Dissertation

In

PARK HOSPITAL

(JANUARY 10 – APRIL 10, 2013)

Title of the Report

STUDY OF SAFETY PROTOCOLS FOLLOWED BY PATIENT AND STAFF WITH TIME MOTION STUDY IN RADIOLOGY DEPARTMENT

Name of Student
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(PG/12/106)
(Batch-E)

Post-Graduate Diploma in Hospital & Health Management
New Delhi
2012-14
International Institute of Health Management Research, New Delhi
2013

Park Hospital

To whomsoever it may concern

This to certify that **Dr. Vishal Kaikade** student of **International Institute of Health Management Research, New Delhi** has successfully completed her dissertation in **Operations Department** starting from **10th January 2014 to 10th April 2014**.

During his dissertation, we found him to be hardworking, honest and sincere. Him conduct was good during this period.

We wish him all the very best in his future endeavors.

Mr. Sajay Sikdar

Manager HR

Park Hospital

Faridabad

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TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Vishal Kaikade student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at Park Hospital,Faridabad From 10th January,2014 to 10th April,2014.

The Candidate has successfully carried out the study designated to him during internship training and his approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements. I wish him all success in all his future endeavors.

Dr. A.K. Agarwal
Dean, Academics and Student Affairs
IIHMR, New Delhi

Ms.Anupama
IIHMR, New Delhi

Certificate of Approval

The following dissertation titled **"STUDY OF SAFETY PROTOCOLS FOLLOWED BY PATIENT AND STAFF WITH TIME MOTION STUDY IN RADIOLOGY DEPARTMENT"** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a pre-requisite for the award of **Post- Graduate Diploma in Hospital and Health Management** for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
Prof A K Agarwal	
Prof S. Satpathy	
Dr. Suparna Pal	

Certificate from Dissertation Advisory Committee

This is to certify that **Dr.Vishal Kaikade**, a participant of the **Post Graduate Diploma in Health and Hospital Management**, has worked under our guidance and supervision. She is submitting this dissertation titled, **"STUDY OF SAFETY PROTOCOLS FOLLOWED BY PATIENT AND STAFF WITH TIME MOTION STUDY IN RADIOLOGY DEPARTMENT"** in partial fulfillment of the requirements for the award of the **Post-Graduate Diploma in Health and Hospital Management.**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Ms.Anupama

Assistant Professor

IIHMR, New Delhi

Date:

Dr. Pradeep Malik

Assistant Medical Supdt.

Park Hospital, Faridabad

Date:

INTERNATIONAL INSTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled ..STUDY OF SAFETY PROTOCOLS FOLLOWED BY PATIENT AND STAFF WITH TIME MOTION STUDY IN RADIOLOGY Apr. and submitted by (Name) ..Dr. VISHAL KAIKADE ..... Enrollment No. ..PG/12/106 under the supervision of ...Ms. ANUPUMA ..... for award of Postgraduate Diploma in Hospital and Health Management of the Institute carried out during the period from 10th JAN 2014 to 10th APRIL 2014. 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.

Vishal.

Signature

FEEDBACK FORM

Name of the Student: Dr. Vishal Kaikade

Dissertation Organization: Park Hospital Faridabad

Area of Dissertation: Operations

Attendance: 98%

Objectives achieved: Yes

Deliverables: Well Defined and Accurate.

Strengths: Good managerial skills with good communication Skills, Well Mannered, Clarity of thoughts, focused.

Suggestions for Improvement: Keep up one good work, keep emotions in control.

11/4/2014

Signature of the Officer-in-Charge/ Organization Mentor (Dissertation)

Dr. PRADEEP MALIK

ASSISTANT MEDICAL SUPRITENDENT

PARK HOSPITAL FARIDABAD

Date: 11th April 2014

Place: Faridabad

ACKNOWLEDGMENT

Any attempt at any level cannot be satisfactorily completed without the support and guidance of learned people. We owe a great debt to all the professionals at Park Hospital, Faridabad for sharing generously their knowledge and time, which inspired me to do our best during my Dissertation.

I would like to express our immense gratitude to **Dr. Ajit Gupta** Chairman and Dr. P. S. Yadav Medical Director for providing support and guidance for the learning in the hospital and for directing the thoughts, goals and objectives towards the attitude that drives to achieve and other aspects that one as novice needs to be acquainted with. It has been a privilege to work under his dynamic supervision at the hospital.

I express my heartfelt gratitude to **Dr. Pradeep Malik Assistant Medical Superintendent** for providing me with valuable information and an opportunity of working in his department.

I am glad to acknowledge **Dr. L.P.Singh, Director, Dr. A. K. Aggarwal, Dean, Academic and Students' Affairs, and Ms Anupama (Mentor), IIHMR** for incorporating right attitude into me towards learning and for helping and supporting whenever required. I am grateful to them for giving me an opportunity to learn administrative tricks and styles, so that I come to know how a hospital caters their patients successfully and how a hospital gives quality treatment to patients.

I would also like to thank Dr Saket and Dr. Vishnu Consultant Radiology Department for their constant support and guidance during my entire project.

EXECUTIVE SUMMARY

Healthcare industry is one of the largest sectors, in terms of revenue and employment and the sector is expanding rapidly. This industry includes various sub-sectors like Hospital, Pharmaceutical, Diagnostic, Insurance; IT etc. One driver of growth in the healthcare sector is India's booming population, currently 1.23 billion populations. By 2030, India is expected to surpass china as the world's most populous nation. By 2050, the population is projected to reach 1.6 billion.

This report presents results of a study conducted at **PARK HOSPITAL FARIDABAD and concerned with the" STUDY THE SAFETY PROTOCOLS FOLLOWED BY PATIENT AND STAFF WITH TIME MOTION STUDY IN RADIOLOGY DEPARTMENT**". A thorough mapping of the existing process flow and analysis of 500 patients in radiology were conducted. Results revealed that in its current form, almost all Radiology achieved effective patient waiting time management, walk in patients are more in radiology, and the process needs little more improvement. These issues some time causes patient to overstay at waiting hall. Obtained results indicate that organizational changes and some more improvement (increase manpower, adopting token system for USG etc.) will lead to process effective, smoother and substantial economic benefits.

TABLE OF CONTENT

LIST OF TABLES

LIST OF ABBREVIATIONS

ALARA - As low as reasonably achievable
PACS - Picture Archiving and Communication System
TLD - Thermo luminescent dosimeter
BARC - Bhabha Atomic research Centre
BME - Bio medical Engineer
CT – Computed Tomography
MRI - Magnetic Resonance Imaging
USG - Ultrasonography.
KUB - Kidney, Ureter, Bladder.

ORGANIZATION PROFILE

Park Hospital

The Park Legacy

The Park has a strong legacy of more than 3 decades that redefines healthcare arena in a unique and larger perspective. Since its inception the group has always strived to take the healthcare services to a new level. This journey of healthcare excellence and highest level of patient satisfaction has seen many milestones on its way. Today the group boasts a panel of more than 100 doctors and an array of state-of-the-art healthcare facilities across its hospitals in West Delhi, South Delhi, Gurgaon, Faridabad and Panipat. Patients at Park include common people, corporate, government employees and many who's who of the society. Park envisions of providing latest and affordable services to the people of all social and economic backgrounds. With a passion to surpass patients' expectations and bring about a meaningful change in the lives of people, the Park is on its way to becoming a leading healthcare provider of north India.

Chain of Park Hospital

Park Hospital (Gurgaon)

Park Hospital (West Delhi)

Park Sunil Hospital (South Delhi)

Park Cancer Hospital (West Delhi)

Park Hospital (Faridabad)

Park Hospital (Hodal)

Park Hospital Faridabad

Park Hospital Faridabad is an ambitious initiative from the house of Park. Fully-equipped with all state-of-the-art medical facilities, this hospital, with a capacity of 250 beds, is the beginning of a new era in taking healthcare services to a new level. Park Hospital envisions of providing a comprehensive spectrum of advanced medical & surgical interventions with a perfect mix of inpatient and outpatient services to people of all social and economic backgrounds. It is the onset of a new experience where patients not only get medical services as per international standards but also receive an empathetic and humane treatment by the professionals attending to them. It is about pursuing a dream called 'wellness for all'

The Park has a strong legacy of more than 3 decades that redefines healthcare arena in a unique and larger perspective. Since its inception the group has always strived to take the healthcare services to a new level. This journey of healthcare excellence and highest level of patient satisfaction has seen many milestones on its way. Today the group boasts a panel of more than 100 doctors and an array of state-of-the-art healthcare facilities across its hospitals in West Delhi, South Delhi, Gurgaon, Faridabad and Panipat. Patients at Park include common people, corporate, government employees and many who's who of the society. Park envisions of providing latest and affordable services to the people of all social and economic backgrounds. With a passion to surpass patients' expectations and bring about a meaningful change in the lives of people, the Park is on its way to becoming a leading healthcare provider of north India.

The Park Mission

"To deliver state-of-the-art personalized healthcare services to people of all social and economic background and achieve highest level of patient satisfaction."

The Park Vision

"To be a leading name in the healthcare sector by providing holistic healthcare at affordable cost."

About Logo

P E R S O N A L I S E D

A L L S P E C I A L I T I E S

R E S O N A B L E C O S T

Q U A L I T Y S E R V I C E S

The two hands stand for care & help. Blue color signifies excellence and orange indicates the zeal for care. The logo also assure people that they are in safe and caring hands

Commitment Towards Quality

At Park Hospital, we believe in our people, our systems and our commitment to quality and continuous improvement. It is our aim to deliver safe, cost-effective care to the community and the patients we serve. At Our Hospital we believe that the patient experience is comprised of outstanding quality and excellent customer service.

We are committed to provide our patients with the: Highest-quality, safest and most-satisfying care possible.

There are many factors that patients and their families consider when choosing a hospital, but, the most important ones are the quality of patient care and the satisfaction experienced by both the patients and their families. That's why we follow strict quality and safety practices throughout our entire hospital, monitor our staff's compliance with these practices and continuously seek ways to improve.

Park Hospital is committed to meet or exceed customer expectation in quality, delivery and cost. As the level of their expectation increases every year, continuous quality improvement is critical to our success in the competitive marketplace.

"Doing the right thing, the right way,

at the right time, in the right amount,

for the right patient

that does not result in harm to the patient."

For us, quality performance means two things. First, we take pride in satisfying our customers by delivering services to meet their specified requirements at affordable cost. Secondly, we are committed to continuously improving the processes and revising the standards by which we provide our services so that our work meets requirements and is done right the first time.

The key elements of a successful strategy

- Developing the right culture for quality to flourish
- Attracting and retaining the right people to promote quality
- Devising and updating the right in-house processes for quality improvement
- Giving staff the right tools to do the job.

Why Park?

- 30 years of trust and unmatched experience
- Understands the difference between ‘being well’ and ‘wellbeing’
- Comprehensive quality care at an affordable cost
- Wide range of healthcare solutions under one roof
- Inspired by humanity & driven by values
- Based on the philosophy of ‘Patient First’
- One of the fastest growing healthcare names of Delhi NCR
    - Excellent track record in patient care and satisfaction

SERVICES AVAILABLE AT PARK HOSPITAL FARIDABAD

Cardiology Department

Cardiovascular Division at Park Hospital is **Centre of Excellence for Cardiovascular Sciences**. We have one of the best technologies, skills and knowledge to ensure that every patient gets best cardiac treatment.

CARDIAC CATH LAB

Park Hospital has latest GE Innova® 3100 IQ which can perform a wide range of procedures including peripheral, neurological imaging and cardiac. It has imaging system that offers advanced technologies, such as AutoEx, features and controls to help effectively deliver excellent required image quality at a low dose. It particularly helps clearly see fine vessel detail right up to the surface of the skin with its excellent dynamic range. It Images small vessels all the way to the body's periphery without density filters or close collimation. The square format panel offers a wide range of complex cardiac positioning angles with InnovaSense™ automatic patient contouring to help optimize efficiency. Panel size and magnification to a 12 cm field of view provides imaging of large cardiac silhouettes. It obtain excellent peripheral angiographic and interventional imaging virtually anywhere in the body with convenient detector positioning, flexible acquisition protocols, and excellent image quality with industry leading dose efficiency.

Interventional Procedures

- Coronary Angiography and Coronary Angioplasty,

- Complex Coronary Interventions including left main, ostial and bifurcations,
- Peripheral Angiography and Angioplasty
- Pacemaker implantation,
- ICD implantation
- Rotablation Rotational Atherectomy, Directional Atherectomy and Rotacs Procedure,
- ASD/VSD Closure
- BMV
- Intravascular Ultrasound (IVUS)

Park Hospital is first Hospital in the country to bring in **Laser Coronary Intervention** and **Remote Magnetic Navigation System (Robotic Angioplasty)** soon. The hospital also runs a 24 hour acute myocardial infarction intervention (**Primary PCI**) program which is supported by 24 hour functional cath lab, onsite interventional cardiologist, cath lab nurse and technologist. The average "door to balloon time" here is less than 45 min which is comparable to the best centers in the world. The cath lab procedures are supported by an expert team of anesthesiologists who make the procedures safe and pain free. Well equipped Day cath facilities, pre and post cath areas of international standards make the procedure a very pleasant experience.

Cardiac Surgery

At Park Hospital we perform all types of thoracic and cardiovascular operations have including Port Access surgery, Off-Pump Coronary Artery Bypass (OPCAB), and Minimally Invasive Coronary Artery Bypass (MIDCAB), with one of the best success rate in the world.

- Bypass surgery
- Valve surgery
- Congenital heart surgery
- Aortic surgery
- Atrial fibrillation surgery
- Hypertrophic cardiomyopathy surgery
- Heart failure surgery
- Minimally invasive heart surgery

Patient-centered system

We strive to provide each patient and family member with education, support and world-class medical care extending from his first visit until discharge. We are also provide personal services (including a free "concierge" service for out-of-state patients) that put the comfort and well-being of cardiac surgery patients before all other considerations.

Outcomes

Every year, the heart surgeons at Park Hospital achieve outstanding surgical outcomes – even for the most complex, difficult cases. The Park Hospital model emphasizes an integrated, team approach to provide the best care for each patient.

