

**Summer Training at
Max Super specialty Hospital, Saket, New Delhi
(April 1–May 31, 2014)**

- **Utilization of Radiology Services**
- **Oncology Day Care Process Flow And Identify Bottlenecks**

**By
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**Under the guidance of
Dr. Tanjul Saxena**

**MBA- Hospital & Health Management (MBA-HM)
2013-2015**



**The IIHMR University, Jaipur
2014**

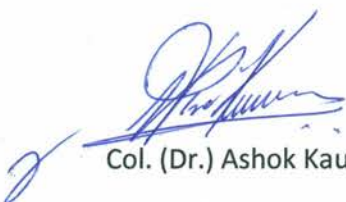
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CERTIFICATE

This is to certify that Dr.Prashansa Dubey has undergone her summer training in Max Superspeciality Hospital, Saket, New Delhi from 1st April, 2014 to 31st May, 2014. The candidate herself carried out all the studies related to her summer training. Her approach to the study has been scientific and analytical. This summer training is partial fulfilment of course requirement is recommended for the award of post graduate diploma in hospital management.

I wish her success in all her future endeavours.



Col. (Dr.) Ashok Kaushik

Dean (Academic & Student Affairs)

IIHMR Jaipur



Mrs. Tanjul Saxena

(Associate Professor)

IIHMR Jaipur



Care for life



CERTIFICATE OF COMPLETION

This is to certify that

PRASHANSA DUBEY

has been associated as an

INTERN

with the department of

HOSPITAL ADMINISTRATION

for a period of

1st April 2014 To 31st May 2014

at

**Max Super Speciality Hospital
Saket, New Delhi**

"The Internship course is a Max certified course not affiliated to any National/International society".

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ACKNOWLEDGEMENT

I take this opportunity to express my gratitude to the people who has been instrumental in the successful completion of this project

I show my greatest regard to my mentor **Mrs Tanjul Saxena**(Associate professor,IIHMR,Jaipur) for helping me out and guiding me during my summer training.

I would like to express my deepest gratitude to **Dr.Sahar Qureshi(Assistant general manager-Operations) and Mr.Shihad Khader**(Program manager Oncology) at Max Healthcare,Saket,New Delhi for his excellent guidance, patience and providing great opportunity to work.

I would like to extend my thanks to **Ms.Anjali Marwah** (Manager, Radiology) who always guided me in difficult times of my work.

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ABBREVIATIONS

IP	Inpatient
OPD	Outpatient department
CPRS	Computerized patient record system
GDA	General Duty assistant
HIS	Hospital information system
TPA	Third party administrator
PCC	Patient care coordinator
PCE	Patient care executive
EWS	Economically weaker section

HOSPITAL PROFILE

The Max India Group is a multi-business corporate, driven by the spirit of enterprise and focused on people and service oriented businesses. The Company's vision is to be one of India's most admired corporate for service excellence – in what we do, how we do it and the positive impact we have on society and our stakeholders.

We 'Protect Life' through our Life Insurance subsidiary. Max Life Insurance, a Joint Venture between Max India and Mitsui Sumitomo, Japan;

We 'Care for Life' through our Healthcare company, Max Healthcare, a subsidiary of Max India Limited;

We 'Enhance Life' through our Health Insurance company, Max Bupa Health Insurance, a Joint Venture between Max India and Bupa Finance Plc, UK;

We 'Improve Life' through our Clinical Research business, Max Neeman Medical International, a fully owned subsidiary of Max India.

Max India recently entered the Senior Living business with Antara Senior Living, a fully owned subsidiary of Max India. From its past, Max India continues its interest in the manufacture of Speciality Products for the packaging industry through its subsidiary, Max Speciality Films

VISION

To be one of India's most admired corporate for service excellence- in what we do, how we do it and the positive impact we have on society and our stakeholders

MISSION

- Establish niche services businesses in life insurance, Healthcare, Health insurance and Clinical Research.
- Life insurance, Healthcare and Health insurance.....Convergence!
- Rank amongst top three players in each niche.
- Partner with best-in-class work leaders.
- Create service excellence in all businesses.

OBSERVATIONAL LEARNING IN DIFFERENT DEPARTMENTS:-

OPD (Out-Patient Department)

Each Institute of Max Saket Hospital has its own OPD area as well as IPD area / day-care area wherever applicable. Every OPD has a procedure room and its own Front Desk.

Appointments are centralized and are recorded on the Hospital Information Management System. As soon as appointments are fixed, a text message is sent to the patient confirming the appointment, and a reminder message is sent on the day before the appointment. No walk-in patient is turned away, and the staffs try to accommodate these patients between the appointments already scheduled for the day. Each OPD waiting area has the capacity to handle 70-100 patients waiting.

IPD (In-Patient Department)

- IPD is distributed over five floors (2nd-6th) in the east wing of Max hospital including a total number of 201 beds.
- The rooms available in IPD have the following structure of beds per room:
 - 6 in 1
 - 4 in 1
 - 2 in 1
 - Single Deluxe
 - VIP suite
- Every floor has a central nursing station with
 - Information Board covering:
 - Designation & Contact numbers of
 - Duty doctor
 - Administration Staff
 - Support Staff

EMERGENCY DEPARTMENT

Due to the unplanned nature of patient attendance, this department provides initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention, except for major burns. It is located at the ground floor with its own dedicated entrance and operates for 24 hours a day.

Ambulance- 2 ACLS (with CCTV camera for telemedicine) and 4 BCLS

Patients are either transferred to other departments or are discharged within 4 hours. Max Super Specialty Hospital, Saket had made a world record for management of MI patient in emergency department from entrance to the balloon time in cath lab, in less than 35 minutes.

OPERATION THEATRE

Operation theater complex of East wing is located on first and second floor. Operation theater complex has 11 operation theater assigned to various departments. Cardiac, oncology , bariatric laparoscopic, gynecology, ENT and plastic surgeries are performed in these operation theaters. Operation theater complex of west wing is located on first floor. It has 7 operation theaters for various departments. Orthopedic, neurology and general surgeries are performed here.

FRONT OFFICE

Front office is the first point of contact between the hospital and its customer.

Services provided by front office

- 1) Inpatient and outpatient registration.
- 2) IP admission and discharge
- 3) Medical alert details
- 4) Appointment scheduling
- 5) Doctors schedule summary
- 6) Patient billing (IPD,OPD)
- 7) Insurance management
- 8) Patient visit history

CALL CENTRE

Call centre of Max hospital, Saket operates at 24*7. It is centralized patient contact centre for Saket. It can be used as an information centre for all customers.

Call centre deals with:

- Doctor's appointment
- Health check ups
- Radiology and diagnostic appointments
- Patient's information
- Doctor's information
- Employee's information
- Specialty information
- Other department information
- It handles internal emergency e.g. Blue code

Main board line number is: 26515050

BLOOD BANK

Max super specialty hospital has its own blood bank. All blood groups are available. But it is preferred that patient arranges blood through his relatives or any friend and should give replacement.

Blood bank consists of :-

1. Sample collection area / reception area: In reception area a form is given to the attendant of the patient regarding their details before he/ she donates the blood.
2. Aphaeresis area: blood has several components including red blood cells, platelets and Plasma. Donor aphaeresis is a special type of blood donation in which a specific component platelet, plasma is withdrawn from donor
3. Component room: In component room the whole blood is separated into packed cells, FFP and platelets.

4. TTI room: it is to diagnose transfusion transmitted infections. If donor is detected positive for TTI status it means donor have the potential to transmit the infection to their partner and children.
5. Issue room: This room is to issue the screened blood bags.

Staff of blood bank consists of 1 HOD, 2 blood bank officer, 1 technician supervisor, 16 technicians, 2 staff nurse, 2 computer executives, 4 GDA.

IPS(INTERNATIONAL PATIENT SERVICES) DEPARTMENT

It takes a lot to be a world-class health care services provider and as per patient registration data, over 11 lakh overseas patients have been helped to get back to their normal lifestyle. This department, situated in East wing, is exclusively dedicated for the services of international patients.

Contact Procedure:

- Patient sends a query and/or reports
- IPS Team consults the relevant consultant and provides diagnosis, proposed treatment and estimate
- If required, a telephonic meeting may also be arranged
- Patient confirms if he wants to have treatment at Max Healthcare to provide Visa Facilitation Letter
- Patient confirms the arrival date and time
- IPS Team, in the meantime, books room, OT etc. for the patient
- Patient is received at the Airport and then, brought to the Hospital/Guest House/Hotel

Also, another contact procedure is as follows:

- Max hospital conducts free outreach OPDs in other countries, at least 1-2 per year
- Max hospital also has tie ups with different hospitals in these countries

PHARMACY DEPARTMENT

Max pharmacy is self-owned with Central Pharmacy situated at corporate office, Okhla. There are 2 In-patient pharmacy stores and 2 Out-patient stores in the hospital.

PURCHASE

Auto purchase requisition is given to central purchasing team which is forwarded to vendor (outsourced). For purchasing the items ABC method is followed. Weekly requisition is done and vendors take minimum 3 days for delivery of drugs to hospital.

STORING OF DRUGS

Medicines are arranged according to VISTA (e-care) in Client patient record system via generic name in alphabetic order in racks, shelves, cupboards and drawers. Oral, parenteral and topical items are stored separately. Near expiry (expiry within 3 months) is stored in separate designated area to expedite the consumptions.

CATH LAB

Catheterization laboratory or cath lab is an examination room with diagnostic imaging equipment used to visualize the arteries of the heart and the chambers of the heart and treat any stenosis or abnormality found.

Diagnostic procedures performed here are:

- Angiography
- Electrophysiology study
- Cath study

Out of these 3 angiography and cath study is done in cath lab 1 and EPS is done in cath lab 2.

SECURITY DEPARTMENT

The security department is an eye and ear of every organization acting as a liaison between management and staff. The control room of Security Department is located on B1 (basement) of East Wing, Max Saket.

ABOUT THE RADIOLOGY DEPARTMENT:-

Situated in the ground floor of the west wing of the hospital.

Procedures done in the department:-

(1) Routine X-Ray studies

- (a) Plain - e.g. chest, spine, etc
- (b) Routine fluoroscopic procedures e.g. Barium studies

(2) Routine ultrasound studies

- (a) Ultrasonography - e.g. Abdomen, Pelvis
- (b) Doppler studies peripheral (B/W & colour) e.g. 2 D echo, vascular studies, etc

3) Mammography

4) Dexascan

5) Special imaging techniques

- (a) CT Scan (Computerized Axial Tomography)
- (b) MRI (Magnetic Resonance Imaging)

Divided into two parts:-

1) For ultrasonography, mammography, dexascan

2) For CT Scan, MRI, X ray, fluoroscopy

Consist of:-

- 1) Reception:- Counter for appointment and billing
- 2) Waiting room with general facilities like toilets, drinking water, air conditioning
- 3) Diagnostic room
- 4) Counseling room
- 5) Changing room
- 6) Film processing room
- 7) Radiologist office
- 8) Report collection room

PROCESS FLOW



Figure:-Process flow in radiology department for outpatients.

Firstly, the patient comes to the radiology front desk after been prescribed by doctor for the scan; patient is either taken prior appointment or walk in patient. The availability of the slot required is then checked for the walk in patient by the front desk. Once the slot is checked, the requirements for the scan i.e. condition of the patient required to undergo the scan is checked.(E.g. proper creatinine level for renal patients).After that the patient is been provided the appointment and been told to wait for his turn. Finally the procedure is been performed

ABOUT THE SERVICE QUALITY DEPARTMENT:-

This department deals with the quality of the services provided by the hospital.

Feedback forms that are kept in the feedback box in every department are collected daily and then divide it into positive and negative forms. Suggestions are also considered as negative feedback

After going through all the complaints lodged by the patient or their attendants, service quality departments informed the respective department head within 24 hrs about these responses from their department and tell them to rectify or improve the quality of their services.

