

**Summer Training at
Max Super Specialty Hospital,
Saket, New Delhi**

- **Study on Devition From Standard Protocol in Dialysis Unit at
Max Saket, Hospital**
- **Study on Hospital Fire Exit and Evacuation Plan**

**By
Priyanka Maini**

**Under the guidance of
Dr. Suresh Joshi**

**MBA Hospital and Health Management
2015-2017**



**The IIHMR University, Jaipur
2016**

CERTIFICATE

This is to certify that **Dr. Priyanka Maini** student of **MBA in Hospital and Health Management, 2015-17** from the IIHMR University; Jaipur has undergone summer training at **Max Superspeciality Hospital, Saket** from 1st April to 31st May, 2016.

The candidate has successfully carried out the study designated to her during summer training and her approach to the study has been sincere, scientific & analytical.

The internship is in fulfilment of the course requirements.

I wish her all success in future endeavours.



Col. (Dr.) Ashok Kaushik
Dean (Academics & Student Affairs)
IIHMR University, Jaipur



Dr. Suresh Joshi
Professor
IIHMR University, Jaipur

INTERNSHIP CERTIFICATE FROM MAX SAKET

This is to certify that Dr Priyanka Maini, a student of IHMR-Jaipur PGDHM-20 has carried out a project on "*Hospital Fire safety and Evacuation Plan, Max Saket*"

This project work has been prepared by the student herself with utmost sincerity and this work has not been presented earlier for any academic activity.

I wish her all the very best & success in her further future endeavours.



Dr. Neha Chandra
Assistant General Manager (Medical Quality)



Dr. Sandeep Mori
Deputy Medical Superintendent
Max Super Speciality Hospital (West Block)
1, Press Enclave Road, Saket, New Delhi-110 017

ACKNOWLEDGMENT

I take this opportunity to express my profound sense of gratitude and indebtedness to all those who helped me throughout the duration of the project.

I would like to acknowledge, First and foremost Dr. Sandeep Mor my Mentor at Max Saket, for showing confidence in me and Dr. Tanvi Chhabra (Programme Manager-Medical Administrator) for giving me such a wonderful topic to do my project & Dr. Sahar Qureshi, without her support and guidance it would not have been possible. Also I would like to thank Dr. Neha Chandra (Assistant General Manager-Medical Quality) for trusting me and encouraging me throughout the completion of the project & Dr. Tanya Vaish (Medical Quality) whose support was very essential in the completion of my project. I would also like to thank Mr. Deepak Fansal & Mr. Arjun Singh Rawat for his guidance, motivation and encouragement throughout the completion of Project. Also, I would like to express my gratitude to Dr. Ashish Tripathi (Assistant Manager- Medical Administration) as he has been a Great source knowledge, information and inspiration to do work with utmost diligence and sincerity.

I would also like to thank Dr. Nalini Kaul (Medical Superintendent) without whose permission I would not get this golden opportunity to do my internship in this esteemed hospital.

I would also like to thank my faculty at IIHMR-Jaipur and specially my Mentor- Dr. Suresh Joshi (Professor) and also feel privileged to acknowledge, Ms. Bhavya Arora for being my support all through the internship.

I would also whole heartedly thank the entire staff at Max, Saket for being so supportive and helpful and taking out some time from their hectic schedules and giving all the required information, especially Security and Engineering Department.

At the end, I am thankful to God and my heartfelt gratitude to my parents and friends who supported me throughout the course.

THANK YOU ALL

Dr. Priyanka Maini

IIHMR

(2015-2017)


Dr. Sandeep Mor
Deputy Medical Superintendent
Max Super Speciality Hospital-(West Block)
(Deputy Medical Superintendent)
Press Enclave Road, Saket, New Delhi-110 017

DECLARATION

I do hereby declare that I am a student of 1st year, MBA in Hospital and Healthcare Management, IIHMR University, Jaipur, Rajasthan session 2015-2017.

I would like to state that I have made my projects under the guidance of Dr Sandeep Mor (Deputy Medical Superintendent) Dr Tanvi Chhabra (Programme Manager-Medical Administrator) and Dr Neha Chandra (Assistant General Manager-Medical Quality) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfilment for the degree of MBA in Hospital and Healthcare Administration.