Latest Advances

Park Hospital is on the cutting-edge of new, advanced treatment options, such as minimally invasive cardiac surgery, “off-pump” bypass and robotically assisted surgery.

Our Working Philosophy

In addition to offering ground-breaking technology, our program provides patients with the advantage of an on-site multi-disciplinary team of anesthesiologists, intensivists, interventional radiologists, vascular surgeons, advanced practice nurses, nurse practitioners, dietitians, physical therapists, and social workers.

This team often expands to include immediate care from on-site physicians from every medical specialty required. Our multi-disciplinary approach and expertise has gained us the reputation of being the best-prepared practice to handle procedures that may be complex and/or complicated by underlying illness or age. Our cases consisting of many complex and complicated procedures in all areas, including pediatric and aortic cardiac procedures, assures patients that they are receiving the best care possible from some of the most experienced and expertly skilled surgeons in the world.

Orthopedics Department

This center at Park Hospital offers the following surgical care employing sophisticated techniques for the treatment of joints using equipments like operating microscopes and computer navigations.We have the operation theaters equipped with Laminar Air flow systems and Specialized filters to minimize the risk of infections.

The center is equipped with latest implants like high flexion implants and offers physiotherapy services.

General Orthopedics

- Deformity correction
- Reduction of fracture
- Sport Injuries
- Treatment of Degenerative diseases like – Osteoporosis

Joint Reconstruction

- Arthroscopic surgery
- Hand Surgery
- Hip Replacement
- Knee Replacement
- Shoulder replacement
- Surface replacement of hip

Ortho Spine Treatment

- Spine fracture and Paralysis
- Degenerative Spine
- Revision spine Surgery
- Spine Instrumentation
- Spine Tumor
- Ozonolysis

Neurology and Neurosurgery Department

This department at Park Hospital offers evaluation, specialized care of wide range of services to patients with Backache, Brain Hemorrhage, Epilepsy, Facial pain, Headache to stroke, Neuro oncology and Spinal disorders

Stroke center

- Intraarterial thrombolysis
- Intravenous thrombolysis
- Mechanical thrombolysis
- Stroke prevention
- Stroke rehabilitation

Clinics

- Dementia Clinic
- Headache Clinic
- Movement Disorder Clinic
- Multiple sclerosis

Services Aavailable

- Brain Tumour surgery
- Cerebro –vascular Surgery
- Deep Brain Stimulation
- Head Injury Surgery
- Neuro Navigation
- Paediatrics Neurosurgery
- Skull base Surgery
- Sterotactic Neurosurgery

Spine Surgery Center

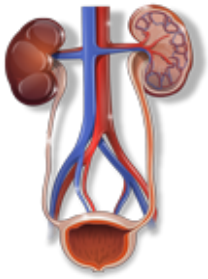
- Anterior Decompression and fixation of Cervical spine
- Corrective Surgery for Kyphosis /Scoliasis
- Disc replacement
- Kyphoplasty y
- Minimal Invasive spinal surgery
- Paediatrics Neurosurgery

- Posterior Lumbar interbody fusion
- Retriperitoneal Decompression
- Transformational Lumbar Interbody fusion
- Transthoracic Decompression

Neurophysiology Laboratory

- EEG
- EMG
- Evolved Potentials
- Long term Memory Test
- Nerve Conduction Studies (NCV)
- Sleep studies

Nephrology & Urology Department



Park Renal Center of Kidney and Urology is a unique resource for those with the diseases of the urinary system, including the kidneys, bladder and prostate gland. We are proud to offer some of the region's finest experts covering every major urology and nephrology specialty. We provide patient oriented management of cancer and benign urological diseases by integrating and leveraging our combined expertise. The center works as a cohesive team with interdisciplinary interactions between urologists, nephrologists, medical and radiation oncologists.

Facilities Offered

Nephrology

- CRRT , Plasma –phersis
- Dialysis done under the supervision of Nephrologist with separate room for separate patients
- Facility for isolation hemodialysis
- Latest ultramodern hemodialysis machines with bicarbonate dialysis
- Preventative & Critical care Nephrology
- Reverse Osmosis water plant for pure and trace element free water for dialysis

Urology

- Non surgical removal of kidney stones through Lithotripsy
- Cystoscopy
- Bladder Cancer surgery
- PCNL
- Benign prostatic hyperplasia
- Erectile dysfunctional
- Kidney cancer
- Kidney stone surgical management
- Pediatric urological problem
- Penile cancer
- Prostate Cancer
- Laser surgery for Prostate
- Prostatitis
- Testicular cancer
- Urinary incontinence
- Hernia & Hydroceles

Gastroenterology Department

Gastroenterology is a medical specialty dealing with the study of the digestive system and its disorders. Diseases affecting the gastrointestinal tract, which includes the organs from mouth to anus, along the alimentary canal, are the focus of this specialty. Hepatology, or hepatobiliary medicine, encompasses the study of the liver, pancreas, and biliary tree, and is traditionally considered a sub-specialty associated with gastroenterology. The knowledge and technology in Gastroenterology has grown in the last times.

The department of Gastroenterology at Park Hospital provides a comprehensive and state-of-the-art service by means of the outpatient and inpatient facilities. The department is managed by experienced Gastroenterologists, efficient medical officers, skilled and compassionate paramedical staff and well trained technicians and other personals. The latest equipments and technology of the department is supported by the highly skilled and expert medical and paramedical staff. The department is proficient in providing excellent medical care for all the patients with disorders of the gastro-intestinal system.

Some of the illnesses managed by the department are:

- Esophageal disorders: Reflux, motility problems, malignancy
- Peptic ulcer disease
- Complex luminal disease: e.g. inflammatory bowel diseases
- Irritable Bowel syndrome
- Gastrointestinal infections
- Gastrointestinal bleeding of all causes
- Symptoms like Excessive bloating, "Gas", Loss of appetite, Loss of weight, Anemia, Pain abdomen, Foreign bodies in gastrointestinal tract
- Jaundice both medical and obstructive
- Complex liver disease, Viral hepatitis, infection autoimmune disease
- Chronic liver disease, management of cirrhosis and its complications (Hepatocellular cancer, Variceal bleeding, hepatic encepahalopathy, hepatorenal syndrome
- Gall bladder: cholecystitis, stones, cancer
- Acute and chronic pancreatitis
- Pancreatic Cancer

Facilities

The gastro-intestinal services are supported by both inpatient and outpatient services including

- Upper Endoscopy
- Colonoscopy
- Polypectomy
- Variceal Sclerotherapy/banding
- Esophageal/enteral/colonic Stentig
- Liver biopsy
- Glue injection for fundal varicies

- Esophageal /Enteral dilation, balloon and bougie
- Enteral (naso- jejunal) tube placement
- Sclerotherapy for piles
- Argon Plasma Coagulation (APC)
- Foreign body removal
- Percutaneous Endoscopic Gastrostomy Tube Placement(PEG)
- Endoscopic Cystogastrostomy
- Endoscopic Retrograde Cholangio Pancreatography (ERCP), both biliary and pancreatic
- Therapeutic
- Enteroscopy
- Capsule Endoscopy
- MRCP
- Dietetics and Nutrition
- Screening and Surveillance of gastrointestinal and liver diseases

Pediatrics Department

Park pediatrics care offers state-of-the-art tertiary care in various pediatric specialties. Our aim is to provide holistic care to the children in an environment which is sensitive to the needs of child and the family. To provide comprehensive management of problems of children, excellent support is available from experts in rehabilitation and physiotherapy, dietetics and nutrition, child guidance etc.

The center has well equipped **Pediatric Intensive Care Unit** comparable to best in the world. Our team of doctors at PICU is most dedicated and committed to their patients.

Services offered:

- All types of Pediatric emergencies

- Pediatric Intensive care and Pulmonology
- Pediatric metabolic medicine including juvenile diabetes
- Pediatric neurology
- Pediatric cardiology and cardio vascular surgery
- Pediatric gastro-enterology
- Pediatric nephrology
- Pediatric Oncology
- Pediatric infectious diseases and immunology

General / Minimally Invasive Surgery Department

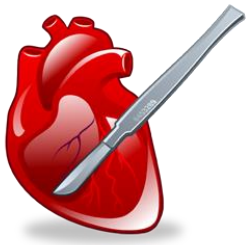
Park Hospital boast of a unique, most advanced comprehensive General as well as Laparoscopic / Minimal Invasive surgery which offers highest degree of most precise Minimal Invasive Surgery done by surgeons of repute following the easiest recovery of patients.

The Department has state of the art Operation Theatres with laminar air flow for air-conditioning with HEPA filters imported dual dome OT lights, low flow anesthesia machines with built in ventilators and complete monitoring system .Patient safety is also enhanced by infection control committee which works towards bringing in almost zero infection rate in all surgical procedures.

Some of the commonly offered surgeries are:

- Advanced Laparoscopic and minimally invasive surgery
- Benign and Malignant diseases of Esophagus, Stomach and intestine
- Gall bladder diseases and surgical jaundice
- Liver ,Spleen and Pancreatic Surgery

Internal Medicine Department



Department of Internal Medicine strives to provide compassionate, comprehensive and state of the art personalized care.

- General Internal Medicine
- Cardiovascular Medicine
- Endocrinology
- Diabetes metabolism
- Hepatology
- Infectious diseases
- Rheumatology
- Immunology

Comprehensive management of infertile couples with emphatic approach

- Ovulation Induction
- IUI
- IVF-ET
- ICSI
- IMSI
- Surgical Sperm Retrieval
- Assisted Hatching
- Budget IVF
- Cryopreservation program
- Surrogacy
- Fertility enhancing surgeries
- Genetic Counseling

- Third party reproduction
- Andrology
- Psychosexual counseling

Intra Uterine Insemination (IUI)

Once known as artificial insemination, intrauterine insemination (IUI) is the process by which sperm is deposited in a women's uterus through artificial means. IUI begets better results when carried out during a natural cycle. Thus it is usually preceded by ovulation induction / ovarian stimulation using appropriate fertility enhancing drugs.

Available facilities for this procedure include an advanced IUI Lab with a separate semen collection room.

In Vitro Fertilization (IVF) & Embryo Transfer (ET)

With IVF, a method of assisted reproduction, a man's sperm and the women's egg are combined in a laboratory dish, where fertilization occurs. The resulting embryo is then transferred to the women's uterus (womb) to implant and develop naturally. Usually, 2-3 embryos are placed in the women's uterus at one time. Each attempt is called a cycle. The term test tube is often used to refer to children conceived with this technique.

Intra Cytoplasmic Sperm Injection (ICSI)

ICSI is advancement in the procedure of in vitro fertilization where in a single sperm is injected directly into egg. This procedure is most commonly used to overcome male infertility problems, although it may also be used where eggs cannot easily be penetrated by sperm as in recurrent IUI failures.

The steps involve in ICSI procedure are exactly the same as for IVF, except that fertilization is achieved with the help of a micromanipulator. In some cases, when there is a complete absence of sperm in the ejaculate, sperm can be retrieved from the testis / epididymis and used for ICSI.

The testicular / epididymis sperm retrieval techniques are PESA (Percutaneous Epididymis Sperm Aspiration), MESA (Microsurgical Epididymis Sperm Aspiration), TESA, (Testicular Sperm Aspiration) and TESE (Testicular Sperm Extraction).

IVF using donor oocyte (eggs) / donor embryo / surrogacy

Some women with poor ovarian reserve who may be unable to produce their own eggs or whose eggs may fail to fertilize during an IVF cycle can be helped by using donor eggs. Replacement at donor embryos and surrogacy are other options available to the infertile couple.

Cryo Preservation of Embryos (embryo freezing)

Cryopreservation is a process where cells or whole tissues are preserved by cooling to low sub-zero temperatures, -196 0C (the boiling point of liquid nitrogen). At these low temperatures, any biological activity, including the biochemical reactions that would lead to cell death, is effectively stopped. These frozen embryos can be used subsequently without the need for ovarian stimulation and egg retrieval.

ENT Department

This department has been equipped with advanced diagnostic and surgical instruments specialized for ENT Care and treatment.

Key Surgeries

- Adenoidectomy
- All Head & Neck cancers
- Audiometry
- Cochlear Implant
- Early deduction of oro-laryngeal cancer
- Endoscopic Nasal Surgery
- Foreign Body removal
- Functional Endoscopic Sinus Surgery (FESS)
- Hearing Aid Trial
- Mastoidectomy
- Microlaryngoscopic Surgery
- Microsurgery for ear and Larynx
- Myringoplasty
- Paediatric Sinusitis Treatment
- Phonosurgery
- Septoplasty
- Speech Rehabilitation

- Stapedectomy
- Surgery for middle and internal ear
- Surgery for Snoring and Sleep Disorders
- Tonsillectomy
- Treatment for Sinusitis
- Tympanoplasty

Dental Care Department

We at Park Hospital can assure you that you have arrived at the perfect resource packed with all the necessary information you need to know and much more. We offer cheap dental implants that help you save a fortune on your treatment when compared to other dental clinics. Their affordability does not in any way overshadow the superlative quality of treatment we offer. As a result, our dental implant packages attract more and more overseas patients every year.Our clinic is completely mercury free and we can get your metal fillings changed into tooth colour fillings in one visit.

Other routine treatments offered at the clinic include Sinus grafting, Bone grafting, Nerve repositioning, Complex Dental Implant, Hi-bridges, dentures fixed to implants and other fixed way of replacing teeth.

Our Hospital have a well respected dental specialist, leading a team of dental experts. This-team of dedicated and dynamic specialists is committed to:

- Treating patients with personalized care and compassion
- Keeping themselves abreast with latest trends & techniques, by regularly attending Conferences, Courses and Continuing Education Programs.

The office conforms to global standards with respect to;

- State-of-the-Science Expertise
- State of the Art equipment
- World Class Material

Park Hospital is committed to ethics high standards and pursuing excellence in advocacy, community service and education.