Department head who look after these services then try to know the root cause of the problem and within 72 hrs solve and close the case by providing proper training or counseling

Various ways to collect the feedback:-

- 1) Through feedback forms
- 2) Through blogs
- 3) Directly to the quality manager

Everyday quality manager takes a round to every ward to know their problems or feedback about the services provides to them.

This will help to know the various issues related to the quality of the services provided by the hospital and to help them to understand the various areas which need to be improved.

Issues can be related to:-

- 1) Behavior of the staff,nurses,doctors
- 2) Cleanliness
- 3) Quality of food
- 4) Getting medications on time or not
- 5) Delay in any of the services etc.

Therefore, this department plays a very important role to understand the need of the patient or their attendant and to improve the quality of the services provided by the hospital.

CENTRAL STERILIZATION SERVICE DEPARTMENT

INTRODUCTION-

CSSD is the heart of the hospital infection control and the most important unit of the clinical support services. CSSD role lies in receiving, cleaning, packing, disinfecting, sterilizing, storing and disinfecting instruments as per well-delineated protocols and standardized procedures.

CSSD department in max healthcare, saket is a centralized department and the location of the department is in the basement

The main aim of the CSSD department is to reduce the level of micro-organisms from 10^6 to 10^{-6} .

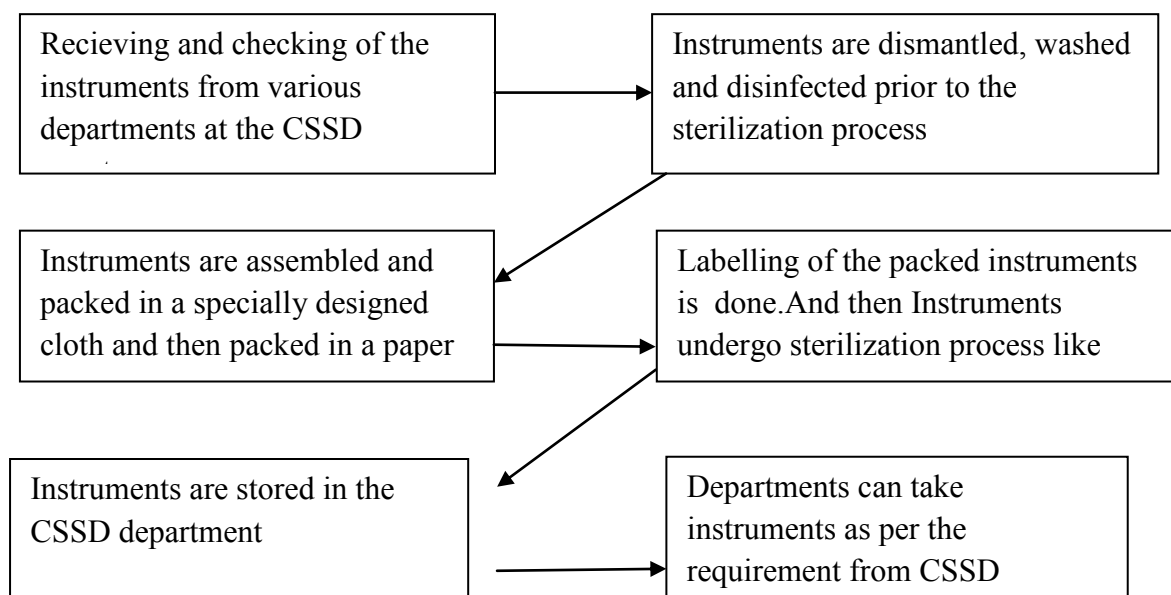
ZONES PRESENT-

- Decontamination
- Clean
- Sterile

Color coding for the following zones -

- Decontamination area-red color
- Clean area-blue color
- Sterile area-green color

PROCESS FLOW-



- At the time of receiving the instrument at the CSSD department, the instruments are counted, checked for any damage, segregated according to the method of sterilization required for the instrument.
- Instruments used for the washing of the instruments are fully automated and according to the European standards.

- For packing of the instruments medical grade paper and cloths are used which are specifically designed for the purpose(they have a zig -zag pattern)
- Once sterilized and packed instrument can be used within 6 months.

EQUIPMENT LIST-

- Washer-
- Autoclave -
- Plasma sterilizer-
- ETO sterilizers-
- Dryers-
- Air-guns-
- Water-guns-
- Ultrasonic cleaners-

QUALITY INDICATORS-

Various quality indicators used in CSSD are-

- **Batch monitoring strip-** a yellow colored strip which is attached to every lot which on exposure to right temperature and pressure turns black

FOOD AND BEVERAGES

Introduction

Food and beverages department deals with supply of food to the patients sometimes to the patients attendant and during the various conferences and meeting in the organization.

Although food and beverages dept at the max healthcare centre is outsourced to the sodexo food services but controlling power is with **max employee**.

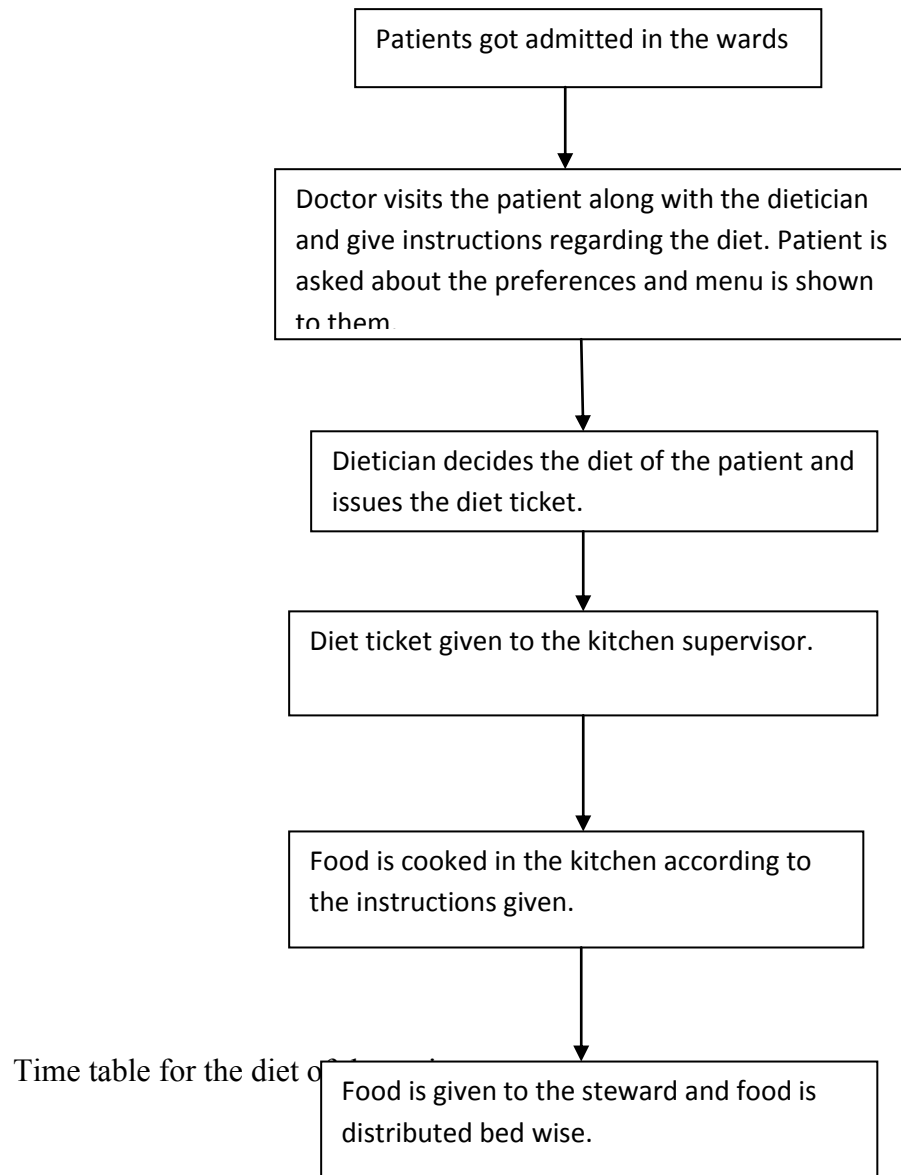
- The department consist of one head chef from Max , 26 chefs are from sodexo,72 stewards from sodexo.
- Dietician -25 of Max.
- Max chef keeps check on quality of food provided to the patients.
- The task of the sodexo is to provide food to ipd patients , max staff and visitors.
- Other then sodexo there are various food outlets which are as follows
 - Sagar ratna
 - Café coffee day

- Subway
- Quality express

Royalties are being charged from these outlets.

Process flow

Supply of food to the patients



Time table for the diet of patients

7-8AM	Breakfast
10:30-11:30AM	Soup/Beverages
1-2PM	Lunch
4-5PM	Evening tea
6-7PM	Soup
8-9PM	Dinner

- Dinner of the same day, breakfast and lunch of the next day are decided prior in the evening and diet tickets are issued by the dietician and given to the chef.
- Apart from these if patients wants to have something extra, those can be provided to the patient after consulting dietician, but for an extra charges.

Different menu offered are –

- Indian menu
- Afgani menu for middle east patients.
- Continental menu
- No onion and no garlic menu for jain patients

DEPARTMENT OF LAB SERVICES

INTRODUCTION-

An ISO 9001:200 certified lab, it is open 24 hrs a day. It's a high-tech lab with fully automated instrument which are directly interfaced with ***hospital information system*** and ***laboratory information system***. Facility of stat tests (emergency) and sample collection from home is also available.

LABORATORY COMPRISES OF THE FOLLOWING DEPARTMENTS-

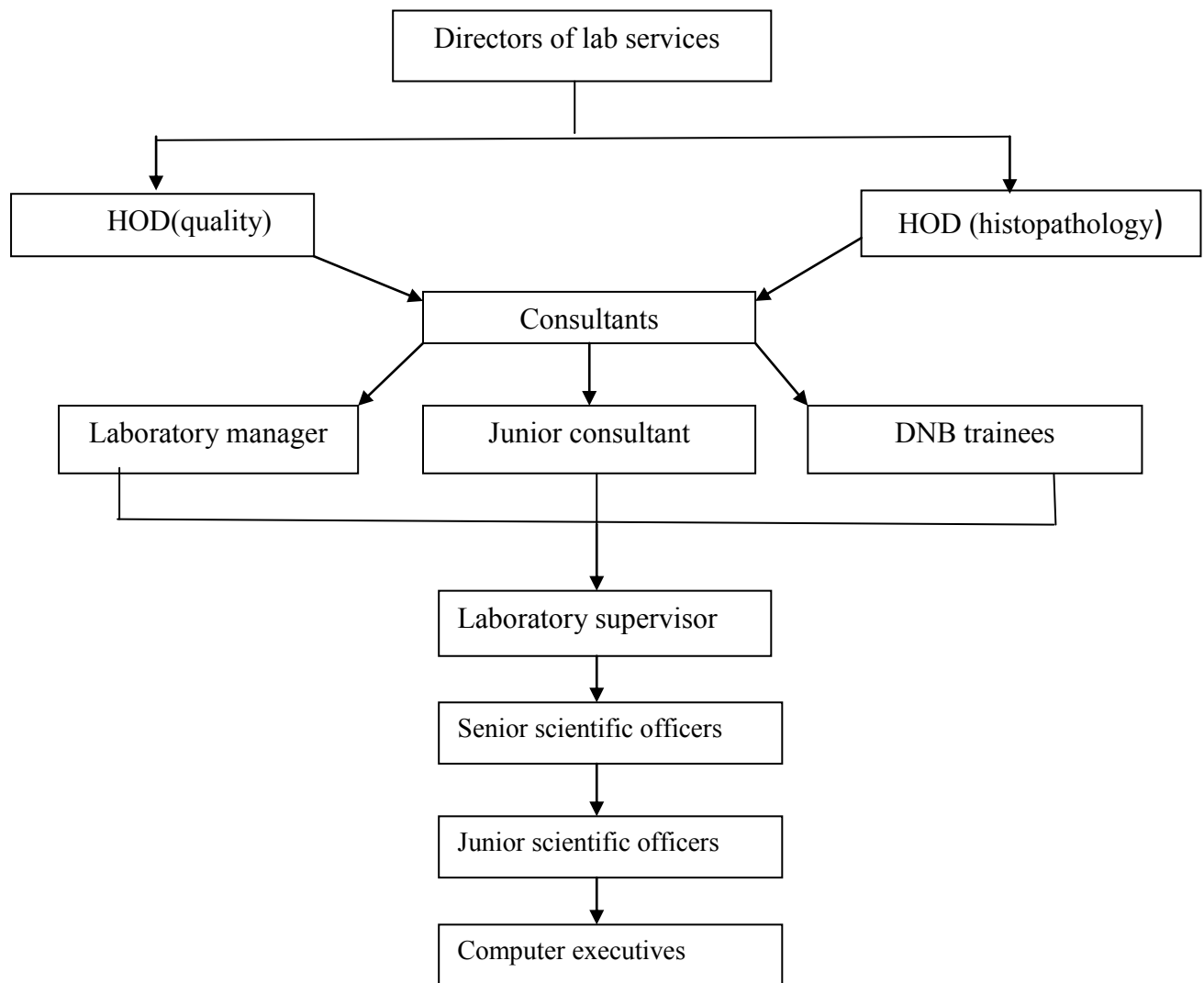
- Biochemistry
- Hematology
- Immunoassay
- Histopathology
- Clinical pathology
- Serology
- Microbiology