This project work is my own and has not been submitted to any of the other Institute or University for the purpose of award of any degree or diploma.

Dr. Priyanka Maini

IIHMR University

(2015-2017)

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Dr. Priyanka Maini

IIHMR

(2015-2017)

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ABBREVIATIONS

Sr.No.	Abbreviation	Meaning
1.	AAMI	Association for the Advancement of Medical Instrumentation
2.	ABG	Arterial Blood Gas
3.	BBV	Blood Borne Viruses
4.	CABG	Coronary Artery Bypass Graft
5.	CAPEX	Capital Expenditure
6.	CAUTI	Catheters associated urinary tract infections
7.	CDC	Centres for Disease Control and Prevention
8.	CLABSI	Catheter linked associated bloodstream infections
9.	COW	Computer on Wheels
10.	CPRS	Computerised Patient Record System
11.	CSSD	Central Sterile Services Department
12.	CTVS	Cardiac Thoracic Vascular Surgery
13.	ECC	Emergency Control Centre
14.	HAI's	Hospital Acquired Infections
15.	HIS	Hospital Information System
16.	ICPs	Infection Control Practitioners
17.	IPS	International Patient Services
18.	LAMA	Leave Against Medical Advice
19.	LASA	Look alike Sound alike
20.	U/G	Underground
21.	CPR	Cardio Pulmonary Resuscitation
22.	NABH	National Accreditation Board for Hospitals & Healthcare Providers
23.	IRT/ ERT	Initial Response Team/ Emergency Response Team
24.	SCR	Security Control Room
25.	PAC	Pre-Operative Assessment Clinic
26.	GDA	General Duty Assistant
27.	F& B	Food and Beverages
28.	BME	Biomedical Engineering
29.	CMO	Chief Medical Officer
30.	TAT	Turn Around Time

INTRODUCTION

Max Healthcare is the country's leading comprehensive provider of standardized, seamless and international class healthcare services. It is committed to the highest standards of medical and service excellence, patient care, scientific knowledge and medical education. Max Healthcare has 14 facilities in North India, offering services in over 39 medical disciplines. Of this, 11 facilities are located in Delhi and NCR and the others in Mohali, Bathinda and Dehradun. The Max Healthcare network includes state-of-the-art tertiary care hospitals in Saket, Patparganj, Shalimar Bagh, Bathinda and Dehradun, secondary care hospitals in Gurgaon, Pitampura and Noida and a speciality centre at Panchsheel Park. The 14 hospitals together have over 2600 beds.

Max Healthcare is a pioneer in the introduction of technology to provide patients with the highest standards in medical care. Examples are the first Brain Suite in Asia at Max Saket and the Electronic Health Record System in use across Max Hospitals. The hospitals are equipped with the advanced medical equipment like state-of-the-art Cath labs, Robotics, OTs with HEPA, Nuclear Medicine, Gamma Camera, LINAC for Radiotherapy and MRI and CT scan machines. Max Healthcare has over 2300 leading doctors, 3300 nurses, 3100 trained staff and has treated over 22,00,000 patients from over 80 countries.

The organization serves as a role model in several areas of clinical care and is sought after by aspiring doctors, nurses and paramedical staff as high quality organization to work for. Reaching here has not been an easy task but has been achieved by the unflinching commitment and support given by leadership team. The leadership has provided consistent strategic guidance, oversight, and has inspired the organization to meet and exceed world class benchmarks. At the hospitals, all this has only been achieved by the passion and preserving efforts put by the Max staff. And most importantly, the trust reposed in us by the patients and their families is testimony of sincerity, devotion and commitment. Our motto at Max Healthcare is "Eager to get patient home".

Max Healthcare follows a core of 'Patient Centred Care'. Widely acknowledged nationally and internationally for its quality patient care, Max has successfully implemented the "Medical Excellence Model" through its clinical team of expert physicians and nurses who work together in an integrated manner, assessing patient needs, ordering tests, planning treatments, scheduling surgeries, monitoring progress and planning for early discharge to home.