Together these dental surgeons conduct COMPREHENSIVE DENTAL CARE which includes:

- Dental Implants/Immediate Implants/Teeth In An Hour: Revolutionary as this is as close to natural teeth as can be.
- Micro-Root Canal Treatments, RCT"S (include+ng one sitting RCT"S) to save your natural teeth.
- Piezo-surgery
- Tooth Coloured Restorations beautifully matched to your natural teeth.
- Cosmetic dental procedures viz.. cosmetic contouring and bonding for the Smile Design you always desired.
- Composite Veneers/All Ceramic Veneers/Thineers to close gaps between teeth.
- Brighter Whiter Smile In 1 Hour By Zoom Advanced/procedure for home whitening kit also available.
- Tooth Diamond to add that extra sparkle in your smile.
- Depigmentation of Dark Gums and treatment of gummy smiles.
- Invisible Ceramic Braces/Lingual or Palatal Braces i.e. on the underside of the teeth - Now age no bar and no social embarrassment with braces.
- Clear Aligners viz... Invisalign to allign crooked teeth.
- Nti Device/Night Guard for teeth grinders/bruxers to get rid of that nagging headache/muscle soreness.
- Snore Guard for a sound sleep.
- Sealants/Fluoride treatments for kids as prevention of decay is better than cure.
- Deep Cleaning Of Gums And Root Planing- mandatory every 6 months.
- Surgical treatments; Gum/Bone Grafts/Extractions of teeth including impacted teeth.
- Crowns and Bridges (All Ceramic Metal Free viz. By Procera/ Ceramic fused to metal/ only metal- both non precious and precious).

Park Hospital aims to provide a custom-made, cost-effective treatment plan to suit every discerning patient's needs. High safety standards are adopted at the clinic with great emphasis being placed on asepsis and sterilization. Emergencies are treated on priority.

Respect For Your Time:

- No waiting – treatment by appointment only.
- Scheduling for dento-tourists, in advance.
- Central location, adequate car parking within clinic compound.

- All dental specialities / latest treatment modalities (or single sitting implants / all ceramic crowns /lingual braces etc) and facilities (including comprehensive lab & X-Ray) at one place.
- Co-ordinated care with physician, if required.

Personalized Professional Care:

- Committed and caring team of experienced dental surgeons.
- Custom made, cost effective treatment plan for the discerning patient.
- Facility of advance scheduling for dento-tourists.

Concern For Hygiene And Patient Safety: Strict sterilization procedures:

1) Scrubbing instruments with spirit thoroughly
2) Soaking for 45 minutes in bactericidal antiseptic like KORSOLEX
3) Autoclaving
4) Disposable consumables used

Only international quality material used

Use of state-of-the-art equipment, including:

1) Latest Intra-Oral Camera.
2) Zoom Advanced for teeth whitening within one hour.

Ophthalmology Department

Park's Eye center offers state-of-the-art modern diagnostic, therapeutic, and rehabilitative services of the highest quality in all subspecialties of ophthalmology.

Park's Eye center has all the latest diagnostics and treatment modalities meeting international standards which makes it a preferred destination for eye treatment for both Indian and international patients. A firm commitment to quality is at the heart of all services provided at our Centre. Our hospital incorporates hi-tech eye center with most sophisticated ophthalmic gadgets

Services

- Cataract Surgery
- Lasik Eye Surgery

- Glaucoma
- Retina and Vitreous
- Oculoplasty
- Charity Work
- Refractive Surgery
- Phacoemulsification
- Femto Cataract Surgery

Our sole aim of providing world class and most recent eye technology.Our sate-of-the-art technology can be exemplified with the equipments mentioned below:

- The Automated lamellar keratomilleusis system
- The IOL Master
- The Sovereign Phaco emulsification machine
- The Nidek Cx3 Quest Excimer Laser
- The HRT3 Heidelberg Retinal Tomography System
- The Moria Epi- LASIK system

Physiotherapy Department

Physiotherapy is a health care profession which aims the physical treatment and management of disease or condition which enables people to reach their maximum potential. Physiotherapy is a health care profession which provides services to individuals and populations to develop maintain and restore maximum movement and functional ability. This includes providing services in circumstances where movement and function are threatened by aging, injury, disease or environmental factors. Physiotherapy is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, habilitation and rehabilitation. This encompasses physical, psychological, emotional, and social well being. Physiotherapy utilizes an individual's history and physical examination to arrive at a diagnosis and establish a management plan, and when necessary, incorporate the results of laboratory and imaging studies

Providing quality care to our patients…

- One of the best upcoming centers dedicated solely to the rehabilitation of people with various health and fitness related problems with a multidisciplinary approach

- Dedicated team of professionals in the field of rehabilitation

- Holistic: Holistic approach to rehabilitation (all services under one roof):It caters for the physical, cognitive, psychological, social and cultural dimensions of the personality, stage of progress and lifestyle of both the patient and his/her family.

- Patient-focused: Detailed assessment of every patient by all professionals. Tailor-made treatment program with adequate time spent with every patient during therapy.

- Hands on therapy by experienced therapists with minimal use of electrical gadgets.

- Participatory: The patient and family is well-informed. Regular case meetings of various professionals with the family and patient are conducted regarding the treatment and progress of patient's condition.

- Community-focused:Providing solutions best adapted to the specific characteristics of the community favouring the best possible community reintegration of the disabled person

- Physiotherapy at Park hospital aims for complete rehabilitation of its patients through their active involvement thus helping them to lead a life of maximum functional independence

What kind of health problems/ injuries is treated here?

- Neurological Disorders
- Musculoskeletal Disorders
- Cardiopulmonary Disorders
- Geriatric Disorders
- Pediatric Disorders
- Ergonomic Disorders
- Ergonomic Workstation Evaluations
- Posture Evaluations & Management
- Counseling and Awareness Programs for Stress Related Disorders
- Metabolic Disorders
- Fracture Rehabilitation
- Vestibular rehabilitation
- Reduced Exercise Tolerance
- Sports Injuries
- Post surgical rehabilitation for various conditions

What is different about Park Hospital Rehabilitation Services?

Expertise (Hands on Practice):

- Motor Relearning
- Bobath Approach
- Roods Approach & Vojta
- Neural Mobilization
- Proprioceptive Neuromuscular Facilitation

- Manual Therapy
- Pre and Post operative Cardio-respiratory Care
- Exercise testing and Exercise Prescription for the elderly
- Exercise Prescription in cardiac and pulmonary patients.
- Functional Re-education
- Therapeutic exercise Including Range of Motion Exercises, Strengthening Exercises PRE etc
- Manipulative & Mobilization therapy
- Gait Training
- Progressive Aerobic Exercise
- Body Composition Analysis
- Life Style Management
- Diabetic Counseling
- Weight Management Program
- Stress Management
- Prenatal, Antenatal and Postnatal Exercise Programs
- Group Therapy
- Advanced Relaxation Techniques
- Mental imagery

International Patients

India, an international frontrunner in the healthcare sector, has emerged as a preferred destination for quality medical treatment attracting patients worldwide. Advantages for India as destination for treatment include reduced costs, the availability of latest medical technologies and a growing compliance on international quality standards, as well as the fact that foreigners are not likely to face a language barrier in India. Given this advantage, Park Hospital, Gurgaon welcome you to the comforting family of Park Group of Hospitals. We ensure a completely sanitized environment and personalized care.

We have a comprehensive international patient's services division manned by professionals having vast experience in service industry. With highly advanced medical infrastructure, broad knowledge base, medical expertise and extensive integration, Park Hospital is an ideal partner for international patients seeking a more affordable treatment away from their homes.

Our International Patient Services include

- Airport transfer Service
- Scheduling of all medical appointments
- Co-ordination of the admissions process
- Cost estimates for anticipated treatment
- Processing of medical second opinions

- Booking of Hotel/Service Apartments
- Provide Language Interpreters
- Special dietary needs / religious arrangements
- Local Sightseeing
- Foreign Exchange
- Providing news & information of patient's relatives back home

The health procedures we render to our international clients are:

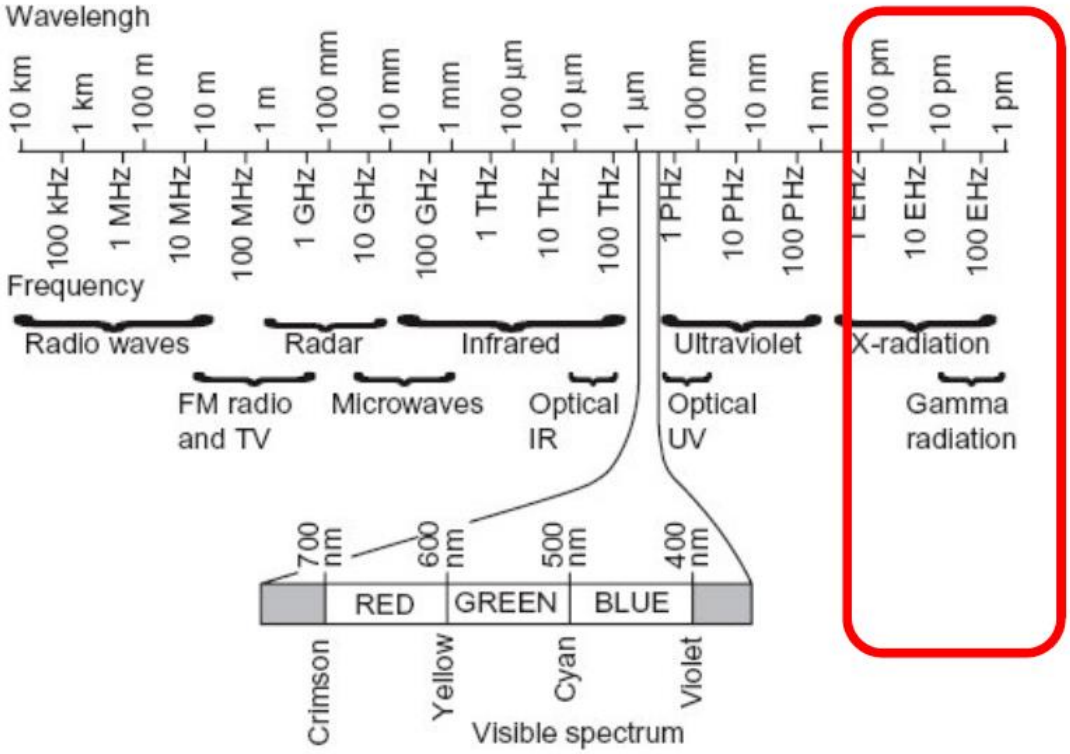
- Cardiac Surgeries
- Total Knee/Hip Surgery Replacements
- Birmingham Hip Resurfacing Procedure
- Liver, Multi-Organ, and Cord Blood Transplants
- Coronary Angioplasty
- Abdominal and Thoracic Aneurysm Open and Endovascular Repairs
- Carotid Endarterectomies
- Distal Tibial bypasses for limb salvage
- Endovenous Laser Treatment of Varicose Veins
- Stereotactic Radiotherapy and Radiosurgery
- Cosmetic Surgery
- Bariatric Surgery - laparoscopic
- Laparoscopic Hernia Repair
- Laparoscopic Adrenalectomy

We ensure that our patients get the best of our services. We rely on an integrated and ubiquitous IT system that shepherds patients from area to area and relays patient information, including test results, digitally between doctor and technician

Our staff takes compassion & caring as their primary concern while serving the patients. The prime goal of our hospital is to provide dedicated and proficient health services. Our senior doctors are not only qualified with many years of experience in their respective field but, posses a vast ocean of knowledge. We have an exclusive International patient care centre to cater to the needs of foreign nationals

RATIONALE OF THE STUDY

Since the end of the 19th Century, man has learned to use radiation for many beneficial purposes. Today, many sources of radiation, such as x-ray machines, linear accelerators and radionuclides are used in clinical and research applications. Such beneficial uses may at times create potentially hazardous situations for personnel who work within the hospital.



With health care industry competition on the rise, many hospitals are looking for ways to improve patient satisfaction.

This study is conducted to get overall idea about the working of Radiology department of the hospital also to observe the safety protocols followed for patient and staff in radiology department and the time motion study of the same.

INTRODUCTION

Radiology is part of the service industry and as a service provider one needs to understand quality and delivery of service. This includes knowledge of customer service, customer satisfaction and all its related issues as well as quality assurance and improvement issues.

Service quality and delivery in radiology are closely related but not the same. Nevertheless, both are required for customer satisfaction.

Academic and institutional radiology departments are now often considered as revenue centre in their hospitals. A cost centre is a unit or department in an organization for which a manager is assigned responsibility for managing costs. Revenue generation is not the main concern of the department but cost control is of utmost importance. They are also often called support centers. With a revenue or profit centre, maximum revenues are generated and minimum expenses are incurred. The manager's role is to maximize profit while minimizing losses. Salary packages of academics also often include a clinical component. Senior radiologists need to have an understanding of the financial aspects as well as service aspects of a radiology department.

With increasing budgetary restraints on the health system, it is apparent that the main contribution that radiology departments can make to significant cost reduction in hospitals is to decrease the length of time between requesting an X-ray examination and receiving the report (and images).

Although much of the attention paid to patient and procedure verification has focused on surgery, occurrences of patient misidentification, procedure mistakes, and side or site confusion errors and near misses continue to surface outside the surgical suite. Despite quality improvement efforts, the prevalence of these errors in other disciplines, namely, radiology services, may be more common than generally expected and reported

All forms of ionizing radiation, whether naturally-occurring (e.g., radon or cosmic rays) or as part of a medical exam, carry some degree of potential health risk. While these risks must

acknowledged, they must also be seen in perspective—and in general, and when performed appropriately, the medical value of X-ray and CT exams far outweighs the known risk.

5. FACILITIES AVAILABLE:

The radiology department consists of the following facilities:

5.1 CT Scan:

The hospital is equipped with high resolution 64 slice CT scanner . It routinely performs whole body CT scan and all angiographies including CT coronaries. All CT guided drainage procedures, biopsy and intervention is performed in the department.

5.2 MRI:

The new MRI with a magnetic strength of 1.5 Tesla .

The first digital MR scanner, single digital broadband fiber optic cable independent of number of element/ channels in an RF coil, producing excellent image quality.

MR signal digitalization takes place in RF coil itself (first of its kind in MR technology), thus being as close to patient as possible and markedly reducing signal loss.