LABORATORY INFORMATION SYSTEM- It is connected with hospital information system

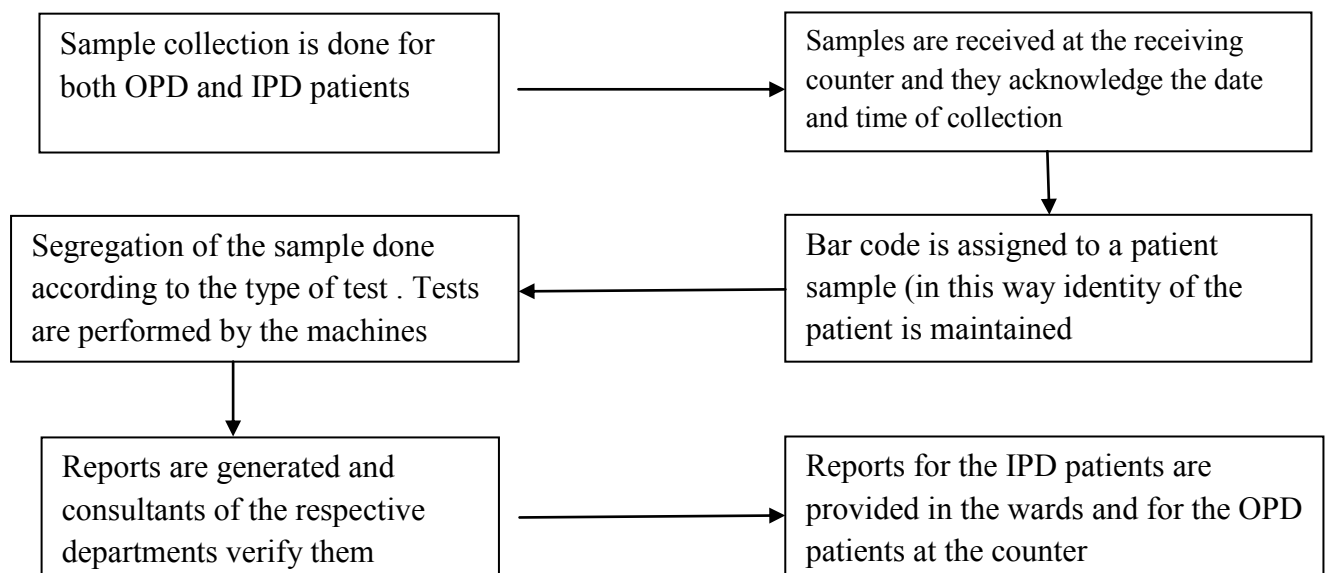
- Sample received-red color
- Samples acknowledged-yellow color
- Test done-blue color
- Result verified-green color
- Billing done-pink color

HIERARCHY- The Department of Lab Is Broadly Divided In Two Departments

- Lab medicine
- Histopathology



PROCESS FLOW-



SECURITY DEPARTMENT

The security department is an eye and ear of every organization acting as a liaison between management and staff. The control room of Security Department is located on B1 (basement) of East Wing, Max Saket.

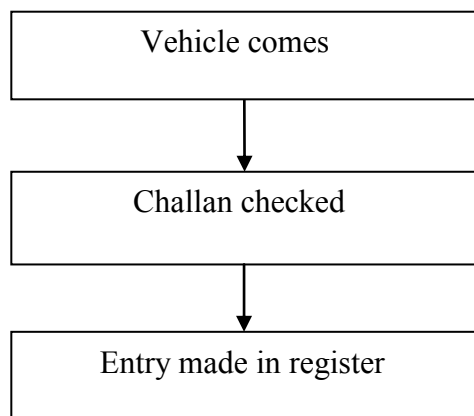
Functions of Security Department:-The security department performs four main functions as discussed below.

1. Security management:-

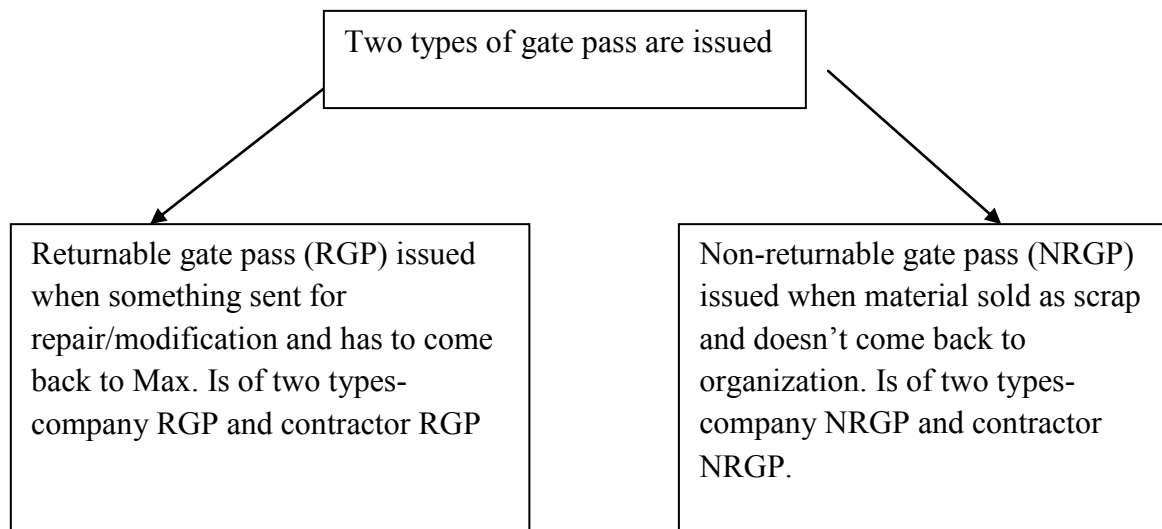
- Selection of people(guards and supervisors)
- Deploying of security staff to different floors and departments
- Checking of people entering hospital
- Turnout and grooming of security staff
- Training of security staff
- MLC handling
- Dispute handling

2. Material management:-It includes management of both incoming and outgoing materials.

a. Flow for incoming materials:-The incoming materials are received either from a company or a contractor to Max.The process flow is as under:-



b. Flow for outgoing materials



3. Disaster management:-

There are six emergency codes:-

1. Red- Fire
2. Black- Bomb threat
3. Blue-Cardiac arrest
4. Yellow- External disaster like earthquake
5. Violet-Violent patient
6. Pink- Missing patient

The SOP's and disaster management plans are prepared by the Security Department. Fire management system includes smoke detectors, sprinklers fitted on ceiling and fire shafts in all corridors.

Walkie talkies are an important source of communication.

Other disasters include floods, water logging, terrorist attacks.

4. Valet management:-

- Helps to optimally utilize the parking space.
- Within a time frame of maximum 7 minutes, vehicle is handed over to customer when asked for in porch.

MEDICAL QUALITY DEPARTMENT

The different **indicators of medical quality** are:-

1. Falls
2. Nosocomial infections
3. Phlebitis
4. Medication errors
5. Near miss(incident might have occurred)
6. Needle stick injury
7. Pressure sores
8. Hypoglycemia
9. Adverse drug reactions
10. Blood transfusion related errors
11. Infection outbreak
12. Notifiable diseases
13. Sentinel events-wrong patient, wrong surgery, wrong side, foreign body left inside cavity.
14. Code blue-Rapid Response Team(RRT)
15. Mortality- data categorized by area, speciality,age
16. Other adverse events
17. Readmission within 14 days of discharge/Return to Emergency within 7 days
18. Return to OT within 7 days
19. Return to ICU within 7 days.

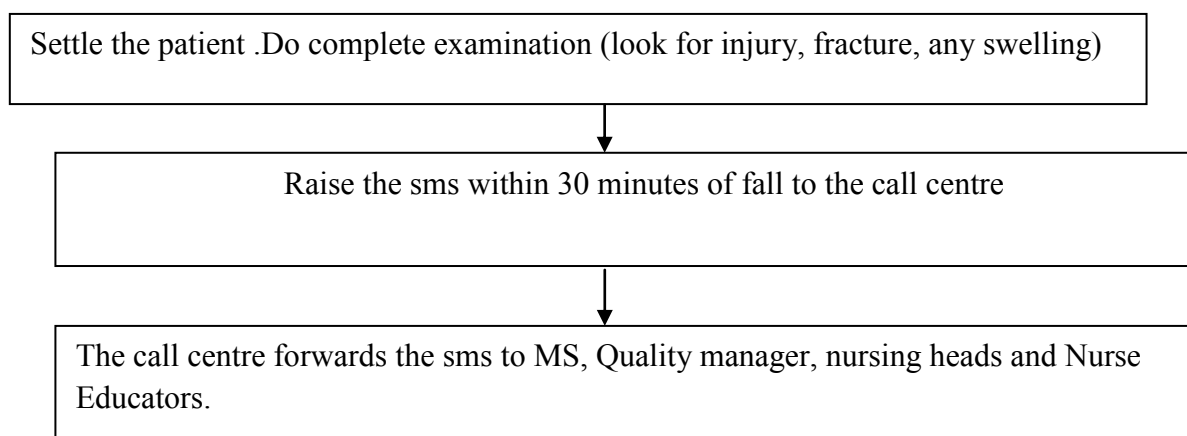
NURSING QUALITY DEPARTMENT

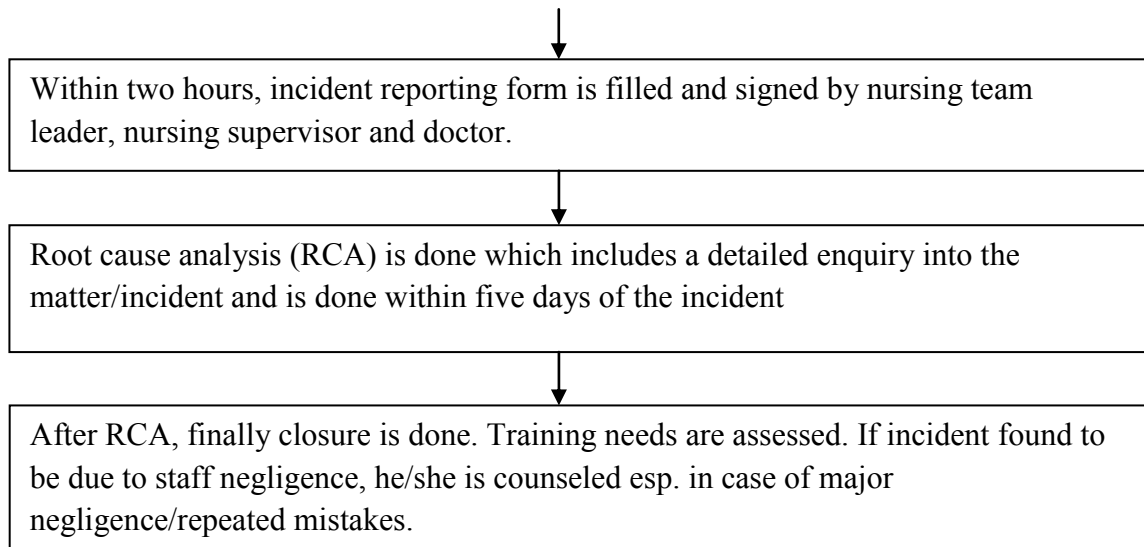
Purpose- To know where nursing quality is lacking.

