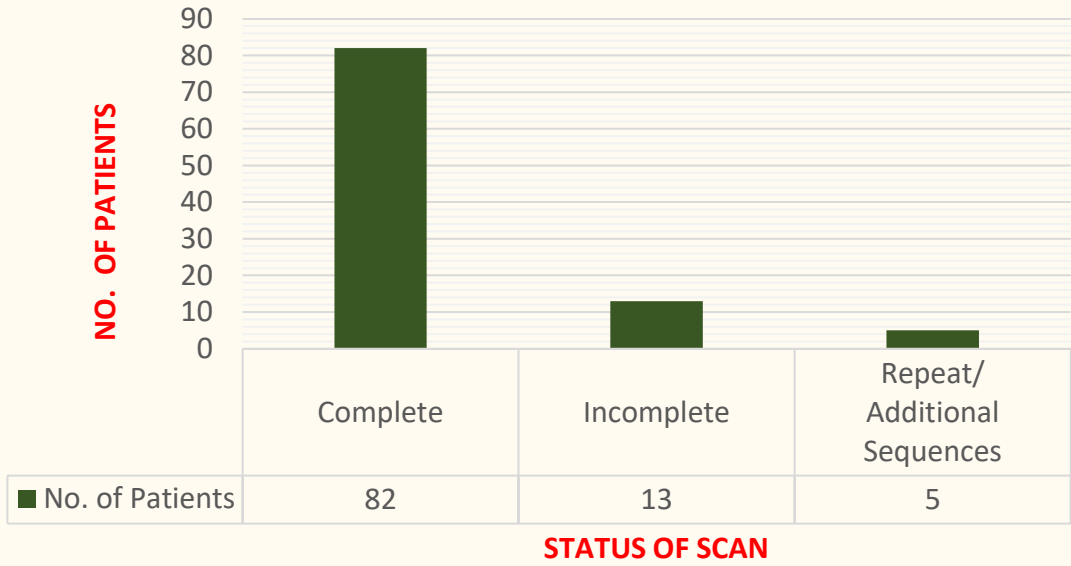


Gender Distribution

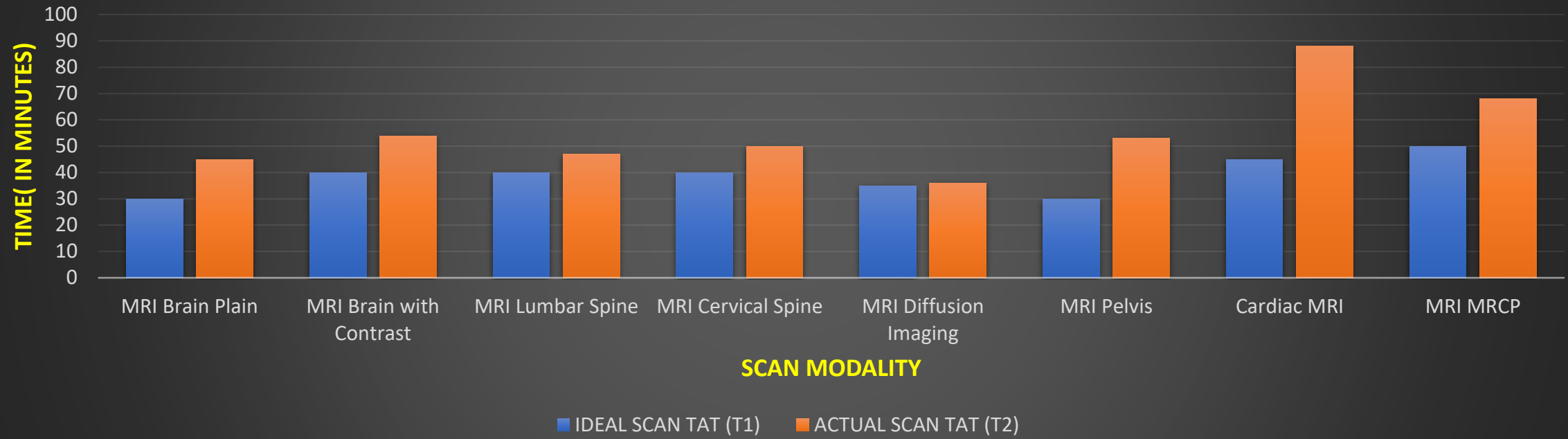


Plain/ Contrast





MRI SCAN TAT



SCAN MODALITY	IDEAL SCAN TAT (T1)	ACTUAL SCAN TAT (T2)	DEVIATION (T2-T1)
MRI Brain Plain	30 Minutes	45 Minutes	15 Minutes
MRI Brain with Contrast	40 Minutes	54 Minutes	14 Minutes
MRI Lumbar Spine	40 Minutes	47 Minutes	7 Minutes
MRI Cervical Spine	40 Minutes	50 Minutes	10 Minutes
MRI Diffusion Imaging	35 Minutes	36 Minutes	1 Minute
MRI Pelvis	30 Minutes	53 Minutes	23 Minutes
Cardiac MRI	45 Minutes	88 Minutes	43 Minutes
MRI MRCP	50 Minutes	68 Minutes	18 Minutes