- 70 cms wider bore provides more space and helps to reduce anxiety issues in the patients.
- Acoustic noise is reduced by more than 80%.
- Light weight coils that are comfortable to the patients.
- The gantry table enables to scan patient weighing upto 250kgs.
- 40% improvement in signal to noise ratio resulting in better image quality.
- Multitransmit 4D adults as well as pediatrics cardiac imaging.

- Ultra-fast examination protocols with excellent image quality.
- Real time motion correction software to optimize images degraded by motion artifacts without use of sedation.
- Improved workflow with prior patient preparation and coil application outside the MR gantry room minimizing mobilization.

5.3 USG:

They have 2 USG machines one for conventional diagnostic purpose and other for Doppler studies. They in addition to this also have a mobile USG machine for emergencies after the department closes.

5.4 X-Ray:

They have 2 X- Ray digital machines in the department, and 1 portable X-Ray machine.

5.5 TYPES OF SCANS DONE:

- This department specializes in undertaking CT assisted procedures like biopsy and draining as well as diagnostic investigations of head, neck, spine, brain, abdomen, pelvis, extremities etc. they undertake both plain and contrast studies here.
- The MRI department specializes in plain and contrast studies of all organs and body parts.
- USG undertakes both conventional investigations as well as Doppler studies.
- X ray takes conventional Chest, KUB, etc.

5.6. REPORTING AND TYPING OF THE REPORTS:

- For the purpose of typing of reports, they have Dictaphone recording for CT and MRI reports , where the doctors record while reporting the scans and the recorded file is uploaded on a software used by the typist .The typists then receive the form filled by the patient at the registration counter with their details. On uploading of the recorded file, the

typists select the report consecutive with the name of the patient on the forms that they have. They then listen to the recording and make changes on the preformatted normal report.

- For USG, the typist take the dictation while the scan is going on as the reporting is done simultaneously, and then type the report in between the scans.
- For x ray, the typists go for verbal dictation to the radiologists and the type the reports.

OBJECTIVES

General Objectives:

To study the overall workflow process of radiology department at Park hospital.

Specific Objectives:

1) To study the moments of patient from arrival till departure from department.
2) To ensure quality care of patient in the radiology.
3) To observe the safety protocols followed for patient and staff in radiology department.

REVIEW OF LITERATURE

1.G Marshall, S Keene. *Radiation Safety in the Modern Radiology Department: A Growing Concern*. The purpose of this research paper is to reiterate the importance of radiation protection in the radiology department. Recent studies of 146,022 certified radiologic technologists indicate radiation workers may be at a greater risk of developing breast cancer or leukemia. The effects of ionizing radiation can either be classified as stochastic (random) or deterministic (nonrandom). Through radiation protection, deterministic effects may be prevented and stochastic effects may be reduced.

2. Diego Falsini, Arianna Perugia,Massimiliano M. Schiraldi An Operations Management Approach forRadiology Services. This paper focus on the application of Operations Management techniques in the context of radiological and diagnostic imaging services provision. More specifically, the outpatient appointmentscheduling problem for MRI diagnostic imaging services in radiology clinics is approached and solvedtaking into account set-up time minimization. This is pursued trough the design of an innovative system forthe on-line assignment of appointments for specific diagnostic imaging scans. An appointment rule, a patientclassification and an heuristic procedure for the booking process are defined in order to better manageuncertainty and improve system performance. The proposed approach was validated on the case of adiagnostic centre of Alliance Medical, a primary multinational company in the field of diagnostic imaging services

3. Giles W. L. Boland[1], Elkan F. Halpern and G. Scott Gazelle Radiologist Report Turnaround Time: Impact of Pay-for-Performance Measures Expedited finalized radiologist report turnaround times (RTAT) are considered an important quality care metric in medicine. This study was performed to evaluate the impact of a radiologist pay-for-performance (PFP) program on reducing RTAT. A radiologist PFP program appears to have a marked effect on expediting final report turnaround times, which continues after its termination.

4. Another study was carried at Massachusets General Hospital in the late sixties, through which the researcher identified two problems in the Departments of Diagnostic Imaging: the planning of examinations and the management of picture archiving. They said that the primary aim of a RIS is always been clinical, organizational and administrative service improvement. But it is also useful for the solution of those 2 problems (the planning of examinations and the management of picture archiving). With the development of RIS now it is considered as an effective tool to support the daily activities and to tackle & solve the operational problems. A RIS is essentially concern with 3 major functional areas – patient management, procedure management and department management. Another major task of RIS is it has to be integrated with other information systems of radiology and hospital, which enable it to share its information in real time with the hospital information system. This saves time for transmission.

METHODOLOGY

Study Area:

Park Hospital, Faridabad.

Study Duration:

10th January to 10th April

Study Design:

Descriptive Cross Sectional study

(Cross-sectional studies are descriptive studies .One of the most common and well-known study designs is the cross-sectional study design. In this type of research study, either the entire population or a subset thereof is selected, and from these individuals, data are collected to help answer the research questions of interest. It is called cross-sectional because the information about X and Y that is gathered represents what is going on at only one point in time. The benefit of a cross-sectional study design is that it allows researchers to compare many different variables at the same time.)

Study Population:

OPD & IPD Patients.

Sample Size:

Total sample: 500 patients.
X-RAY-200
USG-150
CT-75
MRI-.75

Sampling techniques:

Convenient sampling (Non Probability Sampling)

(As the respondents were selected as per the convenience of the researcher, patient's availability and willingness. Non Probability Sampling as the chance of getting selected was not even amongst the sample size chosen.)

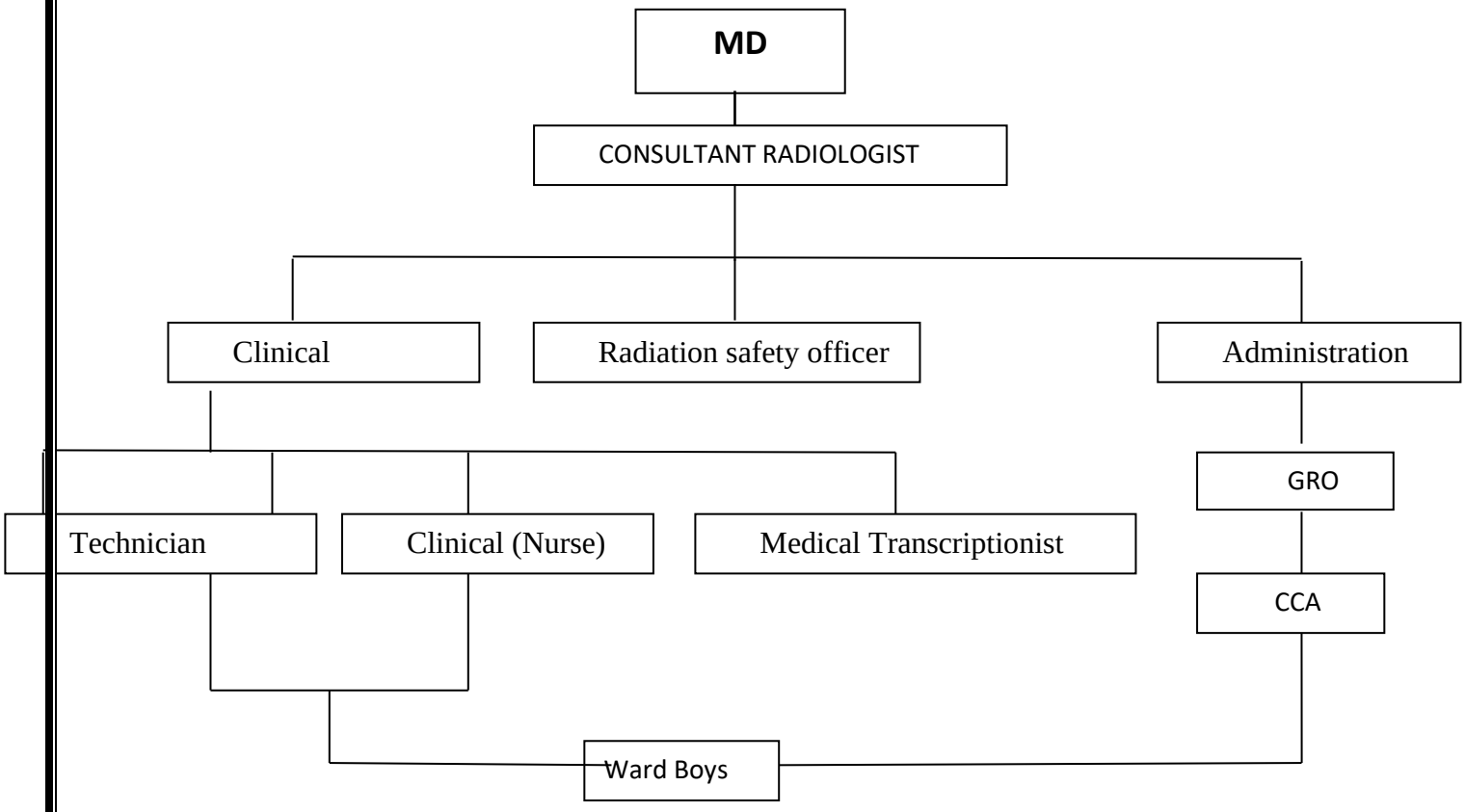
Data Collection Tool & Techniques:

Primary data collection: Observation.

Secondary data collection: Park Hospital Manual and website.

Study Findings

ORGANOGRAM OF RADIOLOGY DEPARTMENT:



6.2 WORKING DAYS FOR STAFF- Monday-Saturday

6.3 RADIOLOGISTS/DOCTORS:

- The Radiology Department is headed by HOD Radiology, consists of 1 senior radiologist who works from 10-5pm, and 1 full time Radiologist.
- There is 1 sonologists taking care of the USG facility who works in a straight shift.

6.4 TECHNICIANS:

- 5 technicians for CT and MRI both, 8 for X ray including.
- Technicians in MRI and CT scan have different work timings. They also work on Sundays on a rotator basis. They are kept on call basis for any emergency arising at night.
- For USG and X-ray, any emergency case at night is dealt by the resident on call with the help of the portable machine. X ray has 1 technician for night.
- Each technician gets one weekly off.

6.5 ADMINISTRATION:

- Headed by manager radiology and marketing and one assistant manager radiology who work in straight shifts Monday to Saturday.

6.6 TYPISTS:

- 1typists for x ray, USG , CT scan and MRI.

6.7 REGISTRATION:

- Two people for registration and dispatch of reports, who also take care of appointments and inquiries for CT scan, MRI.

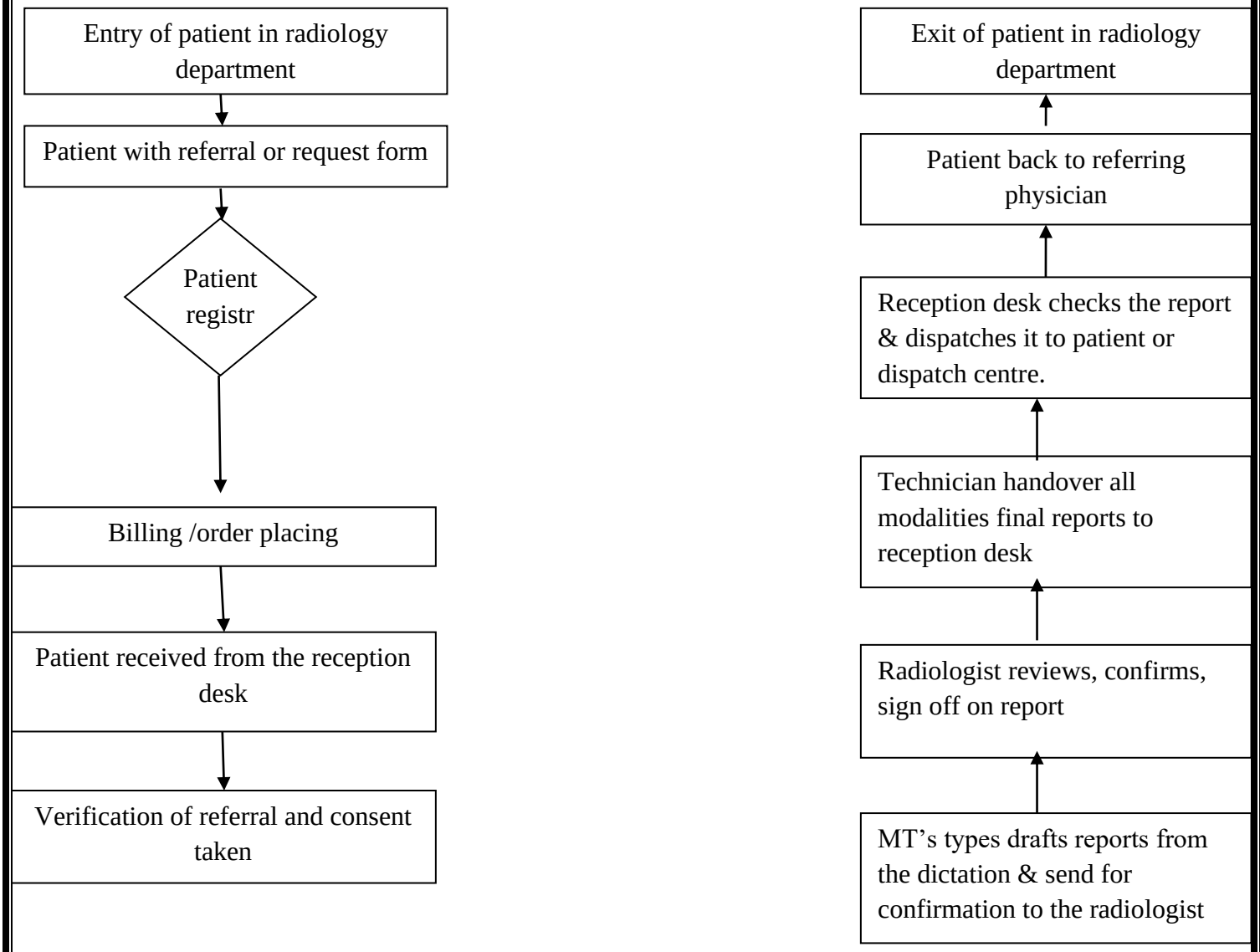
6.8 NURSES:

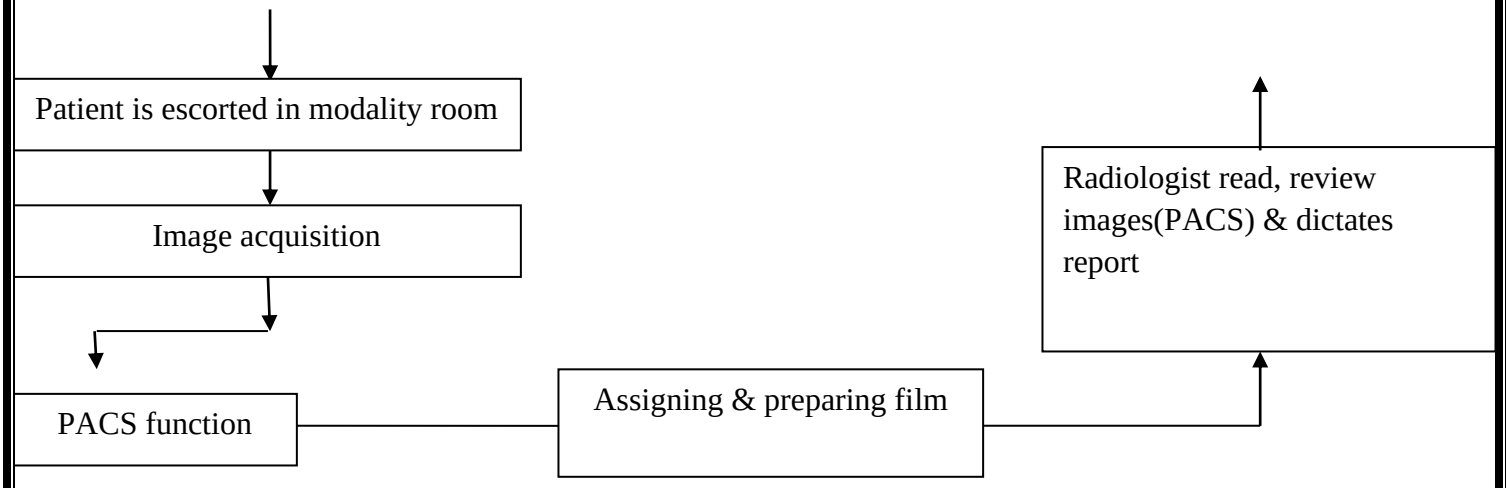
- There are 3 nurses in radiology department

6.9 WARD BOYS:

- 2 ward boys work in radiology who works in different shifts starting as early as 8.30 am and as late as 7 pm.

7.5 General process flow in radiology department:





7. PROCESS MAPPING OF RADIOLOGY DEPARTMENT:

7.1 X RAY :

- No appointment system followed. Patients are served on first come first served basis.
- IPD patients are taken in between as and when a requirement comes from the IPD.
- Emergency patients are taken in between as and when the emergency comes.

REGISTRATION AND BILLING

- PATIENT COMES TO RADIOLOGY FRONT DESK WITH THE PRESCRIPTION AND REQUESTS FOR AN XRAY
- RIS SCHEDULING AND BILLING DONE AND SEND REQUEST TO THE TECHNICIAN

SCANNING

- PATIENT IS CALLED IN BY THE WARD BOY BY CALLING OUT THE NAME.
- THE PATIENT IS TAKEN IN FOR THE SCAN

REPORTING AND REPORT DESPATCH

- CASES ARE NOT REPORTED SIMULTANEOUSLY. THE RADIOLOGIST WHO REPORTS THE X RAY WAITS FOR SOME X RAYS TO ACCUMUATE BEFORE REPORTING.
- DICTATION IS TAKEN WHILE THE DOCTOR REPORTS THE X RAY FILMS.
- AFTER DICTATION ALL THE REPORTS ARE TYPED BY THE TYPISTS
- FOR RECHECKING, THE REPORTS AND FILMS ARE SENT BACK TO THE RADIOLOGIST AND THEN SIGNED .
- THE WARD BOY TAKES THE SIGNED REPORTS TO THE DISPATCH COUNTER .
- EMERGENCY X RAY REPORTING IS DONE AT THE TIME OF THE SCAN AND COMMUNICATED AT THE SAME TIME BY WRITING ON THE FILE.

7.2 USG:

REGISTRATION AND BILLING

- PATIENT COMES TO RADIOLOGY FRONT DESK WITH THE PRESCRIPTION AND REQUESTS FOR AN USG
- RIS SCHEDULING AND BILLING DONE AND SEND REQUEST TO THE NURSE IN USG DEPATMENT
- APPOINTMENT PATIENT GIVES FIRST PREFERENCE

SCANING

- PATIENT IS CALLED BY NURSE IN VERBALLY FOR USG AND SCAN IS DONE

REPORTING

- THE DR. SAMULTANEOUSLY READ AND DICTATE TO THE TYPIST WHO TAKES A WRITTEN DICTATION AND LATTER TYPE IN BETWEEN THE SCANS
- THE MEDICAL TRANSCRIPTIONIST TYPE THE REPORT AND SEND FOR CONFERMATION
- AFTER CONFERMATION REPORT IS DESPATCHED BY THE NURSE

DESPATCHING

- DESPATCHING REPORT BY SISTER.

7.3 MRI

APPONTMENT SYSTEM

- MRI WORKS ON APPOINTMENT BASIS WHICH HAS TO BE TAKEN A DAY IN ADVANCE. EMERGENCY , IPD AND CRITICAL CARE PATIENTS ARE ALSO ENTERTAINED IN BETWEEN BY APPOINTMENT

REGISTRATION AND BILLING

- MRI REGISTRATION AND BILLING IS DONE ON THE DAY OF THE SCAN

SCANNING

- MRI PATIENTS ARE CALLED VERBALLY BY THE WARD BOY AFTER THE TECHNICIAN TAKES A HISTORY .THE PATEINT IS THEN SENT TO CHANGE. THE NEXT PATIENT IS KEPT READY TO TAKE IN THE BAY AREA AS THE PRIOR SCAN IS ONGOING

REPORTING AND TYPING

- MRI REPORTING IS DONE AND RECORDED ON DICTAPHONE AND THEN UPLOADED ON THE COMPUTER FOR THE TYPIST TO TYPE.AFTER TYPING REPORT SEND FOR CONFERMATION TO THE ASSIGNING DOCTOR.

DESPATCHING

REPORT IS DESPATCHED BY THE TECHNICIAN AFTER CONFERMATION OF REPORT BY THE DOCTOR.

7. 4.CT SCAN

APPONTMENT SYSTEM

- CT SCAN WORKS ON APPOINTMENT BASIS WHICH HAS TO BE TAKEN A DAY IN ADVANCE. EMERGENCY , IPD AND CRITICAL CARE PATIENTS ARE ALSO ENTERTAINED IN BETWEEN BY APPOINTMENT

REGISTRATION AND BILLING

- CT REGISTRATION AND BILLING IS DONE ON THE DAY OF THE SCAN

SCANNING

- CT PATIENTS ARE CALLED VERBALLY BY THE WARD BOY AFTER THE TECHNICIAN TAKES A HISTORY .THE PATEINT IS THEN SENT TO CHANGE. THE NEXT PATIENT IS KEPT READY TO TAKE IN THE BAY AREA AS THE PRIOR SCAN IS ONGOING

REPORTING AND TYPING

- CT REPORTING IS DONE AND RECORDED ON DICTAPHONE AND THEN UPLOADED ON THE COMPUTER FOR THE TYPIST TO TYPE.AFTER TYPING REPORE SEND FOR CONFERMATION TO THE ASSIGNING DOCTOR.

DESPATCHING

- REPORT IS DESPATCHED BY THE TECHNICIAN AFTER CONFERMATION OF REPORT BY THE DOCTOR.

SAFETY PROTOCOLS FOLLOWED FOR PATIENT AN STAFF IN RADIOLOGY AT PAR HOSPITAL:

8.1 Safety & Security Procedures within the Department of Radiology & Imaging:

The Department of Radiology & Imaging provides for the safety and security of all patients, employees and visitors in regard to medical imaging including interventional procedures performed under imaging guidance and use of contrast agents for enhanced imaging outcomes. At Park hospital, administrative controls and oversight are in place to establish policies and procedures which assure safety and security.

8.2 Proactive Measures to Assure Safety and Security for Patients:

General:

Patient identification

Each patient is required to have written orders from their physician identifying the requested imaging exam and/or interventional procedure. Custom order forms are generated by the Department and are offered to each referring physician and are encouraged to be used to improve efficiency and decrease the possibility of communication errors.

Correct patient identification is ensured by using two approved specific identifiers, patients must: spell their name and registration in hospital.

Patient Privacy and Dignity

Information regarding imaging examinations and/or procedures is available on the hospital and Department of Radiology website for patients to review.

Each patient is given an individual dressing room. Private restroom facilities are adjacent to the radiographic rooms.

Patient Responsibilities

The patient must provide, to the best of his/her knowledge, accurate and complete information regarding all matters relating to their health care, including:

- Nature of the present complaint

- A brief medical history pertinent to the particular exam is requested from the patient by the technologist and/or radiologist
- Past illnesses/hospitalizations
- Unexpected changes in condition since last examination or visit to referring physician
- If scheduled for a procedure, medications (prescribed and over the counter)

A patient is responsible to make known whether or not he/she clearly understands the reason for the examination/procedure and their role in that process. The patient is also responsible to follow established rules and regulations, especially as they affect patient care. This responsibility includes consideration for the rights of other patients and personnel and respect for their property, and assistance in the hospital's efforts to limit noise and smoking. It is also a patient's responsibility to be mindful of the number and behavior of those accompanying them.

All female patients of child bearing age scheduled for a conventional x-ray, CT, fluoroscopy, MR or non-US image guided interventional procedure are asked if they are or think they might be pregnant. If the possibility of pregnancy exists, the patient is informed of options, risks and alternatives. If pregnant, the patient is informed of the risks and the patient's obstetrician is consulted.

8.3Imaging Modalities - Definitions, Risks, and Safety Measures for each Modality:

Ionizing imaging modality:

X-rays:

Definition: X-rays use invisible electromagnetic energy-ionizing radiation to produce images of the body, including bones, joints, and soft tissue.

Risks: Radiation during pregnancy has the potential of producing birth defects so it is important to avoid ionizing radiation if there is a suspicion or actual knowledge of being pregnant. Particular caution should be exercised during the first trimester. A patient who is pregnant or suspects there is a possibility of being pregnant will not be examined without the recommendation of a radiologist and consultation with the attending gynecologist/obstetrician.

Safety Measures:

Every effort is made to keep radiation exposure as low as practicable. Dosage utilized is according to ALARA (individual and collective doses must be As Low As is Reasonably Achievable).

All patients receive gonadal shielding provided the shielding does not infringe upon the area of primary diagnostic interest. The department has wraparound, full and half aprons, breast shields, and both male and female gonadal shields (Thyroid Shields).

Computed Tomography (CT):

Definition:

Computed Tomography (CT) uses ionizing radiation to capture thin section axial images and computer processing to create cross-sectional images of bones, joints, and soft tissues.

CT provides highly detailed information of the spine, joints, and soft tissues (including soft tissue calcifications). Additionally, CT provides detailed images related to abnormalities of the abdomen, pelvis or head.

Special protocols are used to visualize each area of the musculoskeletal system. CT is also used to guide procedures such as diagnostic and therapeutic interventional procedures including, facet joint injections, nerve blocks, and biopsies.

Risks and Safety Measures:

The risks and safety measures are the same as described under x-ray and every effort is made to minimize dosage. Exposure factors appropriate to patient body size and thickness to minimize dose while optimizing image quality are utilized. Specific pediatric imaging protocols for infants and children are used and based on patient size and weight.

Non-Ionizing Imaging Modalities:

Ultrasound:

Definition:

Ultrasound or sonogram (US) uses high frequency sound waves to image soft tissues (e.g. tendon, ligaments, neuromas, bursas etc.) and blood flow. US is also used to guide both diagnostic and therapeutic interventional procedures.

Risks:

No ionizing radiation is involved. Ultrasound is very safe.

Safety Measures:

Precautions are mainly for instrument and field sterility and physical safety.

Magnetic Resonance Imaging

Definition:

Magnetic resonance imaging (MRI) uses high strength magnets and radio waves to send and receive signals to a specific body part. A computer then converts these signals into images. High resolution MR imaging is used to demonstrate fine detail of articular cartilage, tendons, peripheral nerve, and other soft tissue structures that are not typically demonstrated on routine MR exams.

Risks:

Because ionizing radiation is not used. MRI is safe in the majority of patients; however, certain patients may not be able to have an MRI. Patients who are at risk during an MRI examination include people suffering from claustrophobia (nervousness in small spaces); people with implanted medical devices such as aneurysm in the brain, heart pacemakers and cochlear (inner ear) implants; and people with pieces of metal close to or in an important organ (e.g. the eye). Any patient who is pregnant or suspects there is a possibility of being pregnant will not be scanned or enter the restricted magnetic field area without the recommendation of a radiologist and consultation with the attending gynecologist/obstetrician. As with ionizing radiation, particular caution should be exercised during the first trimester.

Safety Measures:

Patient's specific areas of discomfort/pain are requested in order to verify that the procedure ordered is appropriate for the patient's condition.

To insure that MRI incompatible clothing or jewelry are not present in the MRI field the following precautions are taken:

- All patients wear examining gowns, are given a locker and instructed to remove all clothing, jewelry and MRI incompatible items

- Metal objects like watches, credit cards, hair pins, writing pens, etc. which may be damaged by the MRI scanner or may be pulled into the MRI are removed
- A comprehensive patient intake form is used to screen for magnetic safety and identification. Previous experiences and/or conditions that could be harmful to the patient and/or equipment during an MR scan are part of the intake form

The MRI technologist reviews the consent form with the patient to insure magnetic safety and verify the patient's symptoms with the scanning protocol to be performed. Patients, relatives, caregivers and other persons accompanying the patient during the MRI exam are also screened and required to fill out an MRI consent form

8.4 Radiographic/Imaging Contrast Agents:

Definition:

Radiographic/imaging contrast agents are used to increase sensitivity and specificity of diagnostic accuracy and to help guide and confirm location of diagnostic and therapeutic procedures. Radiographic x-ray contrast agents usually contain barium or iodine. MR contrast agents contain gadolinium. US contrast agents contain micro bubbles.