There are a total of **seven indicators** of nursing quality:-

1. Patient falls
2. Medication errors:-is of four types:-
 - Prescription error-mistake of doctors
 - Dispensing error-mistake of pharmacist
 - Administration error-mistake of nurses
 - Documentation error-mistake of nurses where they fail to document after administration of medicines.
3. Pressure sores: - outside/inside pressure sores
Outside pressure sores means those acquired before admission while inside pressure sores means those acquired post admission. There are special wound care nurses who look after pressure sore dressings and work jointly with plastic surgeon's team.
4. Hypoglycemia-Random blood sugar level falling below 60mg/dl has to be informed. It is called negligence if nurse doesn't inform doctor or fails to recheck the blood sugar.
5. Needle stick injury
6. Health care associated infection is of four types:-
 - CAUTI-Catheter Associated Urinary Tract Infection
 - CLABSI-Central Line Associated Blood Stream Infection
 - VAP-Ventilator Associated Pneumonia
 - SSI-Surgical Site Infection
7. Phlebitis-It is defined as inflammation of vein which has different signs and symptoms like redness, swelling, pain and inflammation. A phlebitis checklist is maintained.

Flow of reporting an adverse event (e.g. falls)





Biomedical engineering

- The department of biomedical engineering deals with the purchase, installation & commissioning, training on operating, handling and maintenance of all the medical equipments in all the areas and departments of the hospital.
- Also deals with the in-house calibration of equipments.
- Gas manifolds are also handled by the biomedical department.

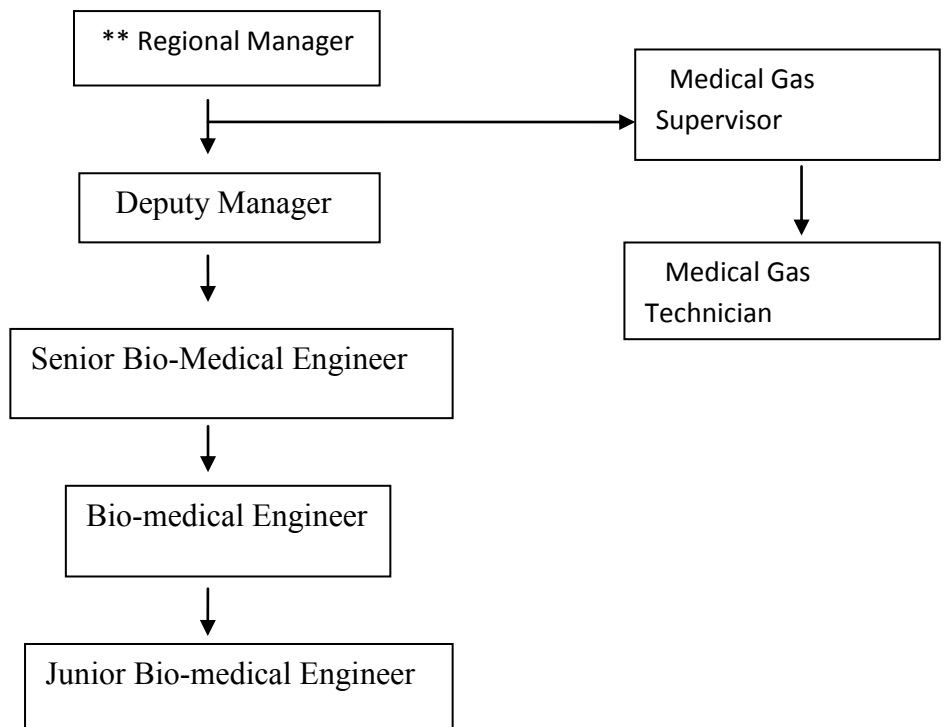
The areas included are:

- All wards
- All operation theatres
- All ICUs
- Patient rooms
- Radiology
- Triage
- Blood Bank
- Nuclear medicine
- Cardiac non invasive diagnostics
- Medical Gases
- Medical Furniture
- LINAC

Objectives:

- To maintain assets list
- To conduct preventive maintenance for biomedical equipments.
- To ensure timely repair of biomedical equipments medical furniture.
- To conduct calibration/validation of biomedical equipments.
- Preventive maintenance for Medical Gas equipments.

Organizational chart



Human Resource Management

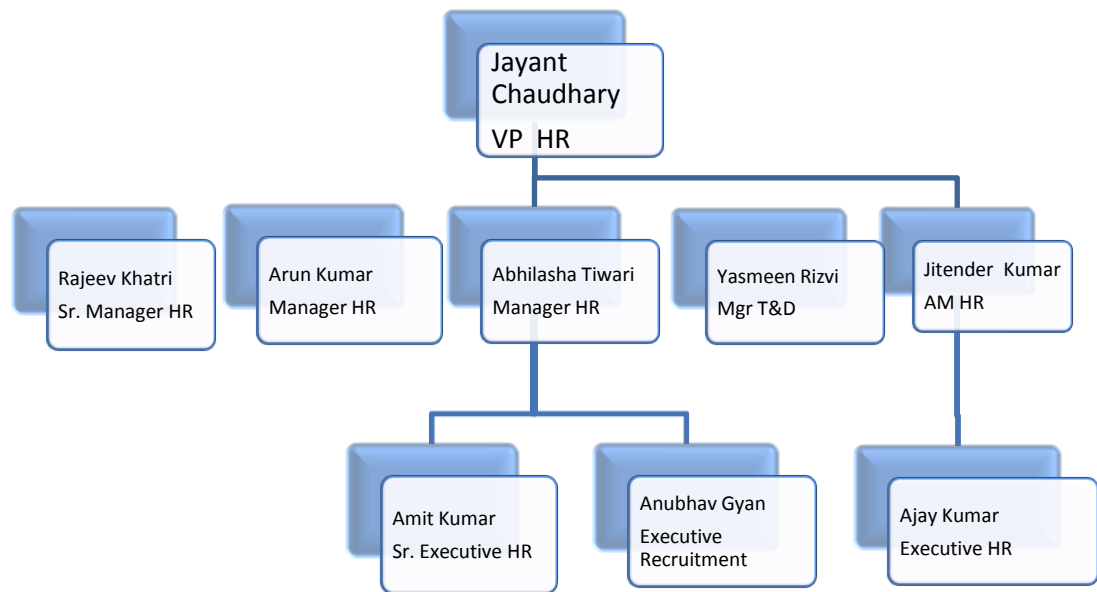
Human resource management (HRM or simply **HR**) is a function in designed to maximize employee performance in service of their employer's strategic objectives. HR is primarily concerned with how people are managed within organizations, focusing on policies and systems.

Following are the policies undertaken by the Human Resource Management Department:-

- Human Resource Planning Policy.
- Job Profile Format.

- Recruitment policy.
- Training and development policy.
- Induction and Orientation policy.
- Performance appraisal Policy.
- Complaint & Grievances Redressal Policy.
- Disciplinary Policy.
- Medical Discount Policy.
- Annual Medical Check-up Policy.
- Clinical credentialing and privileging Policy.
- Nursing Credentialing and Privileging Policy.

HR STRUCTURE



ONCOLOGY DEPARTMENT

Oncology is a branch of medicine that deals with cancer.

Oncology in MAX is concerned with:

- The diagnosis of any cancer in a person (pathology)
- Therapy (e.g. surgery, chemotherapy, radiotherapy and other modalities)
- Follow-up of cancer patients after successful treatment.
- Palliative care of patients with terminal malignancies.
- Ethical questions surrounding cancer care.

The Oncology Day Ward/Day Care (ODW) as the word implies, provides care for people who need to receive treatment as day cases and do not require staying in hospital as inpatients. Its main function is to assess and treat the patients who are receiving chemotherapy. In the Oncology Day Care 9 beds, 8 recliners and 4 dummy beds are available. Before chemotherapy is commenced, the patient is assessed to make sure that he/she understands and consents to the planned treatment. Blood tests are performed to ensure that their levels are at the required limits.

The patient's weight and height needs to be measured as most chemotherapy doses are calculated according to one's body surface area.

PROJECT 1

STUDY ON UTILIZATION OF RADIOLOGY SERVICES

STARTED ON 1st may 2014 to 31st may 2014

ABSTRACT

The aim of the study was to find out the utilization of CT and MRI machines and suggest ways to increase the efficiency of these equipments by better utilization.

For this purpose four months data is collected and analyzed in one of the MAX Hospitals in Delhi.

Utilization essentially means the use of the equipment to its full potential:-

Utilization index or use coefficient is one of the important parameters to monitor the functional status of the equipment. It is the parameter to assess the productivity of a service or equipment.

The formula used applied to measure the utilization rate is as follows:

$$\text{Utilization Rate} = \frac{\text{Total number of scans in a month}}{\text{Total number of scans that can be done in a month}} * 100$$

If the utilization rate is less than 50 percent the asset is considered to be underutilized and hence a bad investment. However life saving equipments cannot be subjected to this kind of assessment. And it also depends upon the time for which the machine is functional as initial time is required to attain the break even.

INTRODUCTION

The imaging department within a hospital can be treated as a separate business as it is a big profit centre. Provides routine and specialized diagnostic services with imaging technique for indoor, out-patients and walk-in patients . This acts as a big source of revenue generation for a hospital with high profitability.

In the present healthcare scenario, increasing operational efficiency and reducing costs whilst improving services provided to the patient are a constant challenge. Advances in engineering and information technology, particularly during the last few decades have revolutionized medical care. The availability and utilization of various healthcare equipment, at all levels, in the health system for effective and efficient service delivery was amply emphasized in the Alma-Ata declaration

at the International Conference on Primary Healthcare in 1978, Which was later included in the strategy paper of Health for All by 2000 AD. The sophistication in the medical field has led to the development of specialized care centers in an attempt to provide high quality care.

Medical equipment plays a very significant role in healthcare delivery system and revenue generation

The equipment has become more complex and requires regular specialized maintenance and repair, which is very expensive, Hospital equipments falls into an extremely wide spectrum ranging from a simple patient trolley to a high- tech CT and MRI scanner. The term “equipment” in context to the hospital, generally means any instrument, apparatus, tool, appliance, machine or any other related article used for various preventive, diagnostic, therapeutic, supportive, and control procedures for the day to day patient care activities.

Hospital equipment can be broadly classified into:

- Biomedical equipment
- Laboratory equipment
- Ward equipment
- Support service equipment

All these account for a major part of any hospital project cost, which could go up to almost 60 percent. Of this the biomedical equipment could account for nearly 50 percent of the costs. Keeping this in view, it is essential to ensure maximum utilization of the equipment with minimum downtime. With the adaption of proper maintenance techniques and management systems one can utilize resources optimally and reduce the breakdown and related maintenance

RATIONALE/NEED OF THE STUDY

To understand the level of utilization of the radiology services and its equipments and suggest ways to increase its efficiency.

RESEARCH QUESTION

What are the level of utilization of radiology services and its equipment and various ways to increase its efficiency?