DATA ANALYSIS



PARETO ANALYSIS

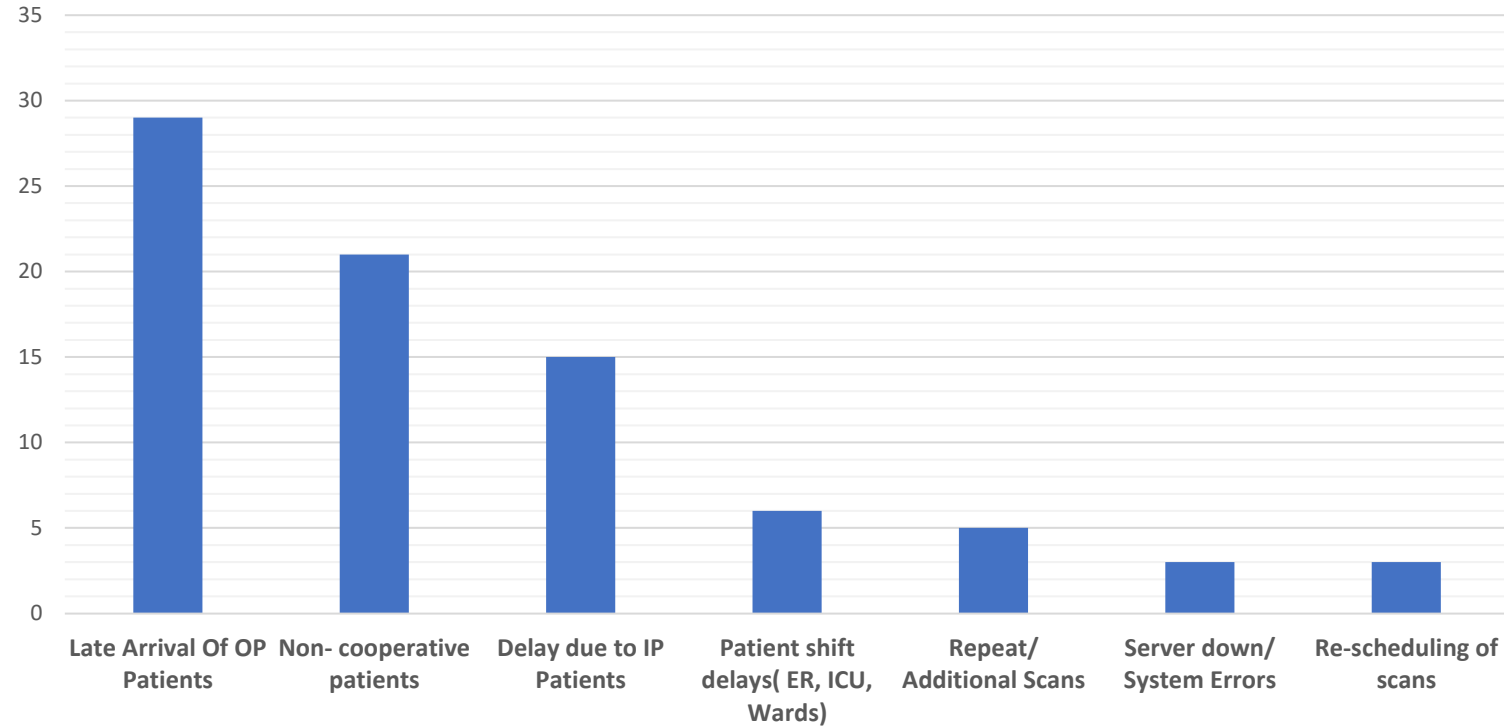
- Effective & powerful quality and decision-making tool.
- Works on 80 20 rules.
- According to 80 20 rules, 80 % of benefits come from 20 % of the work. Similarly, 80 % of MRI scan delays are arising due to 20 % of the causes.

FISHBONE ANALYSIS

- Used to identify & track the root cause of the problem.
- 'Problem statement' : 'Head' of the diagram.
- Categories of major causes: connected to the 'spine' of the diagram.
- Primary Causes & Secondary Causes are mentioned.