Risks:

- Some have allergic reactions to iodine or gadolinium
- Extravasations.

Safety Measures:

Pre-contrast Questionnaires:

In order for a patient to receive contrast, a written order is required. Contrast assessment and IV contrast agent form is completed by the radiologist/fellow. A power injector, used in CT for the delivery of IV contrast media, is operated by a trained healthcare professional.

Contraindications

- No intravenous access

- Hemolytic anemia
- Severely impaired renal function as evidenced by GFR < 30. Any impairment of kidney function when accompanied by chronic liver disease where the patient is immediately about to undergo or has recently undergone liver transplantation.

8.5 Patients receiving contrast are monitored for:

Allergies:

Patients will be monitored for mild to severe allergic reactions (e.g. headaches, flush, allergic skin reaction, severe anaphylactic reaction or convulsive attack). Individuals with a history of prior severe contrast reaction will either have the exam performed without contrast or in certain cases will have it performed with contrast after a course of premedication with steroids and antihistamine. Patients with known history of contrast allergy are assessed and pre-medicated per departmental policy. The premedication is started a day or so before the exam.

At the first suspicion of anaphylaxis, the MD is contacted and the airway, breathing and circulation are assessed.

Extravasations - Guidelines for Treatment of Extravasated Contrast Media

The site of swelling from the extravasated contrast will be circled with a marker Patient is given care instructions of this site. Most patients improve over 24-36 hours. If after 36-48 hours there is continued improvement, the likelihood of any subsequent problems are very low.

Surgical treatment is only reserved for patients who experience necrosis and skin sloughing which would be evident by this time.

8.6 Employee and Visitor Safety Measures:

Safety procedures provide confidence that the department maintains a safe environment for patients, visitors, physicians, and employees to prevent accidents or injuries.

Employee Safety Responsibility

The employee is responsible for patient, visitor and fellow employees' personnel safety and is expected to practice safe work procedures in accordance with the Radiology Department's safety policy. Personnel are expected to:

- Maintain good personal hygiene; hand washing is expected before and after contact with patients (before going on breaks and at mealtime, after using restrooms, etc.)
- Be free from communicable disease
- Report safety hazards to their immediate supervisor including, but not limited to: observations of unsafe acts or conditions and defective/malfunctioning equipment
- Perform their job function in such a manner that will not cause injury to themselves and/or others or that will cause property damage
- Obey all warning signs, tags and notices and move cautiously when pushing portables and carts of any kind, especially when approaching a blind corner.
- Follow proper procedures and specific methods when handling/moving patients, particularly as they relate to back care
- Report injuries to supervisor as soon as is feasibly possible after an incident

8.7 Safety with Regard to Equipment Use and Monitoring:

All diagnostic x-ray equipment is used under the direction and/or supervision of a diagnostic radiologist. Only trained persons licensed by the Department of Health shall be authorized to make radiographic exposures of a patient.

8.8 Ionizing Radiation Protection

Equipment Safety

All diagnostic radiologic equipment (fixed and mobile) is calibrated by a qualified physicist. Calibrations occur annually, at the least. All equipment is scheduled for preventative maintenance checks by service engineers. Technologists check the equipment before each patient use.

The exposure switch of each fixed x-ray diagnostic unit (x-ray room) has an electrical connection with the door, such that an exposure cannot be made unless the x-ray room door is closed.

Equipment malfunction of any kind requires the patient to be transferred to another x-ray room for completion of the exam. Any malfunction of equipment is to be communicated to department personnel responsible for equipment service

Personnel Safety

Whenever possible, mechanical devices only (e.g. tape, velcro straps, etc.) shall be utilized to immobilize patients during radiology procedures. Employees are not to hold children. No radiological (x-ray or nuclear) technologist or female in the procreating age shall hold a patient. A family member who is not pregnant will hold the child.

The location of the crash carts and other emergency carts are known by all department employees.

New personnel are trained in radiation safety practices such as maximizing the distance and minimizing the time at the radiation source, wearing protective apparel (i.e. lead aprons, gloves, and glasses), and using proper collimation. Annual Radiation Safety In-service with documentation of staff attendance is required.

Lead aprons must be worn by all personnel present during a x-ray examination. All lead gloves, aprons, and gonadal shields are inspected regularly for safety defects. When using x-ray equipment employees are in an enclosed control booth and behind lead glass.

Occupational Dose Program

Radiation monitoring badges (TLD) must be worn at collar level by all radiation workers at all times. Distribution and collection of the badges for routine processing will be the responsibility of the Radiation Safety Officer. Results of radiation dose monitoring are reviewed monthly by the radiation physicist, and are available for review upon request.

At no time will a badge be exposed to radiation unless worn by the individual to whom it is issued. Any infraction of this rule may result in the loss of that person's privilege to work with radioactive material and/or ionizing radiation.

The personnel who are subjected to radiation exposure due to radioactive material will be furnished a thermo luminescent dosimeter to be worn at the colla. The records of exposure reported on these dosimeters will be kept by the Radiation Safety Officer on forms

8.9 Non-Ionizing Radiation Protection

Ultrasound (US): Preventive maintenance is performed on a regular basis by an authorized service engineer. This is a requirement on all ultrasound equipment.

Magnetic Resonance Imaging (MRI): Scheduled preventive maintenance on the MRI scanner is performed by contracted service personnel.

Restricted Magnetic Field Area

To insure safety of both personnel and the magnet, access to the area around the magnet is controlled. This area includes the magnet room, the control room, the computer room, and all other adjacent rooms within the immediate area. The MRI technologist is responsible for all equipment and personnel entering this area. Because of the effects of the static magnetic field, all personnel and visitors are thoroughly screened for contraindications to MRI before entering the magnetic field area or magnet room. No one with a pacemaker or other implanted device is allowed to enter the restricted magnetic field area.

No metal objects are permitted to be in or on a person when entering the restricted magnetic field.

Guidelines to insure the safety of housekeeping personnel when performing their responsibilities, as well as to insure the protection of the magnet are enforced. Additionally, a plan to correctly handle emergency situations in the magnet room is enforced in order to avoid injury and damage to the magnet.

Administrative Oversight and Maintenance Policies for Equipment, Education and Employee Safety Measures with Regard to Assuring Safety Associated with Medical Imaging Including Interventional Procedures Performed Under Image Guidance.

The Radiation Quality Assurance Committee meets quarterly to monitor the safety program and to make recommendations for ensuring a safe work environment. The members conduct monthly walk through inspection tours and develop programs for the ongoing training of employees. In-service education is given on a regular basis within the department.

The Radiation Safety Committee is a standing subcommittee of the Radiology Department's Quality Assurance Committee that also meets quarterly.

Responsibilities include:

- Reviewing/recommending policies regarding ionizing radiation safety and implementing such recommendations to the Board of Trustees through the Medical Board.
- Providing technical advice to the Radiation Safety Officer on matters regarding radiation safety.
- Receiving, reviewing and acting on all applications for the use of machines capable of producing ionizing radiation and using radioactive materials in humans.
- Reviewing all incidents of alleged infractions of use and safety rules with the Radiation Safety Officer and the responsible user (if necessary, the Committee has the authority from the Board of Trustees, through the Medical Board, to stop or restrict the use of radioactive materials by the user until the infraction is corrected)

DATA ANALYSIS AND DATA PRESENTATION ON AVERAGE PATIENT WAITING TIME AT RADIOLOGY DEPARTMENT

Waiting time:

Waiting time is the time from which the patient has come to the department, till the time that the test is initiated.

Sample size - 500

X-RAY-200
USG-150
CT-75
MRI-.75

Table No.1 Showing score for X ray waiting time

WATING TIME	PATIENT	%
5-30min	182	91
30 min-1hr	17	8.5
1hr-2hr	1	0.5

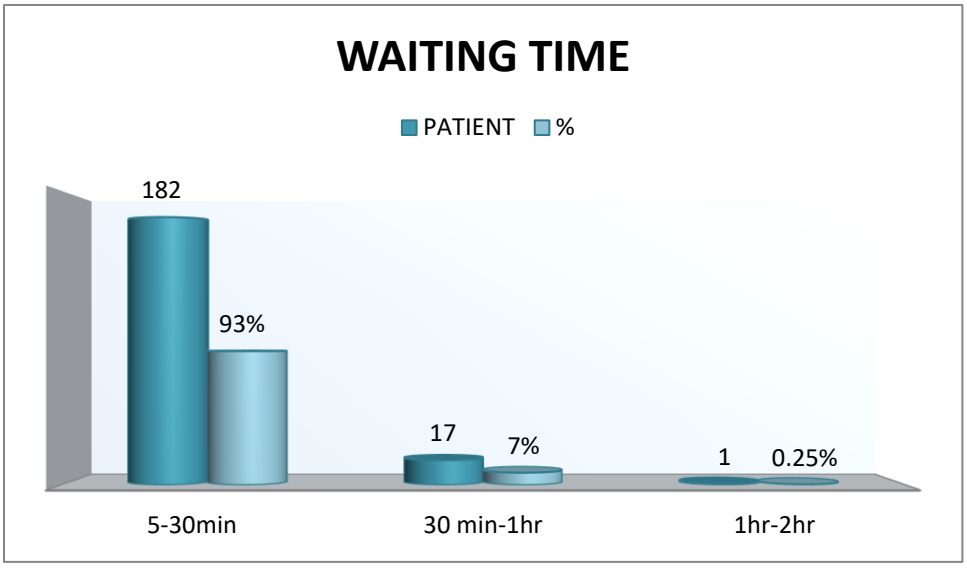


Fig No.1 Graphical Representation of X ray waiting time

Table No.2 Showing score for Dispatch time for X ray

DISPACH TIME	PATIENT	%
10min-1hr	64	32
1hr-2hr	72	36
2hr-3hr	33	16.5
3hr-4hr	26	13
4hr-5hr	5	2.5

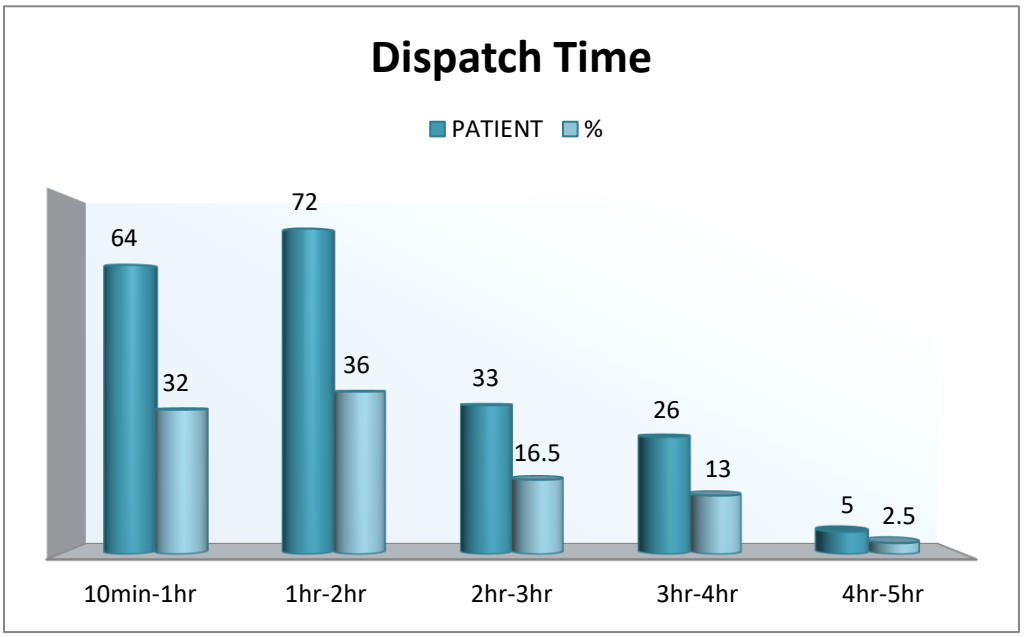


Fig No.1 Graphical Representation of Dispatching time for X ray

Table No.3 Showing score for Total time for X ray

TOTAL TIME	PATIENT	%
1hr-2hr	33	16.5
2hr-3hr	32	16
3hr-4hr	47	23.5
4hr-5hr	45	22.5
5hr-6hr	27	13.5
6hr-7hr	16	8