OBJECTIVE OF THE STUDY:-

An optimum utilization of the equipment will result in:

- Optimal patient handling and rapid turnover
- Minimum possible costs
- Increase in the revenue of the hospital
- Increase utilization of the resources

ABOUT THE RADIOLOGY DEPARTMENT:-

Situated in the ground floor of the west wing of the hospital.

Procedures done in the department:-

(1) Routine X-Ray studies

(a) Plain - e.g. chest, spine, etc

(b) Routine fluoroscopic procedures e.g. Barium studies

(2) Routine ultrasound studies

(a) Ultrasonography - e.g. Abdomen, Pelvis

(b) Doppler studies peripheral (B/W & colour) e.g. 2 D echo, vascular studies, etc

3) Mammography

4) Dexascan

5) Special imaging techniques

(a) CT Scan (Computerized Axial Tomography)

(b) MRI (Magnetic Resonance Imaging)

Divided into two parts:-

1) For ultrasonography, mammography, dexascan

2) For CT Scan, MRI, X ray, fluoroscopy

Consist of:-

1) Reception:- Counter for appointment and billing

2) Waiting room with general facilities like toilets, drinking water, air conditioning

3) Diagnostic room

4) Counseling room

5) Changing room

- 6) Film processing room
- 7) Radiologist office
- 8) Report collection room

There are two MRI and one CT scan machine in the department.

Timings for OPD patients:-8am to 8pm

In between this IPD and Emergency patients are also taken.

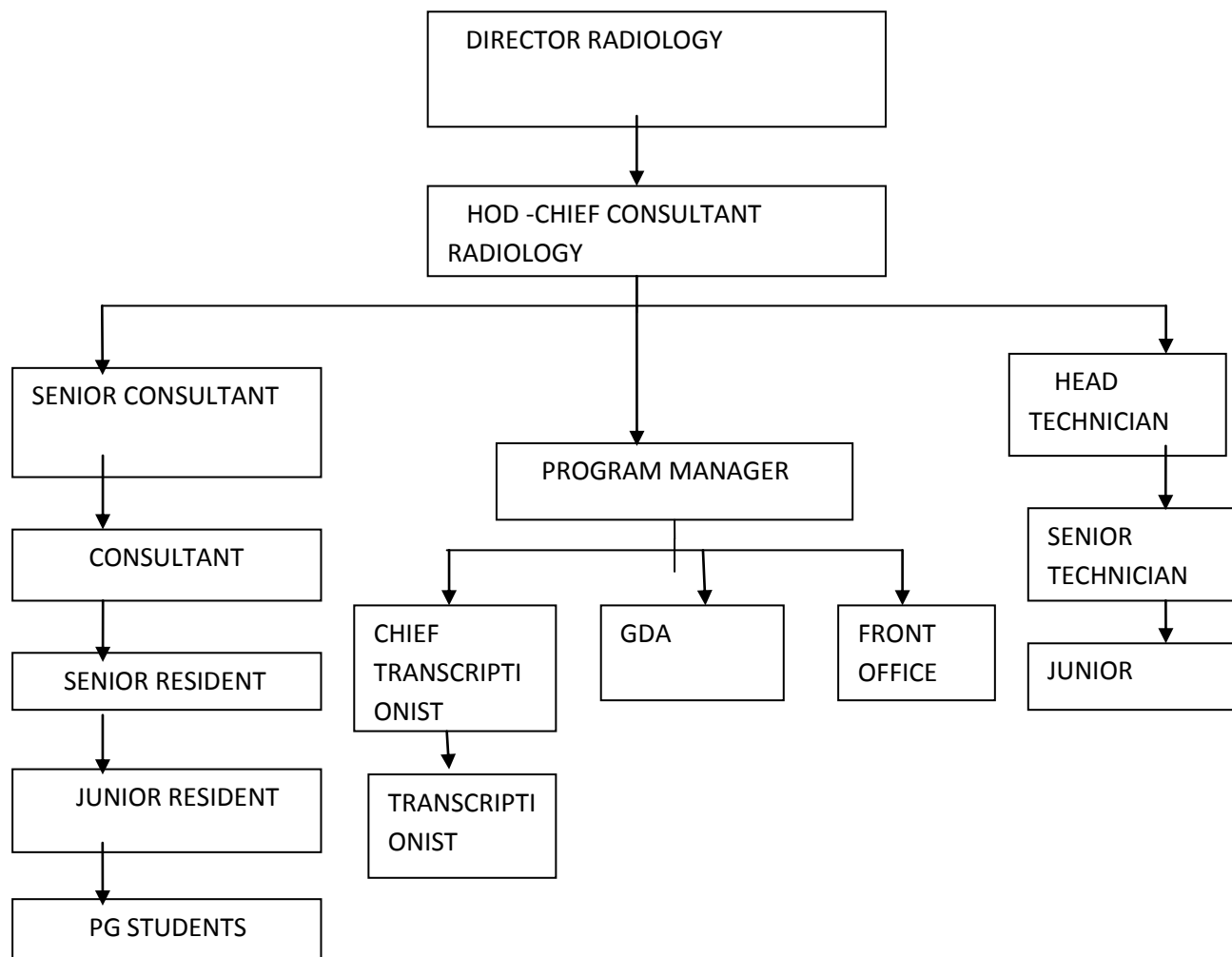
Main OPD hours: - 8am to 6pm and after 8pm only IPD and Emergency patients are taken

Report collection: - If the scan is done before 12pm, reports are ready by the evening and can be collected in the same evening. And if done after 12pm, report will be delivered next day.

Patient who comes in the radiology department either walks in or takes the appointment.

Appointment patients are given preference whereas walk in patients have to wait.
Emergency, doctor's referred patients or ICU patients scan is done as soon as possible.

ORGANOGRAM OF RADIOLOGY DEPARTMENT



Process flow in radiology department (OPD)



Figure:-Process flow in radiology department for outpatients.

Firstly, the patient comes to the radiology front desk after been prescribed by doctor for the scan; patient is either taken prior appointment or walk in patient. The availability of the slot required is then checked for the walk in patient by the front desk. Once the slot is checked, the requirements for the scan i.e. condition of the patient required to undergo the scan is checked.(E.g. proper creatinine level for renal patients).After that the patient is been provided the appointment and been told to wait for his turn. Finally the procedure is been performed.

PROCESS FLOW OF RADIOLOGY DEPARTMENT (IPD)

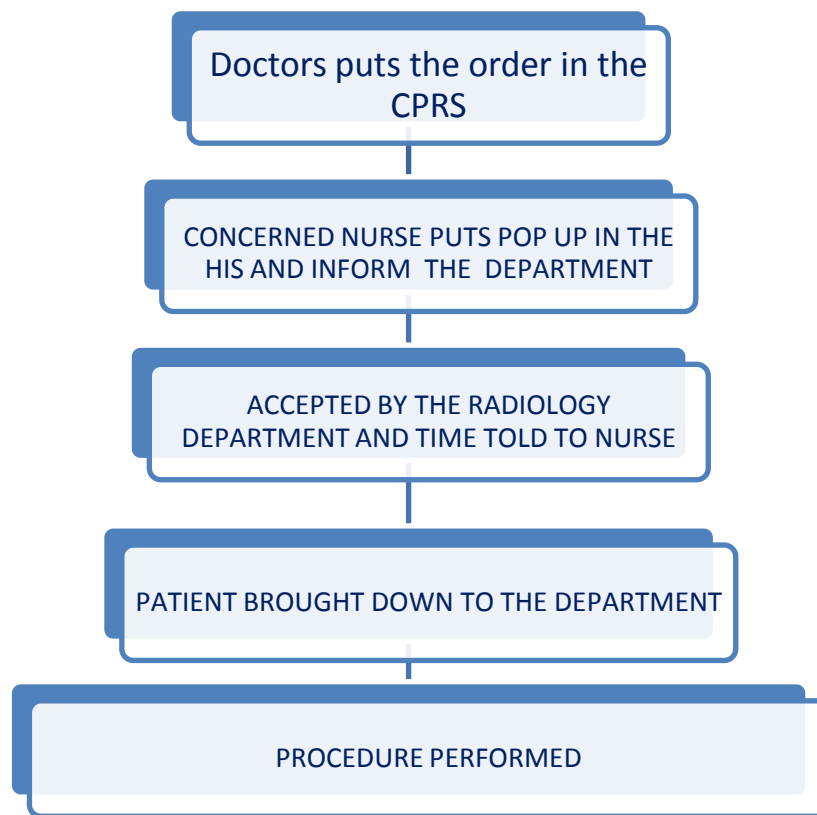


Figure: - Process flow of the radiology department for Inpatients

The above Figure depicts the process flow in followed for inpatients in the department of radiology. At first, doctor puts the order in the CPRS and then the concerned nurse puts the pop up in the HIS and informs the department. Which is further been accepted by the radiology department and a slot is provided, the patient is then brought to the department and the procedure is performed.

Emergency and In patients receives priority in the scans, when compared to the outpatients as the urgency required for the scans are higher.

UTILIZATION OF MRI MACHINE

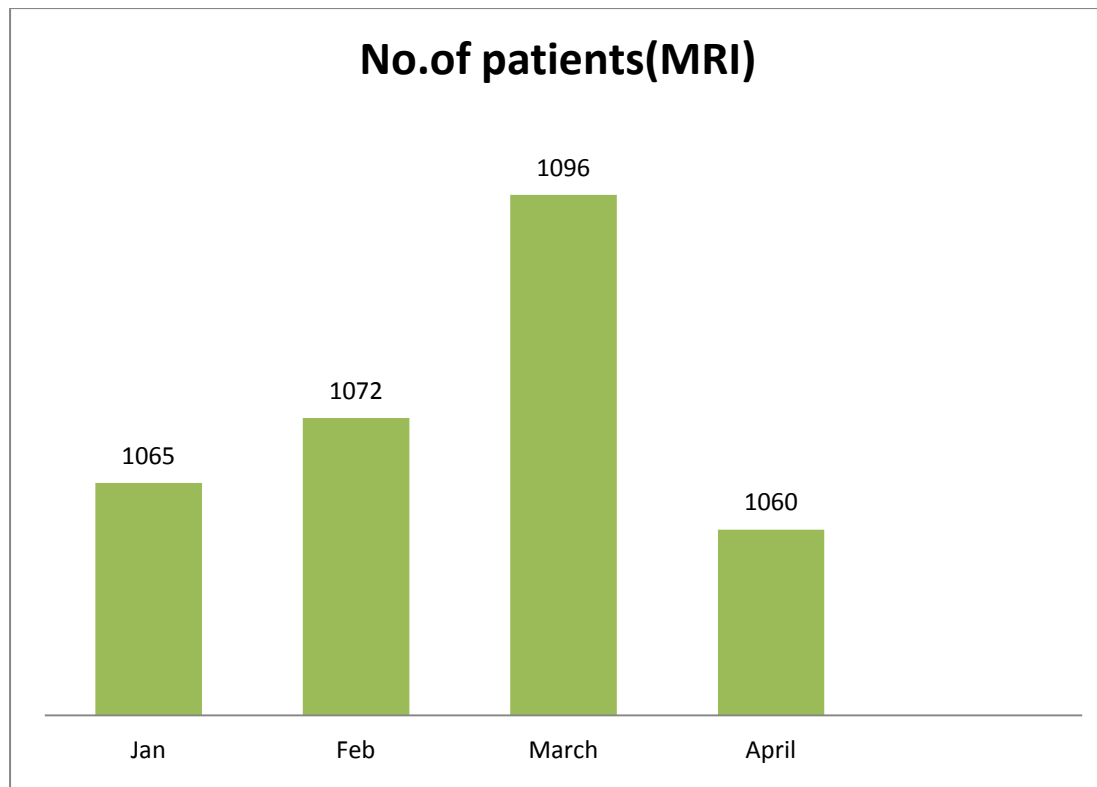


Figure: - Number of patients in MRI

Interpretations of the figure:-

In the above figure, there is a gradual increase of in the number of patients in the MRI scan from January 2014 to February 2014 which further kept on increasing from February 2014 to March 2014 .However a remarkable decrease in the number of patients from march to April 2014.