The pillars of this model include:

- Clinical governance
- Credentialing and clinical privileging of physicians & nurses
- Use of standardized, evidence based protocols
- Patient and staff safety
- Infection control
- A culture of audit and continuous professional development

Every department of the hospital was observed carefully for its working, staff, hierarchy, physical set up and major challenges faced by them and suggestions were made to overcome those challenges.

The hospital has four key areas of specialties:

- Institute of Cardiac Vascular Surgery.
- Institute of Bariatric & Metabolic Surgery.
- Institute of Oncology
- Institute of Nephrology.

MODE OF DATA COLLECTION

Data collection involved discussions with the HODs on the managerial issues and talking to the other staff and going through the records.

Sources of Data

- Primary

- By interacting with the HODs, executives, Doctors and other employees of the hospital.
- By interacting with the patients and their attendants.
- Through direct observations.

➤ Secondary

- Through registered records
- Through website of the hospital
- Literature available about the hospital like magazines, pamphlets, brochures, CDs, written documents

GENERAL FINDINGS

FRONT OFFICE

- **First contact point** between the patients / their attendants coming to the facility.
- Gives directions to them about the locations of various departments..
- Performs in patient and out- patient registration.
- Does appointment scheduling of the patients.
- Makes doctors' available summary.
- Insurance management.
- Does registration and scheduling of preventive health check-ups.
- Helps in planning timely discharge a day before by inquiring about the same from the concerned consultants