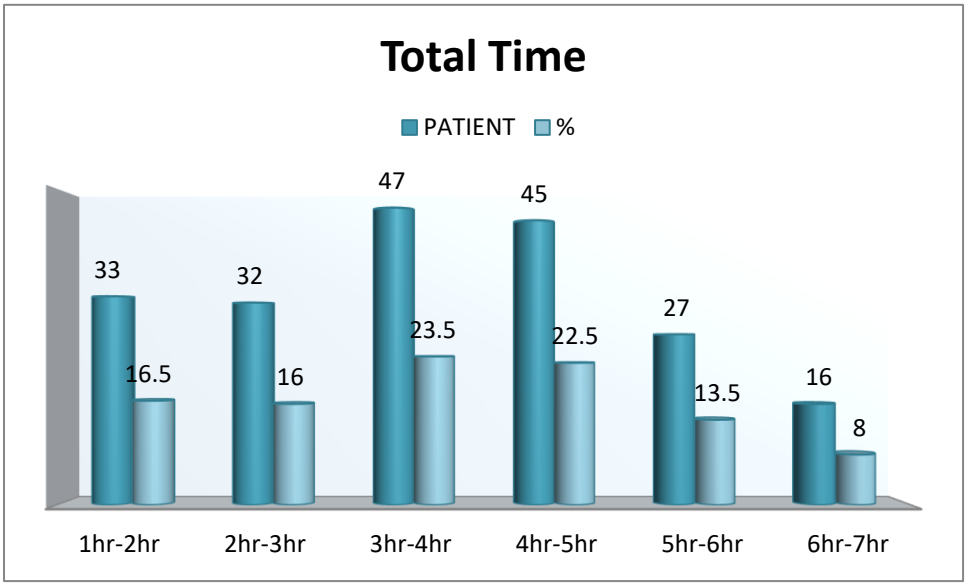


Fig No.3 Graphical Representation of Total tame for X ray

Table No.4 Showing score for Waiting time for USG

WAITING TIME	PATIENT	%
5-30min	57	38
30-1hr	52	35
1hr-2hr	37	25
2hr-3hr	4	3

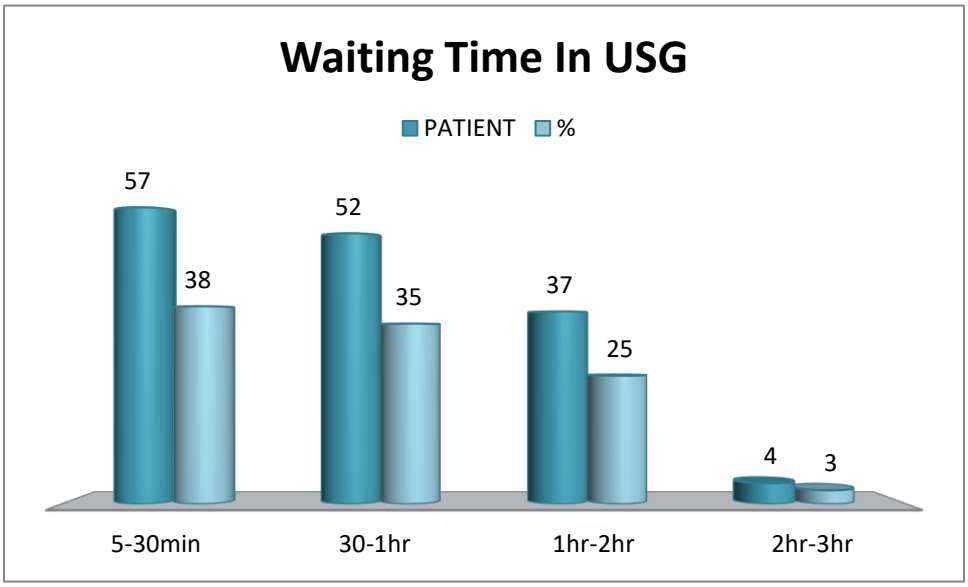


Fig No.4 Graphical Representation of Waiting time for USG

Table No.5 Showing score for Dispatch Time of USG

DESPACHING TIME	PATIENT	%
10min-1hr	65	43
1hr-2hr	48	32
2hr-3hr	24	16
3hr-4hr	6	4
4hr-5hr	7	5

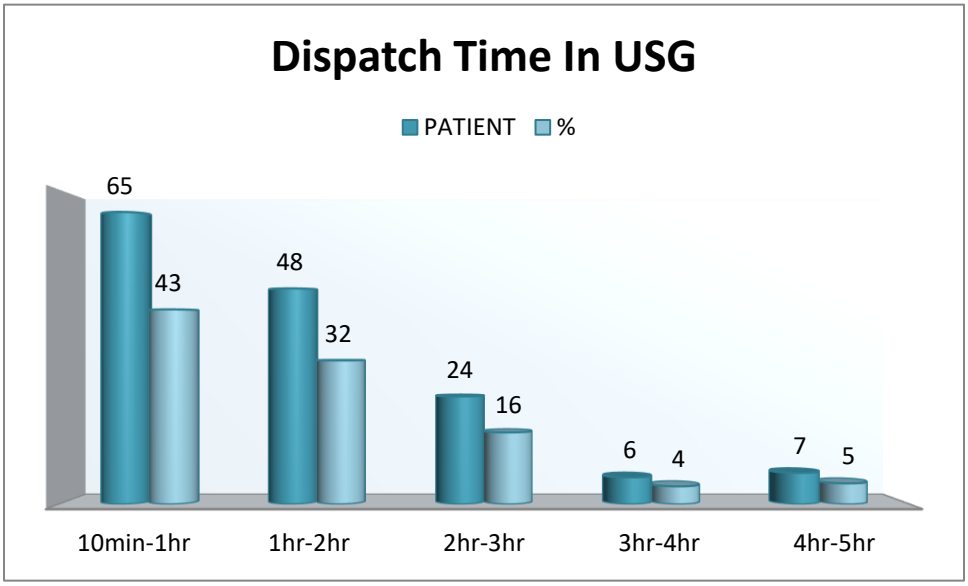


Fig No.5 Graphical Representation of Dispatch Time of USG

Table No.6 Showing score for Total Time for USG

TOTAL TIME	PATIENT	%
1hr-2hr	53	35
2hr-3hr	43	29
3hr-4hr	35	23
4hr-5hr	11	7
5hr-6hr	6	4
6hr-7hr	2	1

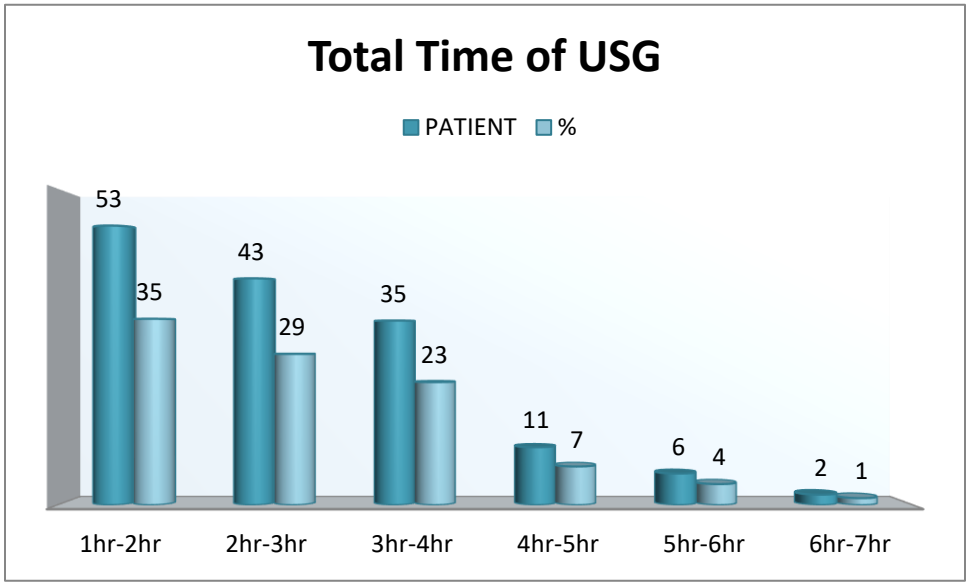


Fig No.6 Graphical Representation of Total Time for USG

Table No.7 Showing score for Waiting time for CT

WAITING TIME	PATIENT	%
5-30min	38	50
30min-1hr	23	31
1hr-2hr	10	13
2hr-3hr	4	5

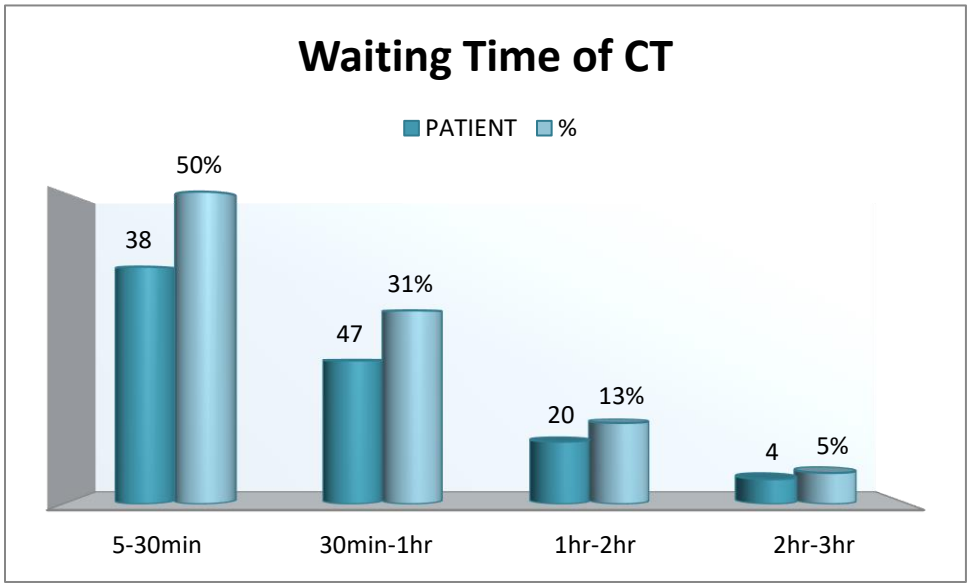


Fig No.7 Graphical Representation of Waiting time for CT

Table No.8 Showing score for Dispatch time in CT

DESPACHING TIME	PATIENT	%
10min-1hr	16	21
1hr-2hr	31	41
2hr-3hr	21	28
3hr-4hr	4	6
4hr-5hr	3	4

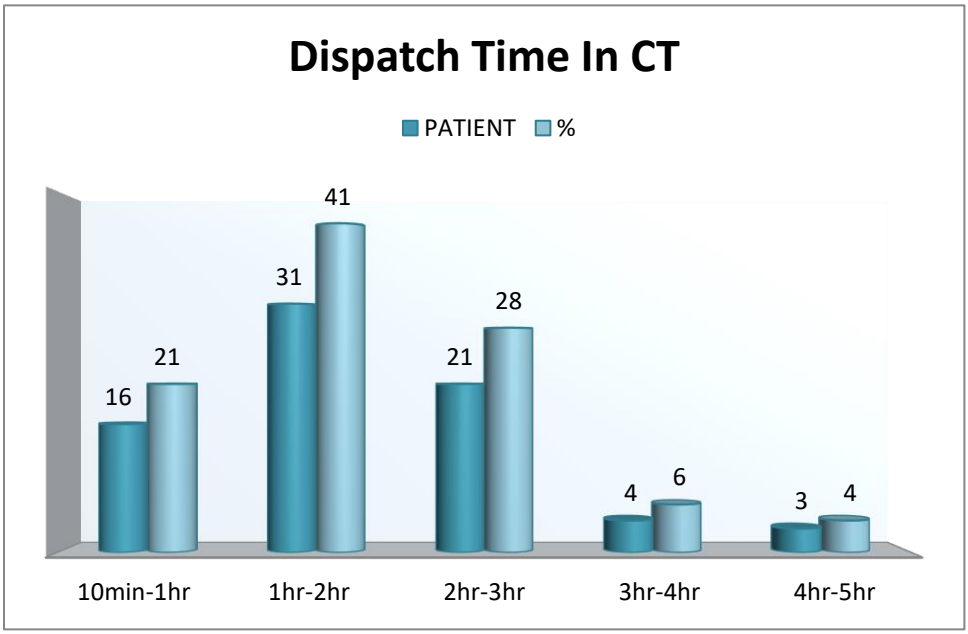


Fig No.8 Graphical Representation of Dispatch time in CT

Table No.9 Showing score for Total time in CT

TOTAL TIME	PATIENT	%
1hr-2hr	15	20
2hr-3hr	19	25
3hr-4hr	19	25
4hr-5hr	9	12
5hr-6hr	9	12
6hr-7hr	4	5