UTILIZATION OF CT SCAN MACHINE

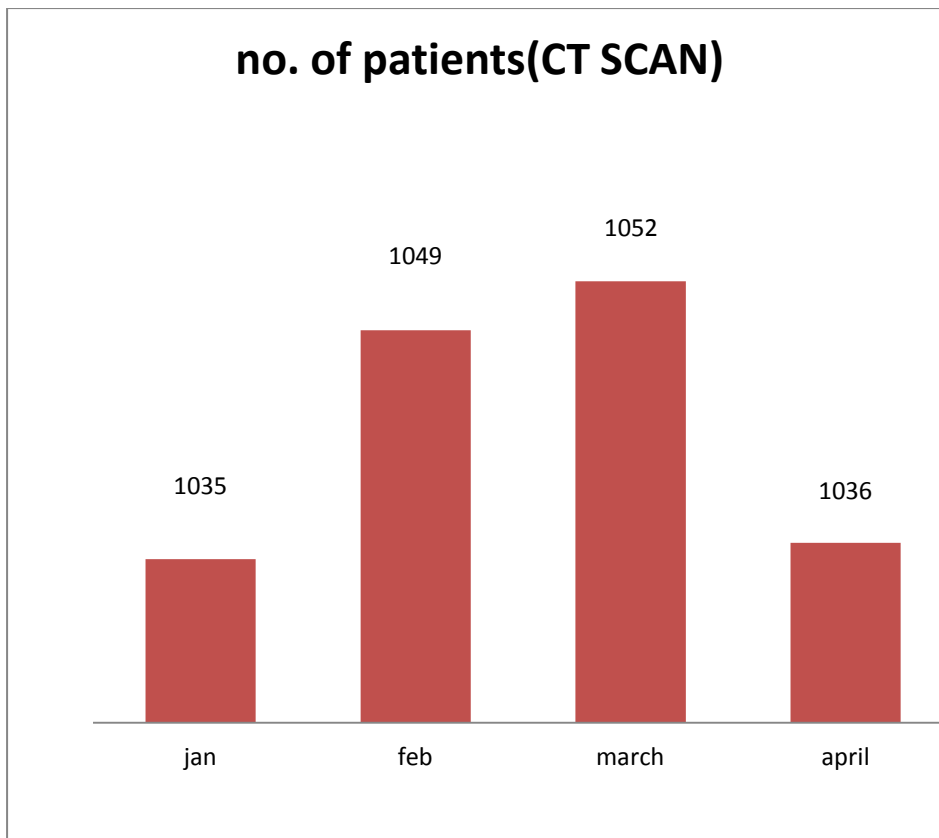


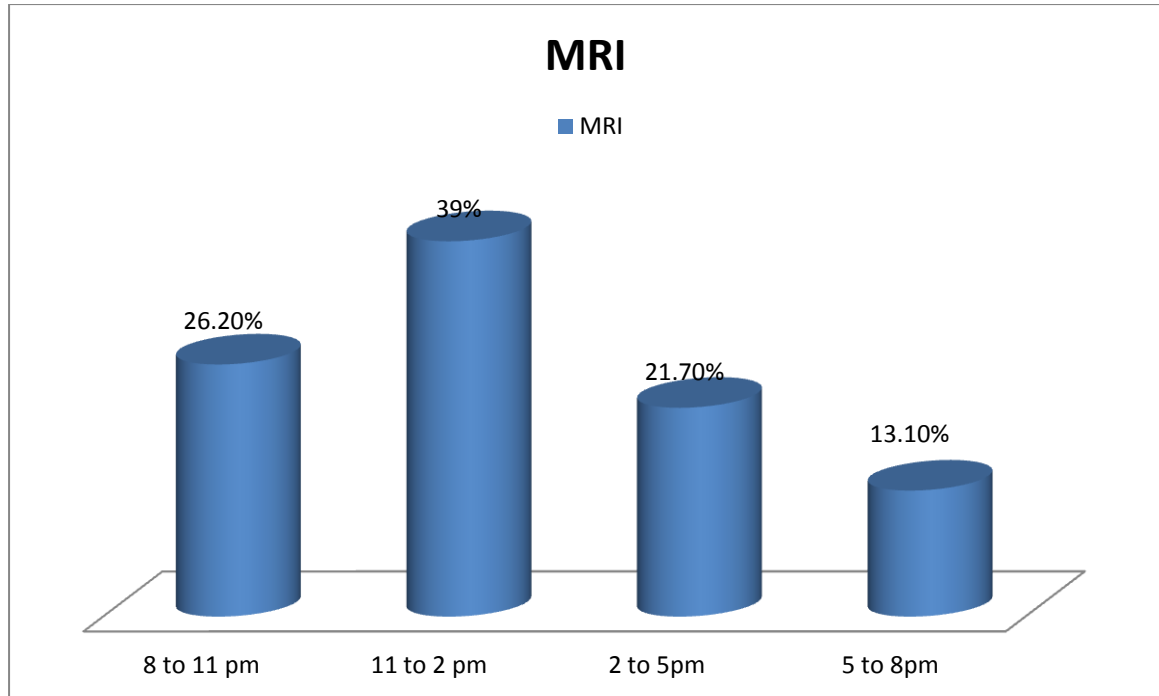
Figure:- Number of patients in CT

Interpretation of the figure:-

The following figure indicates the number of patients for CT scans from the month of Jan 2014 to April 2014. There was an increase in number of patients from the month of January to February, which further increased from the month of February to March 2014.

However, there was remarkable decrease in number of patients from the month of March to April.

LEAD TIME FOR THE UTILIZATION OF MRI MACHINE

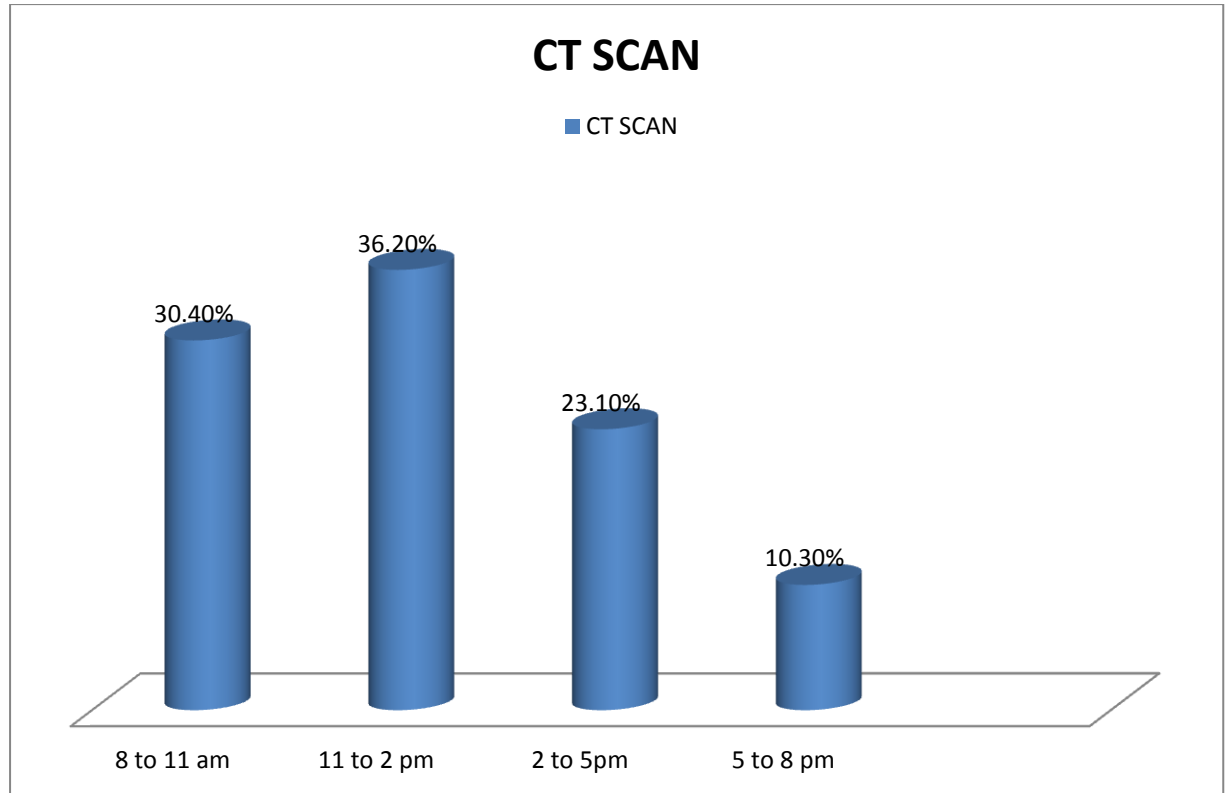


Interpretation of the figure:-

The lead time in the utilization of the MRI in the department indicates the highest utilization between 11 to 2 pm i.e 39%, with the second highest utilization time between 9 to 11 am i.e. 26.2%.

The least utilization is between 3 to 5 pm in the evening with utilization around 14.1%

LEAD TIME FOR UTILIZATION OF CT SCAN MACHINE



Interpretation of the figure:-

The above figure indicates the lead time in the utilization of the CT machine.

The figure clearly indicates highest utilization i.e. 36.2% in the time frame of 11 to 1pm, followed by 30.4% in the time frame of 9 to 11 am. With the utilization of 23.1% time frame of 1 to 3 pm stays in the middle. The least utilization is found between the time frame of 3 to 5 pm with utilization of 11.3%

UTILIZATION OF MANPOWER IN THE DEPARTMENT

Utilization of CT technician: - The utilization of the CT technician can be found by dividing the total productive hours divided by the number of hours the staff is paid.

Technicians work in morning shift 8am to 4:30pm, afternoon shift 11:30 to 8pm

,On an average 28 CT are done in morning shift and each CT takes around 15 minutes .So the utilization can be found by:-

Utilization CT technician: - $\frac{\text{Total productive hours}}{\text{Total paid hours}}$

$$= 7.5/8.5 \times 100$$

$$= 88.23\%$$

Utilization of MRI technicians: - The utilization of MRI technician can be found out by applying the above formula. Here the MRI procedures takes around 30 minutes and on an average there are 12 MRI are done in the morning shift per MRI machine as there are two MRI machines in the department. So utilization of each MRI technician is.

Utilization of MRI technician: - $\frac{\text{Total productive hours}}{\text{Total hours paid}}$

It means utilization of each technician is $6/8.5 \times 100$

$$= 70.58\%$$

UTILIZATION RATE OF CT SCAN MACHINE

On an average 42 scans are done in a day and each scan takes an average of 15 min
Therefore 48 scans can be done in a day, all the days OPD is active except Sundays i.e 26 days

$$\begin{aligned}\text{Utilization Rate} &= \frac{\text{Total number of scans in a month}}{\text{Total number of scans that can be done in a month}} * 100 \\ &= 1092/1248 * 100 \\ &= 87.5\%\end{aligned}$$

UTILIZATION RATE OF MRI MACHINE

On an average 20 scans are done in a day per MRI Machine and each scan takes an average of 30 min
Therefore 24 scans can be done in a day per MRI machine as there are two MRI machine, all the days OPD is active except Sundays i.e. 26 days

$$\begin{aligned}\text{Utilization Rate} &= \frac{\text{Total number of scans in a month}}{\text{Total number of scans that can be done in a month}} * 100 \\ &= 520/624 * 100 \\ &= 83.33\%\end{aligned}$$

UTILIZATION PERCENTAGE OF CT AND MRI

The utilization for the CT and MRI was found for the 15days of May and the following methodology was applied.