PARETO ANALYSIS

CATEGORY	NO. OF PATIENTS
Late Arrival of OP Patients	29
Non- cooperative patients	21
Delay due to IP Patients	15
Patient shift delays (From ER, ICU, Wards)	6
Repeat/ Additional Scans	5
Server down/ System Errors	3
Re-scheduling of scans	3

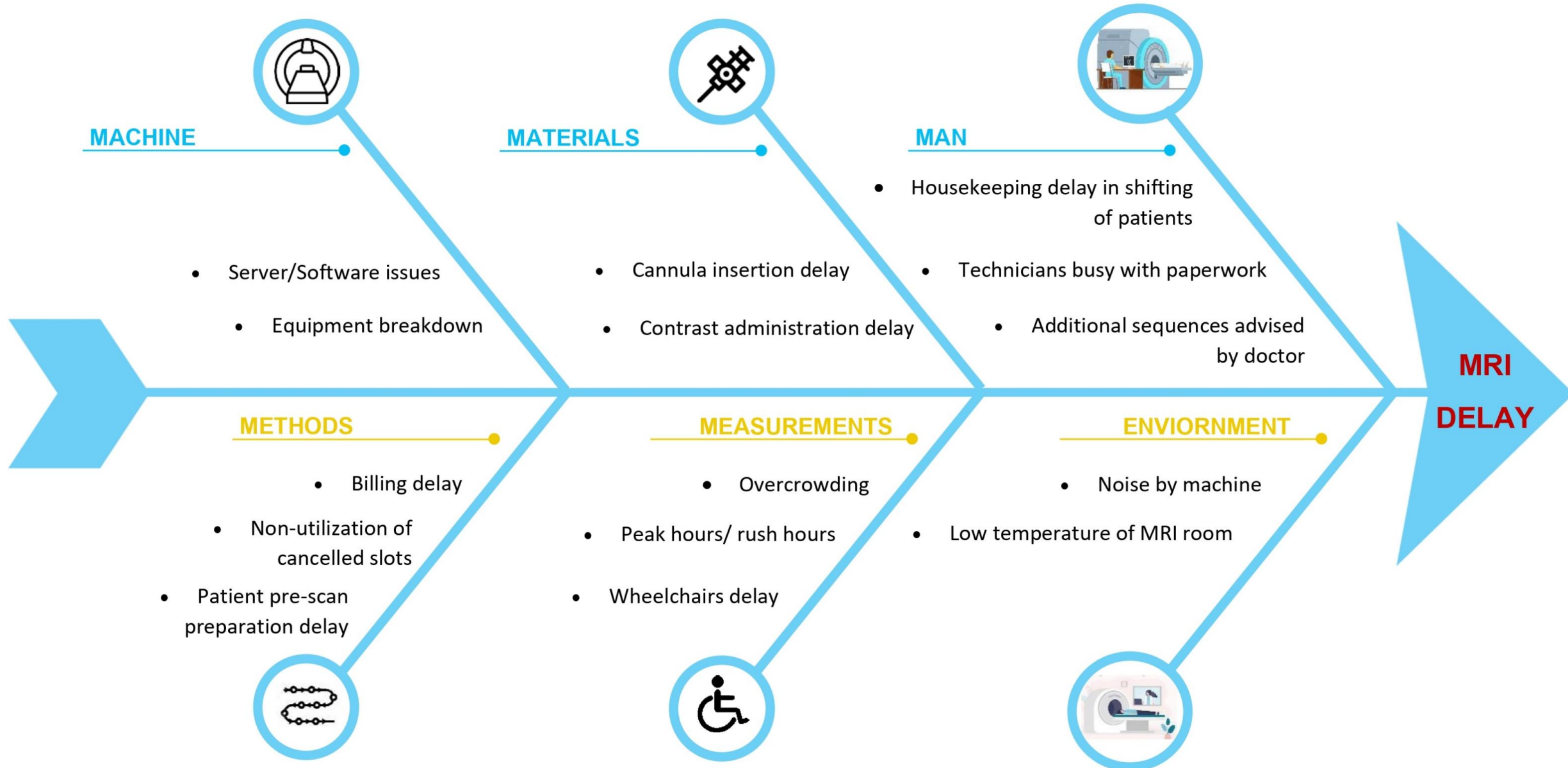


3/7 reasons are responsible for 80% of delays in MRI which are:

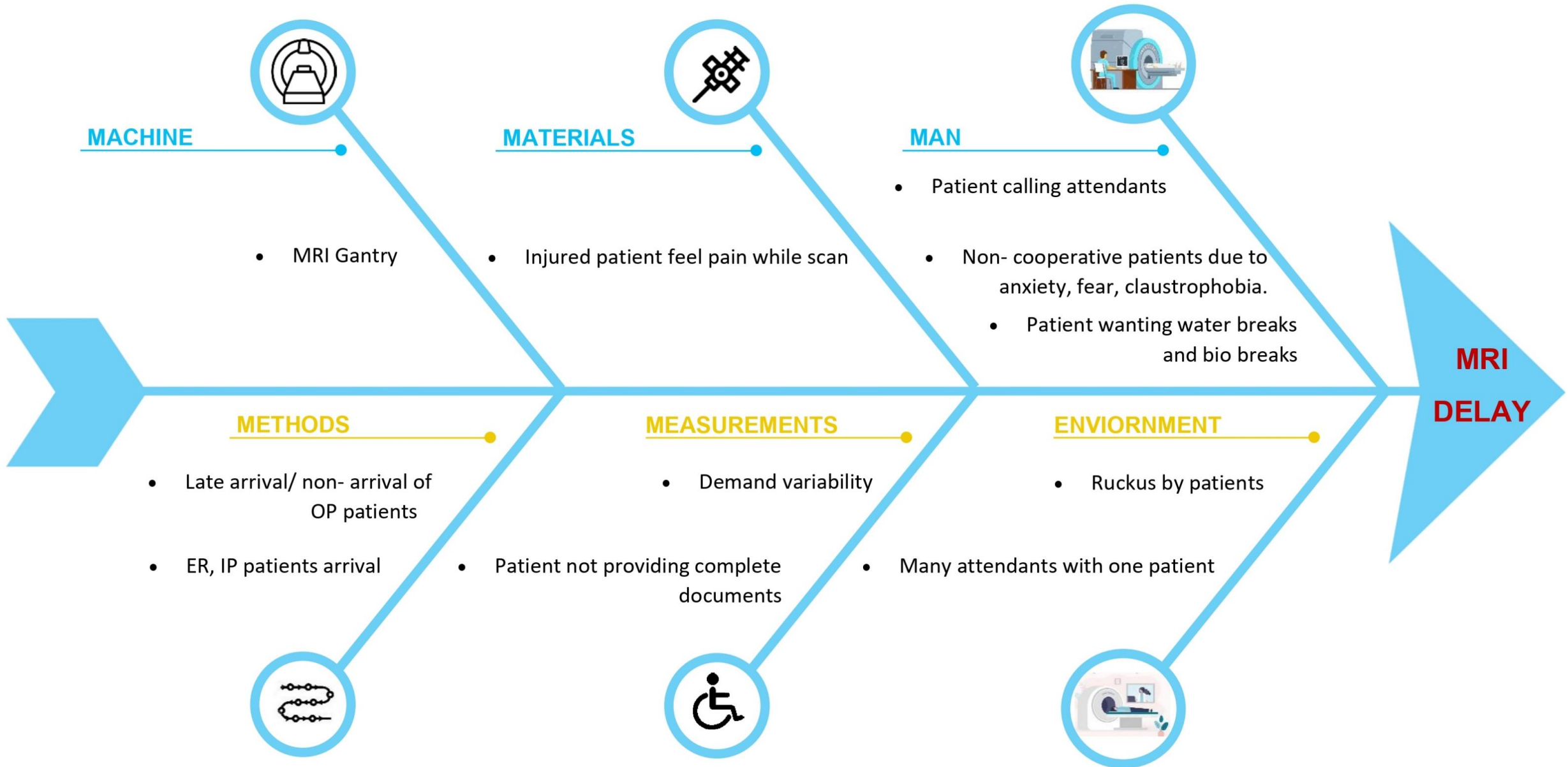
- i. Late Arrival of OP Patients**
- ii. Non- cooperative patients**
- iii. Delay due to IP Patients**

FISHBONE ANALYSIS

1. PROCESS RELATED :



2. PATIENT RELATED :



STUDY FINDINGS

AT PATIENT LEVEL

- Delayed arrival of OP patients from their scheduled arrival time.
- OP patients' unavailability at radiology department even after their arrival.
- Non-cooperative patients due to anxiety, discomfort, pain, claustrophobia, decreased temperature in MRI scan room, old age patients, psychiatric issues, pediatric patients.

AT HOSPITAL LEVEL

- In between arrival of Emergency cases, IP patients, patients referred by doctor
- Unpredictable delays due to additional sequences or repeat scans.
- Machine breakdown.
- Server error and system error.
- Delay in pre-scan patient preparation.
- Non - utilization of slots of cancelled scans.
- Too many sequences for a single scan type.
- Shifting delay of IP and emergency patients.
- Post processing of images in PACS by technicians increases TAT time.

AT SERVICE PROVIDER LEVEL

- Doctor asking for more sequences.
- Wrong scan mentioned in bill.
- Anesthesia and sedation cases take longer than usual time.