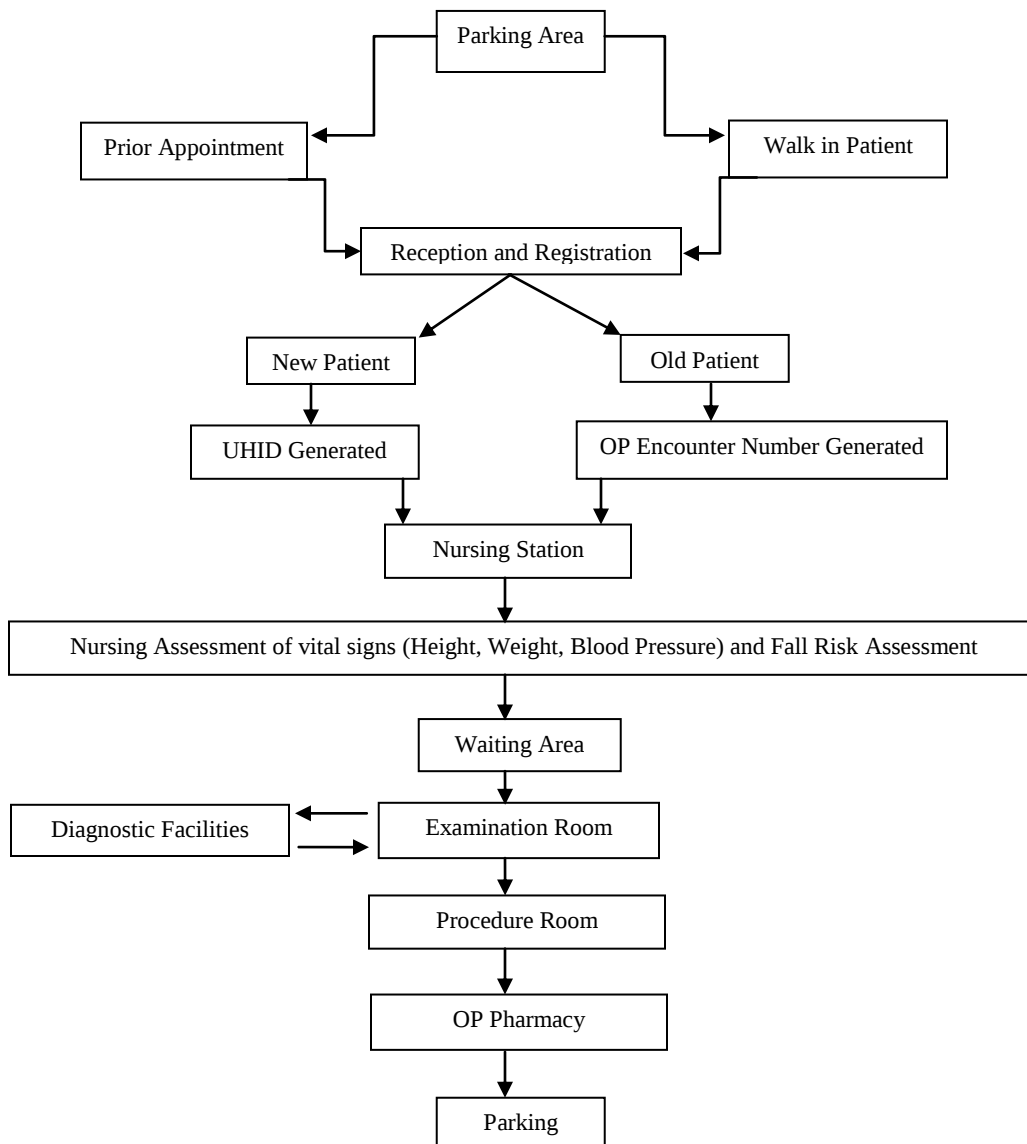
Challenges

- Shortage of staff
- Huge rush during peak hours, 9am-10pm

OUT-PATIENT DEPARTMENT

- Each INSTITUTE of Max Saket hospital has its own OPD area as well as IPD area / day-care area wherever applicable with doctor's chambers and procedure rooms.
- 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.
- In case of a new patient, registration is done which is valid pan-Max and for life time of the patient and a UHID is created which becomes a unique identification for all his health related information.
- For Chairpersons and senior doctors, a junior doctor does the initial assessment of the patient, which not only reduces the workload of the senior doctors (whose slots are always overbooked), but it also gives the junior doctors an opportunity to learn from the best brains in the industry.

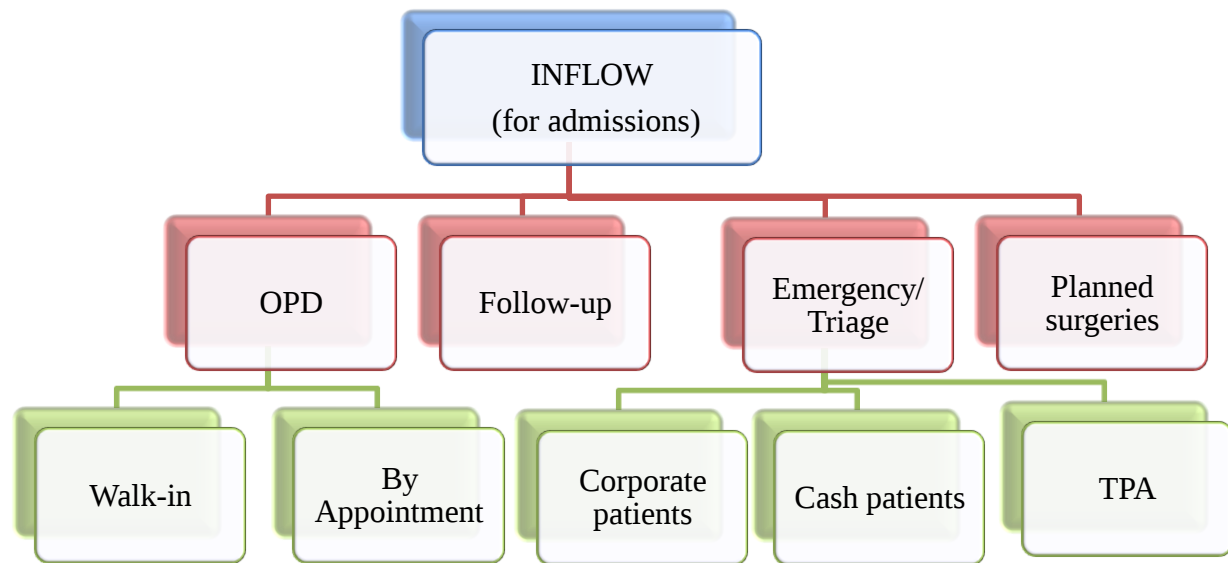
The general process flow that is followed in all the OPDs is as follows:



ADMISSIONS DESK

- If the patient has to be admitted to the hospital, he/she first reports to the admissions desk wherein all the paperwork is completed, do's and don'ts as well as patient's rights and duties are explained to him. An initial token amount is deposited here by the patient which is according to his preference of the room (be it economy, single, twin sharing or suite)
- In case of TPA patients, the admission has to be reported to the insurance company within 24 hours.
- STAFF – 70-80; work in shifts with TPA staff working only from 5-5.

ISSUES- Huge departmentalisation which causes co-ordination problems



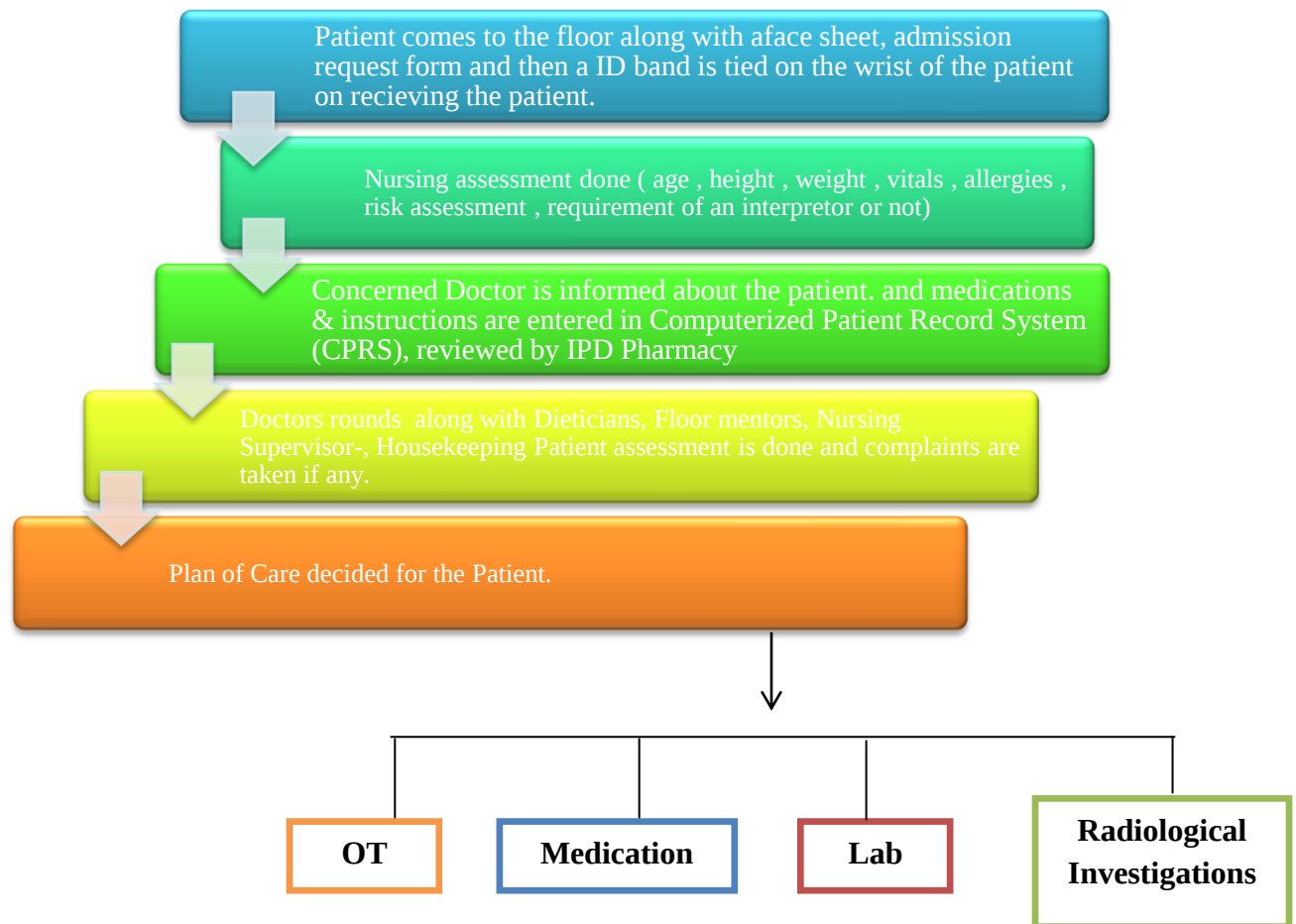
By appointment-Phone call- 8860444888

Hierarchy-

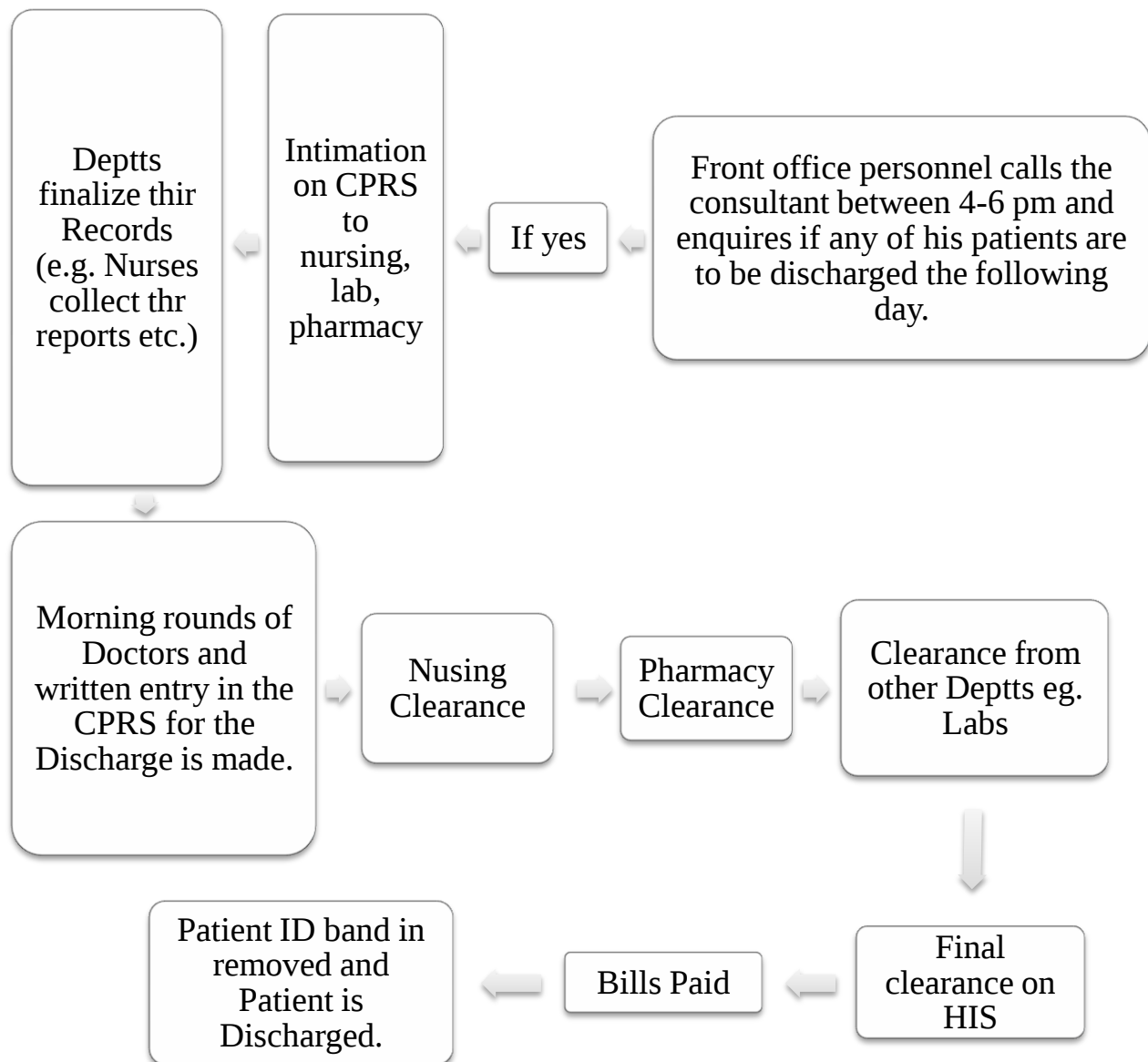


IN-PATIENT DEPARTMENT (IPD)

- IPD is distributed over six floors (GF, 2nd-6th) in the east wing and over five floors (2nd-6th) in the west wing of Max hospital including a total number of 229 beds in east and 132 beds in west.
- Every bedside has:
 - Details of Consultant, Nurse and Mentor written at the top of every bed
 - Room equipment checklist – side rails, Oxygen, Suction, "Safety First Bell"
 - Important Instructions
- The rooms available in IPD have the following structure of beds per room:
 - Economy room – 4 beds per room.
 - Double – 2 beds per room
 - Single Deluxe
 - VIP suite
- Every floor has a central nursing station with
 - Information Board covering:
 - Designation & Contact numbers of
 - Duty doctor
 - Administration Staff
 - Floor Mentor
 - Support Staff
 - Ward Secretary
 - Bed Manager
 - Nurses' names with shift timing and designation(8-10 nurses per shift) and allotted room numbers.
 - Crash Cart parked next to the nursing station
 - Computer on wheels (COW) - 4
 - Cupboards with forms- down time form, investigation track sheet, blood request form, PAC sheet, informed consent, inventory files and registers
 - Medication rooms – 2 ;Pantry – 1
 - Records room
 - Biomedical Waste Disposal
- Nurse to bed ratio = 1:5 or 1:6
- General Duty Assistants (GDAs) = 2-3 in every shift
- Average Length of Stay (ALOS) for normal Laparoscopic surgeries = 2-3 days
- Quality Indicators are: Patient Fall, Hypoglycaemia, Needle stick Injury
- Process of admission of new patient to IPD as shown below:



- **BARRIER NURSING-**
Isolation of the patient in case the blood or urine culture of the patient has been tested positive for any infection so that the infection doesn't spread to others.
- **REVERSE BARRIER NURSING-**
Done in cases where patient is immuno compromised so that infection doesn't travel to him from others.
- Process of Discharge of patient from IPD.



EMERGENCY DEPARTMENT

Due to the unplanned nature of patient attendance, this department provide 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, Suction Cardiac Monitor, Defibrillator, Oxygen Pump) and 2 BCLS (Ferno Stretcher, Oxygen Pump).

Patients are either transferred to other departments or are discharged within 4 hours. Max Super Speciality 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.

Response time:

- EMO response time <1 min Consultant response time <60 min
- Code blue response time 2-3 min
- Ambulance response time <10 min

Infrastructure:

- Total 16 bedded triage
- Resuscitation suite -1 bed
- Urgent care area – 4 beds
- Observation area – 9 beds
- Clinical decision unit – 2 beds
- Doctors work station-is located in the centre of the urgent care area
- Store room- is located behind the reception. Medications are filled twice a day and stock of two days is kept in advance for Sunday. Narcotics are also available and kept in double lock and key system.
- Hospital information system and CPRS
- COWS(computer on wheels)