Utilization for the CT machine = Number of hours the machine is used in a week

Total working hours

$$=124/154*100$$

$$= 86.1\%$$

Utilization for the MRI machine = Number of hours the machine is used in a week

Total working hours

$$= 115/174*100$$

$$=79.16\%$$

Recommendations:-

Utilization can be increased by:-

- Proper guidance to the patient for the availability of these facilities
- Allocating an addition staff in the department to make the process fast and prompt.
- Separate counter for handling Emergency,ICUs and IPD Patients who comes in between the OPD timings.
- To increase the working hours of CT Scan and MRI machine
- The turnaround time for waiting can be reduced by allocating more counters for procedure billing which will make the process faster thus increases the utilization.
- To fix proper responsibility for timely calling the name of the next patient as soon as the scan is done to enable patient satisfaction.
- Distribute patients equally in the OPD timings to avoid the workload in the particular time of the day.
- As the utilization of these machines are quite good, so we can also open the OPDs on Sundays also by allocating the duties of the staff on the rotating basis in the various days of the week, which in turn will increase the revenue of the hospital.

PROJECT 2:-

STUDY ON ONCOLOGY CHEMOTHERAPY PROCESS FLOW AND IDENTIFY BOTTLENECKS

MAX HEALTHCARE, SAKET, NEW DELHI

Study started on 24th April 2014 to 31st May 2014

INTRODUCTION

- The Oncology Day Ward/Day Care (ODW) as the word implies, provides care for people who need to receive treatment as day cases and do not require staying in hospital as inpatients. Its main function is to assess and treat the patients who are receiving chemotherapy.
- It also provides care for those who are undergoing chemotherapy and need assistance with difficulties related to their treatment and condition.
- The Oncology Day Care is open from Monday to Saturday
- Timings: - 8am to 8 pm
- Patients who are receiving chemotherapy are given priority and normally seen on a first come first served basis or at the doctor's discretion.
- Patients who come without an appointment will be seen according to their priority. However one is advised to call the front office prior to attendance.
- One person should accompany the patient due to the limitation of space available and to sign the consent form.
- Once the treatment has started, staff will be able to give an estimated time of when the patient will be ready for discharge.

GENERAL INFORMATION -CHEMOTHERAPY

- In the Oncology Day Care 9 beds, 8 recliners and 4 dummy beds are available.
- Before chemotherapy is commenced, the patient is assessed to make sure that He/she understands and consents to the planned treatment.
- Blood tests are performed to ensure that their levels are at the required limits.

- The patient's weight and height needs to be measured as most chemotherapy .Doses are calculated according to one's body surface area.
- Most information about chemotherapy is given by the Consultant Oncologist when they are first seen; however, further details and queries can be dealt with by the doctors and nurses at the ODW
- All chemotherapy regimens are different. Some can be taken in tablet form and others are administered through a vein, as an injection (bolus) or by infusion (drip). The Consultant Oncologist decides on the appropriate treatment regime.
- The length of time it takes to administer chemotherapy varies. Some may only take a few minutes while others may take up to a few hours.
- Medications required to take at home will be prescribed at the Oncology Day Ward by the doctor examining the patient and written advice given on how to take them.

RATIONALE/NEED OF THE STUDY

- To understand the day care process and reduce the delay (if any) to make the process Smooth and faster which will increase its efficiency.

RESEARCH QUESTION

- What are the various reasons of delay in the day care process?

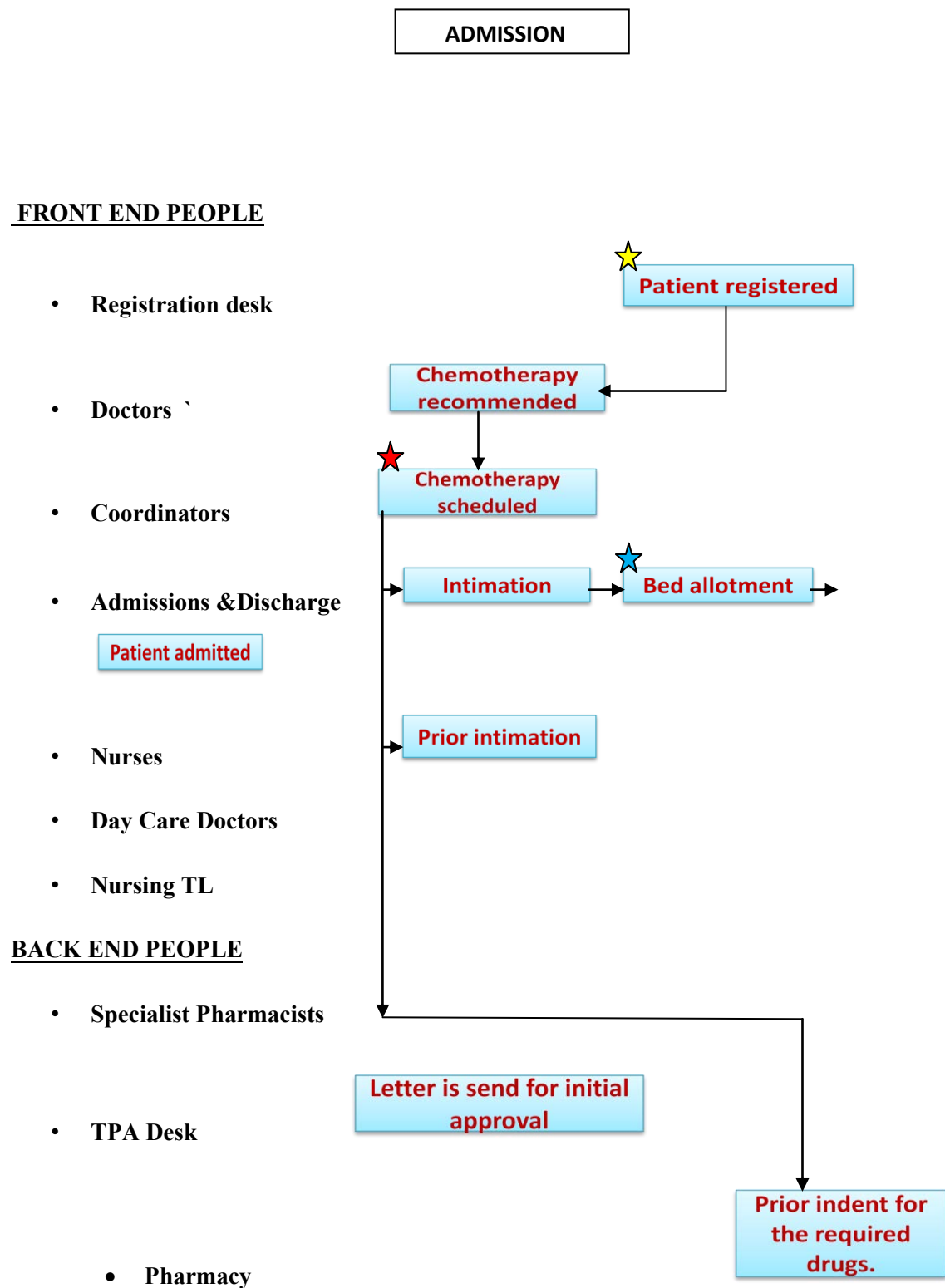
OBJECTIVES OF THE STUDY

- Process Mapping
- Identification of bottlenecks and delays in the process
- Streamlining the process
- Increase utilization of resources in day care

CHEMOTHERAPY PROCESS FLOW

- Chemotherapy process flow has been divided into three sections:
 - a) Admission** -This section includes processes involved in admitting a patient, just after the arrival of the patient at the hospital.
 - b) Process** -This section includes all the internal processes that take place after admission of a patient in Day Care

c) **Discharge** -This section includes processes taking place after chemotherapy is started. It involves step involved in discharging a patient.



Patient Registered:-

Four types of patients come in the day care:-

1. **Cash patients-** Patient pays in cash and gets the discharge.
2. **Corporate patients-** Patient brings the approval letter from the respective company and pays in accordance to the policy.
3. **PSU (CGHS, NDMC, ESI, NR)-** Patient either brings the approval letter from the company or gets discount on the basis of their company card as per the norms.
4. **TPA Patients-** In this case, a prior intimation (a day before admission) is send to the insurance company for the initial approval and after that patient is admitted. After that, discharge summary and bill is sending to the insurance company for the final approval. On receiving the final approval, final bill is prepared and the patient is discharged.

Chemotherapy scheduled

- Patients who are recommended chemotherapy, go to coordinators, where scheduling of chemotherapy is done by them.
- Coordinators explain everything to patients including investigations required and other pre-requisites for chemotherapy, after this date and time is decide for chemotherapy.
- Coordinators prepare a final list of all the patients scheduled for chemotherapy the next day and prior intimation is send to admissions and discharge, nurses, doctors and pharmacy.
 - One of the major areas of concern in scheduling chemotherapy is assigning slots to the patients (there are two slots: Morning (8am to 12 pm) and Evening (after 12pm) wisely, so that patients are not kept waited and the process flows smoothly.

Coordinators book slots considering the following:

- a) Patients having long chemo (6 or 8 hours) are given morning slots.
- b) Patients with short chemo (2 or 3 hours) are given evening slots.
- c) Always, priority is given to a TPA patient, irrespective of a short or a long chemo as approval might take time.
- d) New patients are given morning appointment because they may take more time than old patients due to complete new protocol.

e) Sometimes, it may happen that a long chemo of a patient (suppose 8 hours) is divided and given weekly (every 7 days) or three weekly (every 21 days). This leads to shortening of the chemo process and therefore the patient is given an evening slot.

f) Old patients are given morning slots because waiting time may exceed for evening slots patients due to delay in discharge of the morning shift patients.

Bed allotment

Patient coming first on the day of appointment is allotted the bed first on the basis of age and the process continues for other patients coming after that on that very day. A color coding system is followed for an effective bed management.

Color coding done as:

AVAILABLE Admitted but not occupied

Unavailable Bed retained for attendants

Discharge but not vacated Discharge intimation given

Blocked for other reason

Blocked for admission Vacant but not clean

Bed allotment is one of the steps that takes time and might cause delay in the process ultimately leading to long waiting hours that might lead to patient loss and high level of dissatisfaction among them.

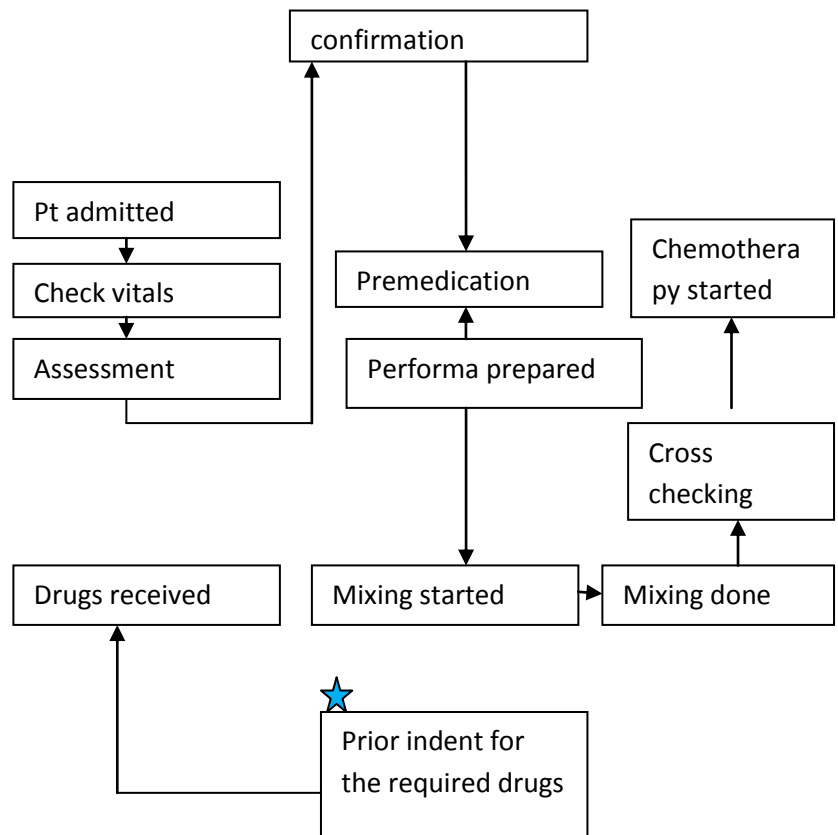
PROCESS

FRONT END PEOPLE

- Registration desk
- Doctors`
- Coordinators
- Admissions & Discharge
- Nurses
- Day Care Doctors
- Nursing TL

BACK END PEOPLE

- Specialist Pharmacists
- TPA Desk
 - Pharmacy



PRIOR INDENT FOR THE REQUIRED DRUGS.