SUGGESTIONS

AT PATIENT LEVEL

- Dedicated help desk/ counseling desk to counsel and guide patients.
- Patients must be informed about the scheduled appointment time prior with the help of automated messages on their phone.
- MRI compatible cinema vision goggles to watch movies during MRI procedure.
- Melodious and calm music to pacify non cooperative patients during MRI scan.
- Number of attendants per patients must be strictly controlled.

AT HOSPITAL LEVEL

- Temperature of MRI room must be well modulated.
- Streamline and utilization of the cancelled slots appointments must be done accordingly.
- Pre-scan preparation of patient must be done at least 20 minutes prior to scan.
- MRI films must be dispatched to the counter rather than providing it from the console room.
- Optimize scan protocols by reducing the number of slices or sequences.
- Automated post processing tools can be used to reduce delays due to post processing of images by technicians.
- Timely and periodic maintenance of machines.
- Scheduling maintenance during off hours.
- Shifting of patient must be done promptly. Strict instructions must be given to housekeeping staff.

AT SERVICE PROVIDER LEVEL

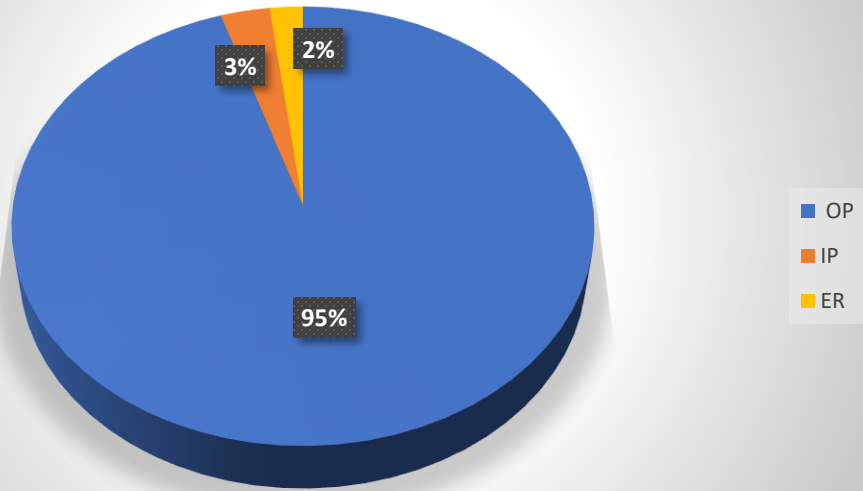
- Doctor must specify the scans clearly in prescription to avoid any confusion during scan.
- Scans of IP patients must be scheduled during night (If not urgent).
- Improvisation of communication between radiologists and technologists so as to reduce repeat scans.
- Contrast injection must be kept ready beforehand, and nurse must be called at least 10 minutes prior to administer contrast to patient.