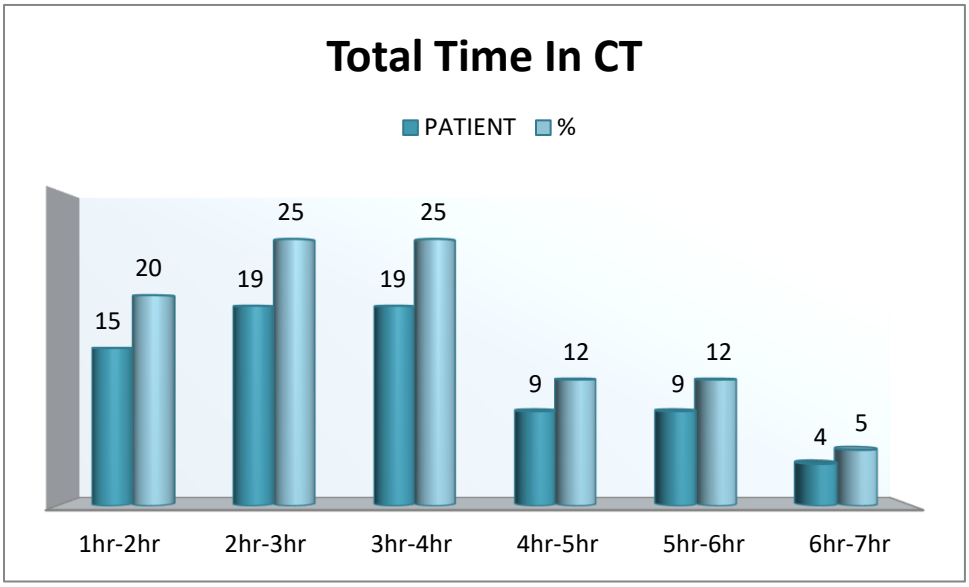


Fig No.9 Graphical Representation of Total time in CT

Table No.10 Showing score for Category of the patient coming to CT

CATEGORY	PATIENT	%
Appointment	40	53
IPD	30	40
EX	2	3
ER	3	4

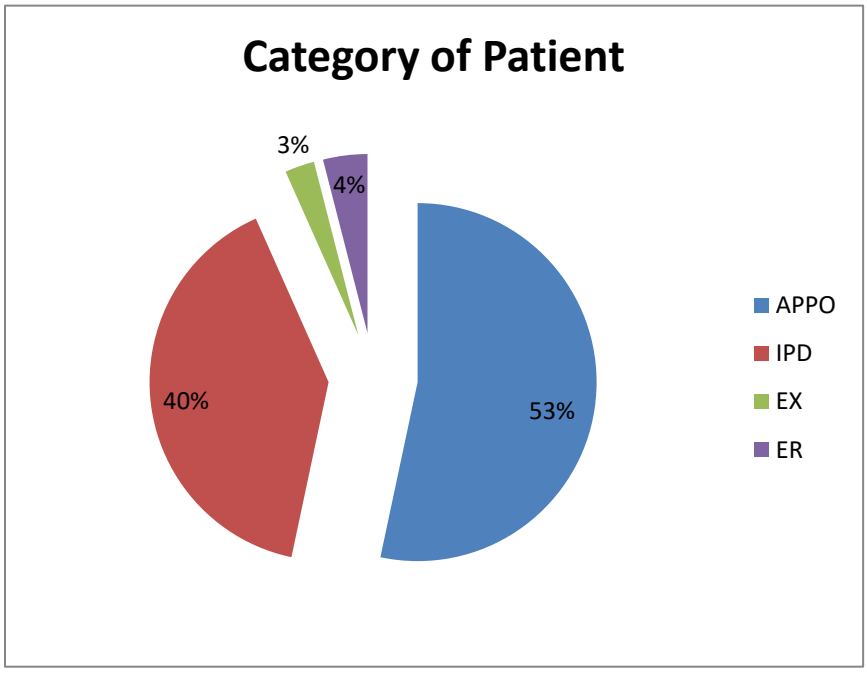


Fig No.10 Graphical Representation of Category of the patient coming to CT

Table No.11 Showing score for Waiting time in MRI

WAITING TIME	PATIENT	%
5-30min	44	59
30min-1hr	22	29
1hr-2hr	7	9
2hr-3hr	2	3

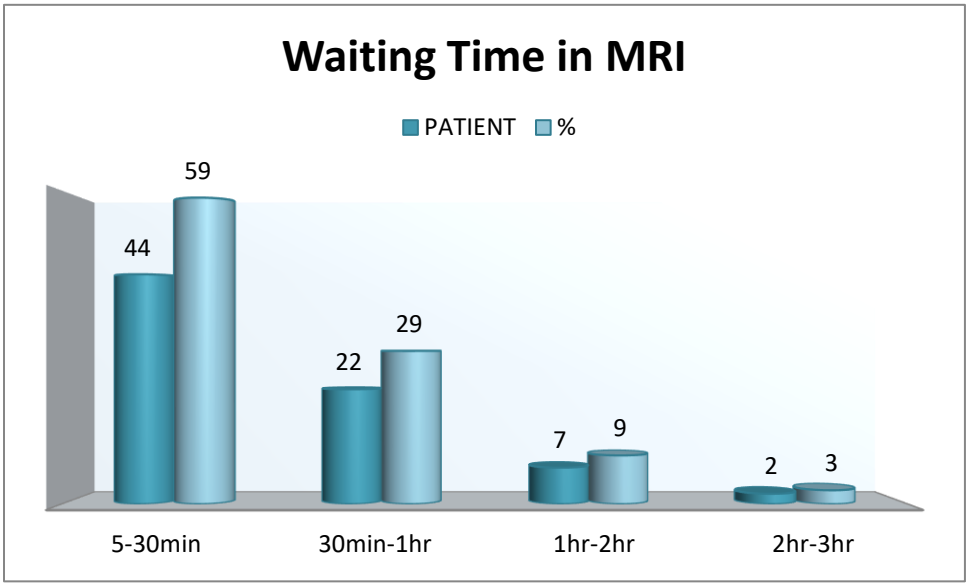


Fig No.11 Graphical Representation of Waiting time in MRI

Table No.12 Showing score for Dispatch Time In MRI

DESPACHING TIME	PATIENT	%
10min-1hr	29	39
1hr-2hr	26	35
2hr-3hr	12	16
3hr-4hr	6	8
4hr-5hr	2	3

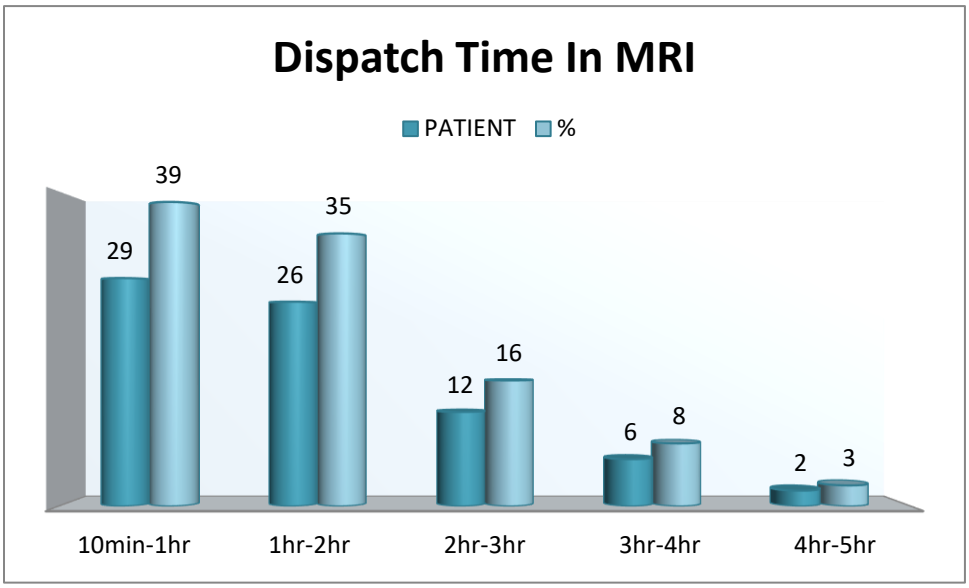


Fig No.12 Graphical Representation of Dispatch Time In MRI

Table No.13 Showing score for Total Time in MRI

TOTAL TIME	PATIENT	%
1hr-2hr	25	33
2hr-3hr	20	27
3hr-4hr	13	17
4hr-5hr	9	12
5hr-6hr	6	8
6hr-7hr	2	3

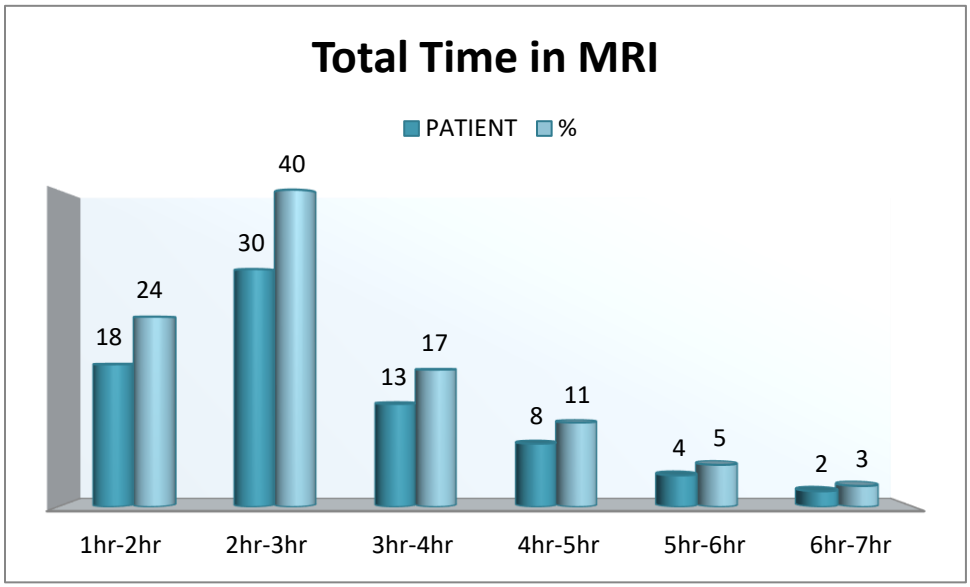


Fig No.13 Graphical Representation of Total Time in MRI

Table No.14 Showing score for Categories of patients

CATEGORY	PATIENT	%
APPO	45	60
IPD	22	29
ER	5	7
EX	3	4

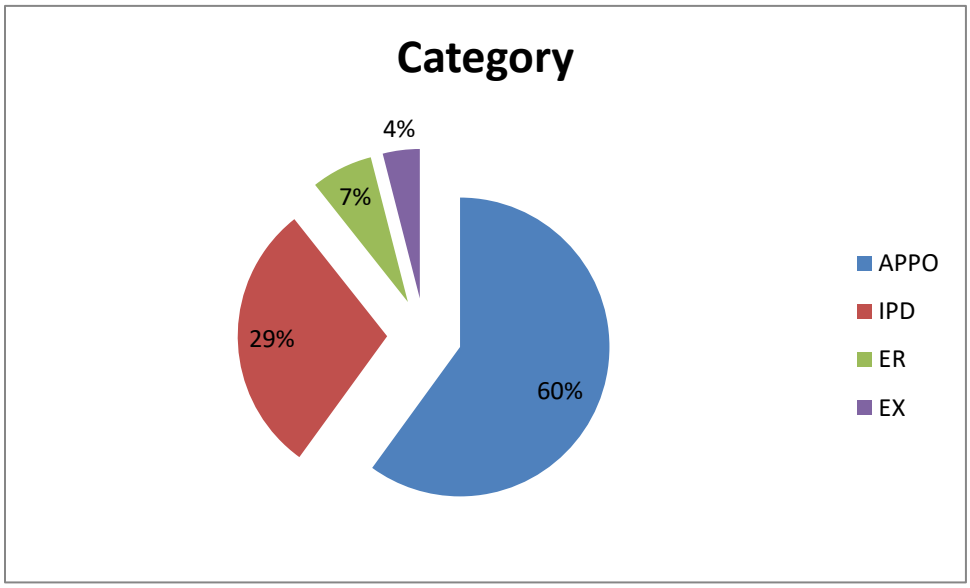


Fig No.17 Graphical Representation of Categories of patient

DISCUSSION

- Turnaround time of 500 patients were studied and it is found that turnaround time of radiology department is satisfactory i.e. 3 to 4 hrs.
- X Ray department achieve standard waiting time, dispatch time and turnaround time i.e. 30min., 2hr., and 3 – 4 hr. respectively.
- In USG department 38% achieve standard waiting time i.e. 30 min., 35% achieve 38%, dispatch time and turnaround time is 1 - 2hr., and 3 – 4 hr. respectively.
- In CT department 50% achieve standard waiting time i.e. 30 min., 31% achieve 30 -1hr waiting time, dispatch time and turnaround time is 1 - 2hr., and 3 – 4 hr. respectively.
- In MRI department 59% achieve standard waiting time i.e. 30 min., 29% achieve 30 -1hr waiting time, dispatch time and turnaround time is 1 - 2hr., and 3 – 4 hr. respectively.
- Delay in dispatching: reports are ready to dispatch but technician are busy in shooting x-ray & sister are busy in USG thus there is delay in printing reports, delay in dispatching.
- Delay in confirmation of report: MT (medical transcriptionist) comes after 12:30pm thus there is delay in typing reports, result in delay in confirmation of report.
  Sometimes the Full time consultant radiologist comes late thus there is delay in confirmation of report.
- Delay in reporting: Consultant Radiologist used to busy in another procedure hence there is delay in reporting as there is only radiologist in the department.
- Delay in billing: Sometimes only one receptionist handle the X-RAY, USG, CT, MRI billing, it creates rush around the reception, thus patient suffer from delay in billing.
- Lack of amenities: In radiology department for emergency or IPD patient's wheel chair are not available.
- Transport facility: Transport facility is very poor in radiology department, after calling it comes in 15-20min thus patient waits after procedure also.
- Housekeeping staff: Only two housekeeping staff in radiology and they are not available when they needed for e.g. for dispatching the report to the IPD.
  (as given in Graph Below)

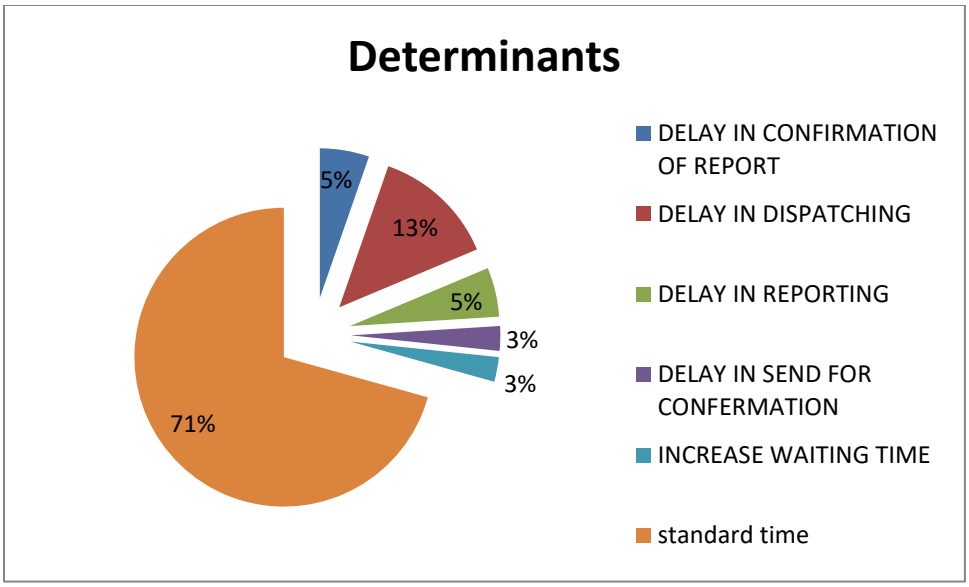


Fig No.18 Graphical Representation of overall determinants.

RECOMMENDATION

- There are 4 technicians available at x-ray department at afternoon hour, if they distribute their work (for e.g. printing of report) than the delay in dispatching should be minimized.
- There is only one MT in radiology department; there should be need of one more MT for typing of reports.
- Receptionist staffs are not trained, proper monthly training should be provided in radiology department.
- Dispatch time is not followed in radiology, it should be changed, should be under strict supervision.
- Reporting time should be maintained in X-RAY, USG, CT, and MRI.
- No token system for USG creates confusion and dissatisfaction among patients, there should be token system followed in radiology department. Adopting token system reduces confusion of sequence number of next patient for consultation in at radiology.

CONCLUSION

- Study shows that radiology department is following all the safety protocol for patient as well as for staff as per radiology guidelines.
- A thorough mapping of the existing process flow and analysis of 500 patients in radiology were conducted.
- Results revealed that in its current form, almost all Radiology processes achieved effective patient waiting time management except USG.
- USG department does not achieved standard waiting time management.
- Appointment patients are more in CT and MRI, the process needs little more improvement.
- These issues some time causes patient to overstay at waiting hall. Obtained results indicate that organizational changes and some more improvement (increase manpower, adopting token system for USG etc.) will lead to process effective, smoother and substantial economic benefits.

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