REASONS FOR DELAY:

Case 1 When doctors advise immediate (emergency) chemotherapy, prior intimation cannot be given to the pharmacy. Therefore, it takes time for them to procure drugs, causing delay in the process.

Case 2 when intimation is given but due to unavailability of drugs, procurement of drugs from the dealers takes time. Hence, the delay.

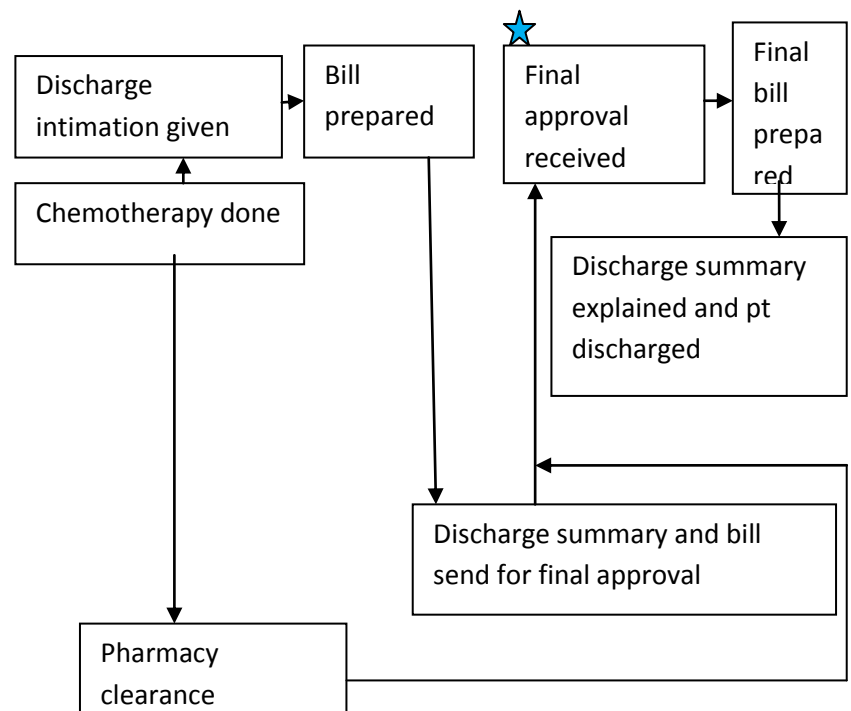
DISCHARGE

FRONT END PEOPLE

- Registration desk
- Doctors`
- Coordinators
- Admissions & Discharge
- Nurses
- Day Care Doctors
- Nursing TL

BACK END PEOPLE

- Specialist Pharmacists
- TPA Desk
 - Pharmacy



If Final approval not received

- In case of TPA patients the final approval is not received, the concerned patient is made to wait till the final approval is received. In these cases, patient occupies the bed unnecessarily which causes other patients to wait, ultimately leading to delay in day care processes. Henceforth, patient loss occurs that leads to a fall in revenue of the hospital.
- In case, the final approval is not received till 8:00 p.m. in the evening. Then the patient is made to pay in cash and discharged. It's a day care policy.
- In cases of patient overload, a TPA patient whose chemotherapy is done pays in cash and go. When the approval comes, the patient is informed and the money is refunded accordingly. This minimizes delay in the process and leads to utilization of day care to its full capacity.
- Sometimes, it may happen that a patient is not ready to pay in cash and is insisting on waiting for the approval even after 8 pm in the evening. In this case, patient is shifted to IPD wards for overnight stay. IPD charges are added to the bill and the process takes even longer. This too leads to unnecessary bed occupancy, ultimately leading to problems in day care process causing mismanagement.

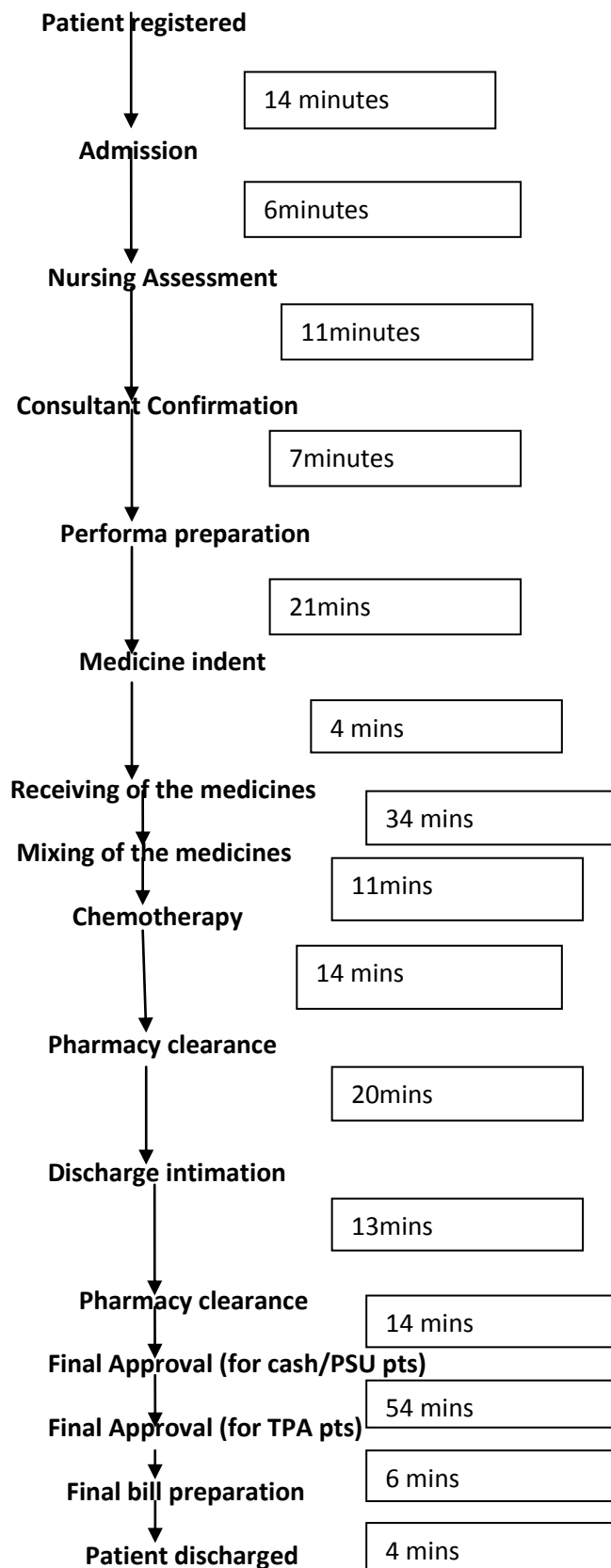
METHODOLOGY:-

25 patients were followed and average time taken between the steps in the day care process was calculated.

Table showing time range (maximum and minimum time) between the steps in the day care process:-

STEPS	AVERAGE TIME	MAXIMUM TIME	MINIMUM TIME
ADMISSION	14 minutes	34minutes	5minutes
NURSING ASSESSMENT	6 minutes	10minutes	2minutes
DOCTORS ASSESSMENT	11minutes	30minutes	2minutes
CONSULTANT CONFIRMATION	7minutes	2hours	1minutes
PERFORMA PREPARATION	21minutes	45minutes	10minutes
MEDICINE INDENT	4minutes	10minutes	1minutes
RECEIVING OF THE MEDICINES	34minutes	1hour	10minutes
CHEMOTHERAPY	16minutes	50minutes	10minutes
PHARMACY CLEARANCE	14minutes	30minutes	2minutes
DISCHARGE INTIMATION	39minutes	2.5hours	5minutes
PHARMACY CLEARANCE AT FRONT DESK	13minutes	20minutes	5minutes
FINAL APPROVAL FOR TPA PATIENTS	54minutes	1.5hours	30minutes
FINAL BILL PREPARATION	6minutes	10minutes	2minutes
PATIENT DISCHARGE	8minutes	15minutes	2minutes

Process flow showing average time taken between the steps is as follows:-



OTHER REASONS FOR DELAY:-

- In case of chemotherapy, some investigations are to be done a day before the admission but PSU patients don't do it a day before to cover these investigation's bill in their hospital bill to avail discounts. So, for these patients investigations are done on the same day of chemotherapy which takes at least 3 hrs to get the reports that causes delay.
- 24 hrs after chemotherapy, an injection is required to be taken which is expensive. So some TPA patients want the cost of injection to be covered in their hospital bill. Due to this patients stay in the hospital occupying the bed unnecessarily this causes delay.
- Sometimes patients (especially in winters morning time) do not report on given time because in winters it gets difficult for them to come early. This leads to delay in starting the first chemotherapy for the day, hence overall delay for the day occurs.
- Sometimes, patient dose is divided into small dosage in 2-3 parts by the doctor because patient becomes weak due to continuous chemotherapy. So next day patient comes without appointment which causes delay as no prior intimation is there.
- In case of new patients it takes time to prepare the Performa because the day care doctors have to understand the complete new regime and then make it as per the dosage required.
- In some patients blood transfusion is required, and if the attendant is not available or not fit enough to donate the blood, it's difficult to get the blood from the blood bank which may take some time and delay in the process.
- Sometimes delay also occurs due to the lack of proper communication between the doctors and the nurses which may cause unnecessary delay in the process
- Sometimes due to IT problems (like in CPRS, HIS) delay occurs.
- Sometimes patient comes without intimation or not enlisted because of lack of proper information between doctors and the coordinators.

MAJOR AREAS OF CONCERN

There are three major areas of concern in the oncology day care process:-

- Pharmacy clearance
- Bed allotment.
- Procurement of drugs from pharmacy.

RECOMMENDATIONS

- Few emergency beds should be kept in the department in order to keep patients from waiting.
- To curb the time taken in pharmacy clearance, someone from pharmacy department should be appointed in the department. This will escalate the process of pharmacy clearance.
- A television should be put in the waiting area, to make it easy for the patient and the respective attendant to pass the long waiting hours.
- More patient care coordinators should be appointed onto admissions and discharge desk of the department. This will help in proper division of work which will eventually lead to increased efficiency and higher rate of work.
- To solve cases involving patients coming without intimation, there should be proper networking in the department. Prior intimation should give in each and every case.

This problem can also be solved by applying CONFIRMATION CALL POLICY. In this a patient needs to give a call to the department before coming so as to confirm his or her chemotherapy a day before. Only after getting the confirmation, patient should come to the hospital. This will help to keep a track of each and every patient coming, which will reduce the problem of patient coming without intimation. Ultimately, the process shortens and number of patients per day increases leading to revenue generation for the hospital.

- In case of a new patient or a patient with a completely new protocol, day care doctors should have proper meeting with the concerned consultant to understand the new protocol. This will reduce the time for Performa performance which otherwise takes longer.
- Some commonly used drugs in chemotherapy should be stored in the department to reduce the time spend in procuring the drugs from pharmacy. After starting the chemotherapy, pharmacy clearance can be done accordingly.
- An ONCOLOGY REGISTER should be maintained in the department in which every change including medicine change, dose change or a patient scheduled for chemotherapy in emergency should be recorded. This will help greatly in decreasing long time taken in Performa preparation.