OBSERVATIONS, DATA ANALYSIS & INTERPRETATION

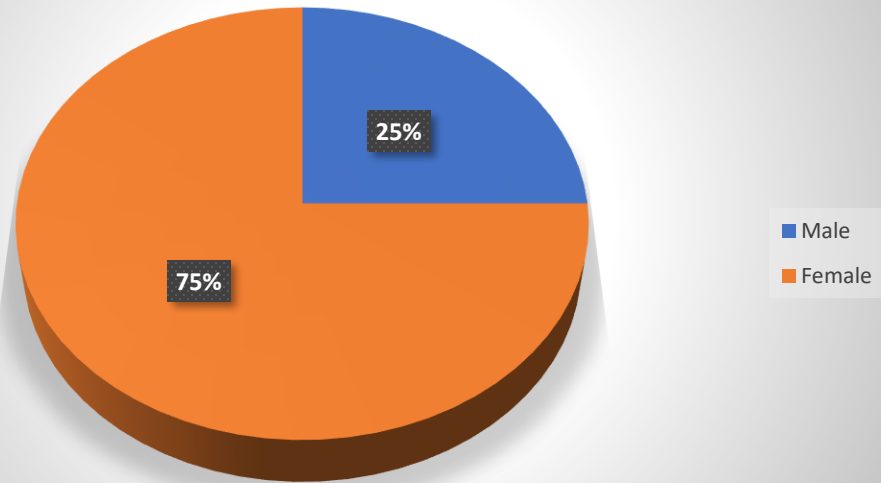
MRI- PARADISE



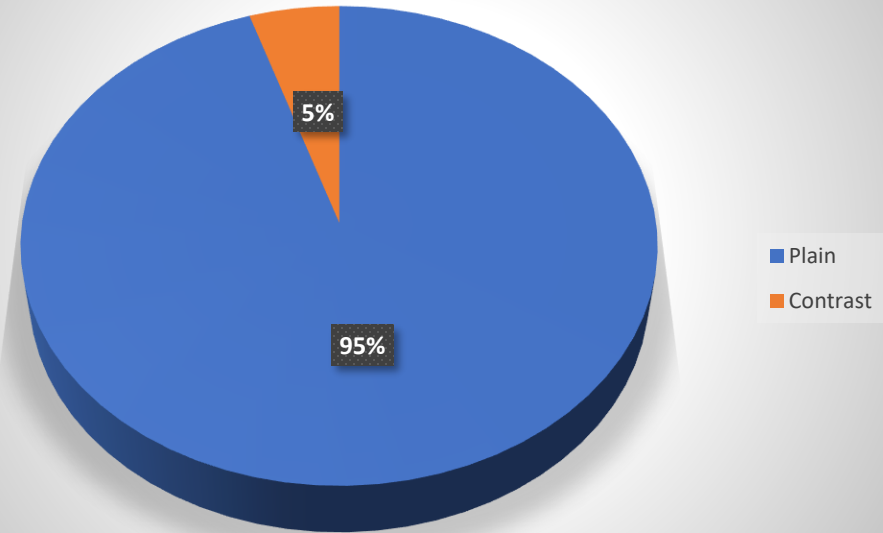
OP/IP/ER

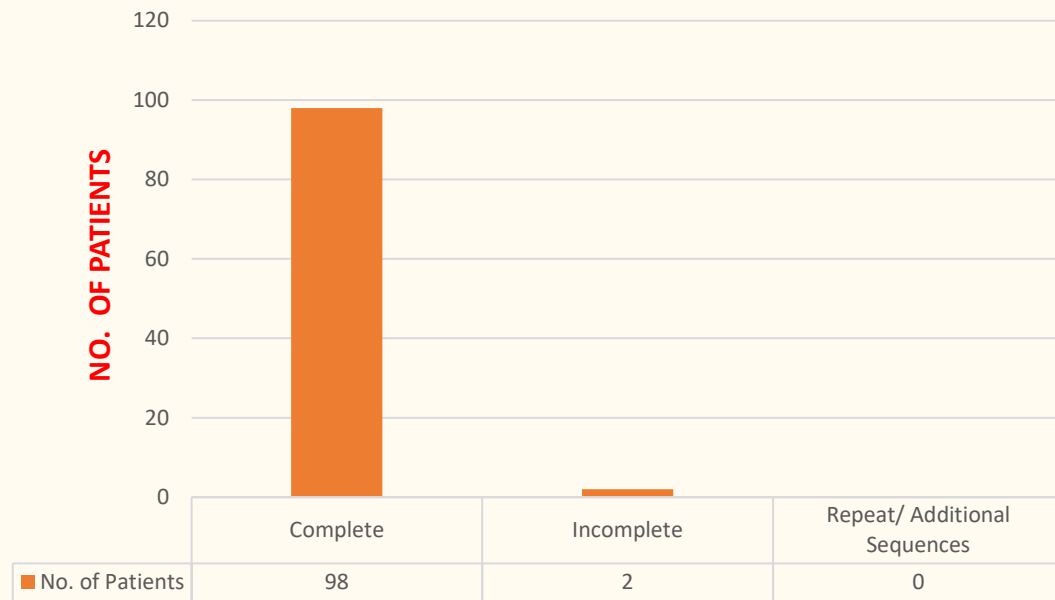


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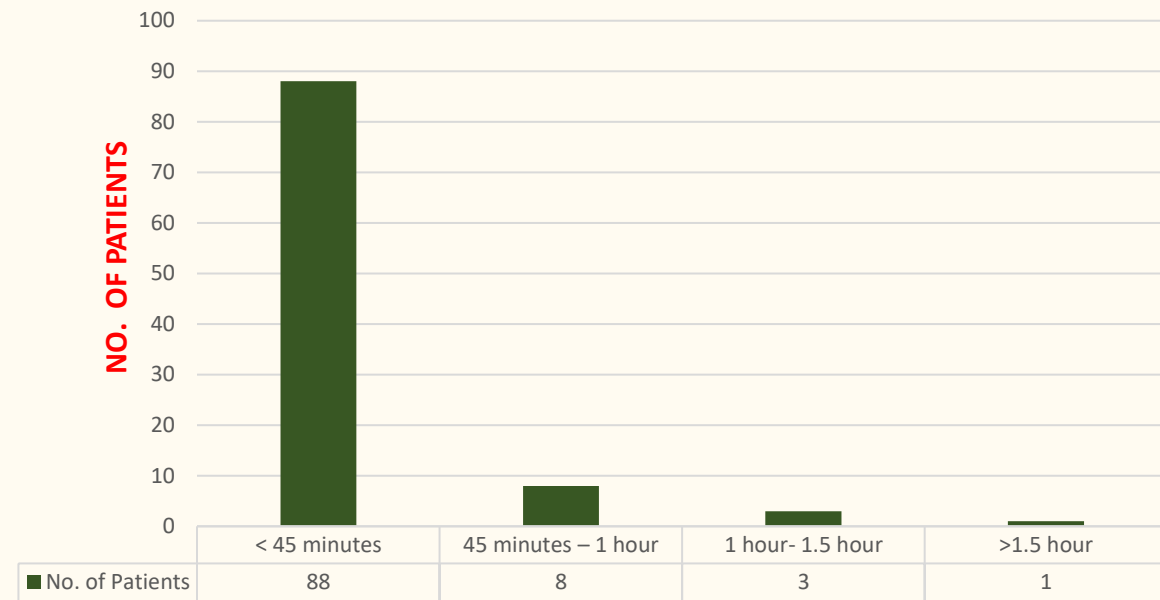


Plain/ Contrast

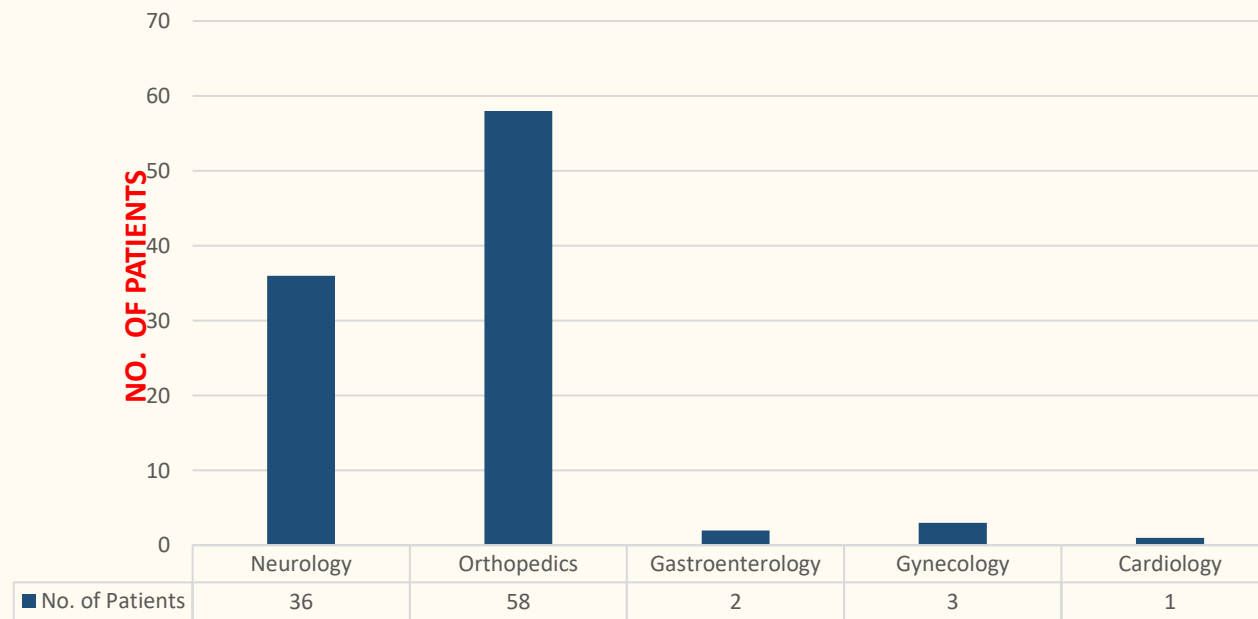




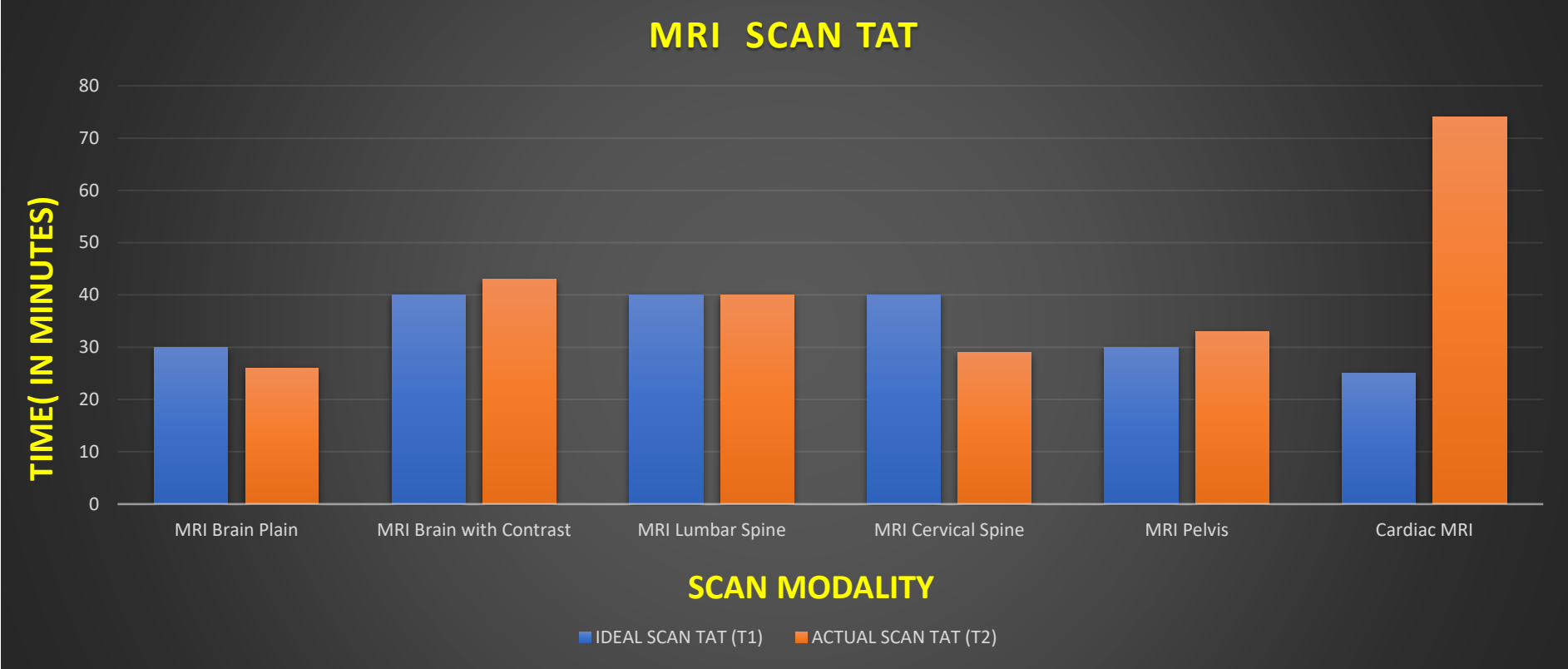
STATUS OF SCAN



SCAN DURATION



SCAN ACC. TO SPECIALITY



SCAN MODALITY	IDEAL SCAN TAT (T1)	ACTUAL SCAN TAT (T2)	DEVIATION (T2-T1)
MRI Brain Plain	30 Minutes	26 Minutes	Done early than Ideal TAT
MRI Brain with Contrast	40 Minutes	43 Minutes	3 Minutes
MRI Lumbar Spine	40 Minutes	40 Minutes	0 Minutes
MRI Cervical Spine	40 Minutes	29 Minutes	Done early than Ideal TAT
MRI Pelvis	30 Minutes	33 Minutes	3 Minutes
Cardiac MRI	25 Minutes	74 Minutes	49 Minutes

MRI COMPARISON BETWEEN SECUNDERABAD & PARADISE BRANCH

PARAMETERS	MRI- COMPARISON	
	SECUNDERABAD	PARADISE
Check-in & checkout of patients by technicians	On computers. So, they forget to do real time check-in & check-out.	On tablets.so, they promptly do real time check-in & check-out.
Post processing of images.	During & even hours after scan completion.	Only during the scan.
No. of sequences per scan	More in number.	Less of number.
Repeat scans	Yes	No
Patient entry in MRI room	Delayed	Immediate after previous scan completion.
Pre-scan patient preparation	Done at the time of scan or 5 minutes prior.	Done at least 15 minutes prior.
Non-cooperative patients	Lead to incomplete scans/longer duration of scan time.	Play calm soothing music to handle non-cooperative patient.
Incomplete scans frequency	More	Very less/zero.
Patient positioning done by	Housekeeping, so it leads to errors possibility.	Technician, so it means zero error possibility.
Contrast administration by	Nurse (delay due to non-availability)	Technician(No delay)
IP patient scan	During OPD timings.	Only when the machine is free i.e. when OP patients not there.
Films printing	1-2 hours after scan completion	Immediately after scan completion
Films distribution	Directly to patient from MRI console room	From queuing counter.
Patient cooperation rate	Low due to longer scan durations.	High due to less scan duration.
Utilization of cancelled slots	No	Yes

Thank
You