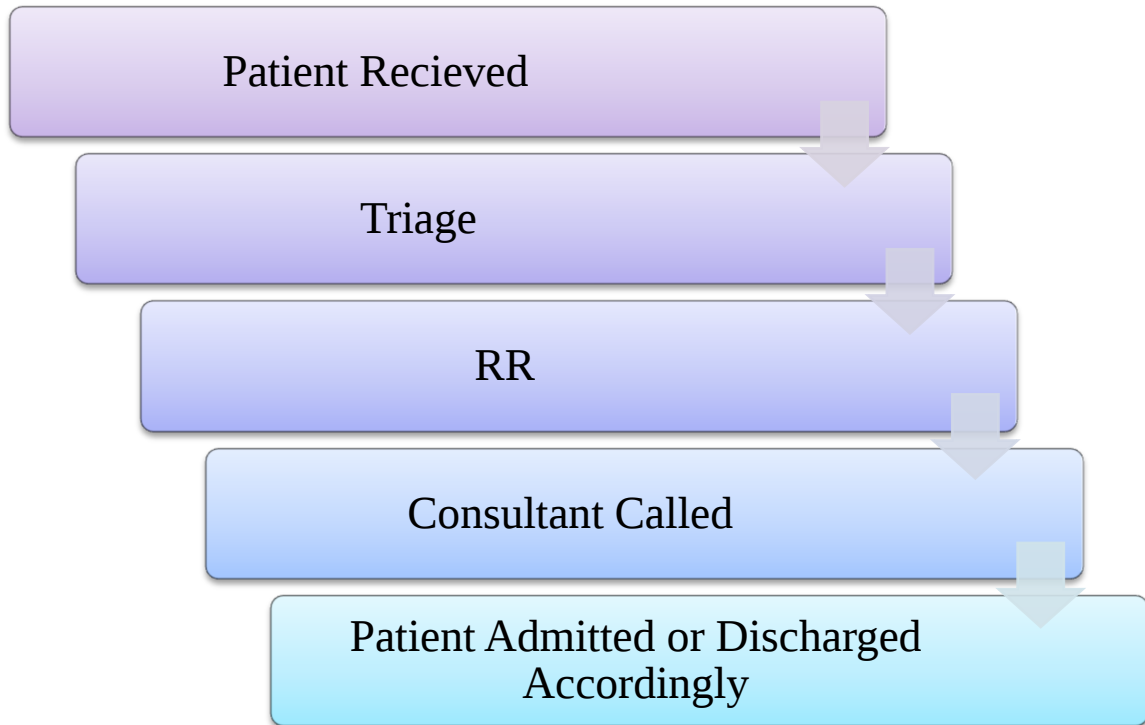
Waiting area for patient's attendants is outside the department

Staffing:

1. Senior Consultant (Emergency medical officer)
2. 4 Doctors
3. Team Leader
4. Emergency Physicians - 3
5. Nurses : 32 (8 nurses per shift)
6. 2 personnel at reception

7. Paramedical staff for ambulance
8. 4 GDA per shift
9. Outsourced Staff: Security Personnel.

Process Flow



OPERATION THEATER COMPLEX

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

Organization of staff: The staffs of Operation Theatre are organized into following four groups:

Anaesthetist and Surgeon, Nursing Staff, Technician, Supportive Staff.

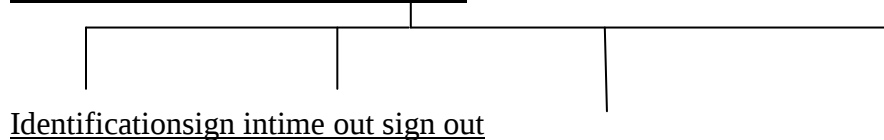
- Average number of cases done per day – 30 in each wing
- Temperature- 21 approximately
- Humidity – 50-55
- Light – 2000lux in the centre of OT table and decreases on moving farther

- OT booking is done through online. 2 types of surgeries are performed – *elective*: surgeon gets PAC done and gives an appointment; *add on*: manual booking of OT in case there is cancellation of the scheduled cases due to any reason.
- Each OT complex has a separate material store and a TSSU(Theatrical Sterile Supply Unit).
- Staffing ratio- Nurses : patients – 4:1(pre-op) ; 2:1(post-op)
Technicians: patients- 1:1
- OT Utilisation – average is 70%

Max Super Speciality Hospital recently got a GREEN OT certificate which signifies minimal amount of pollution caused by OT gases and acceptable standards of practices being followed here

- Sterilisation is done by ETO (12 hrs); autoclave. Fumigation is done twice aday in the morning and evening.
- Bio medical waste disposal is done every 2 hours.
- No. Of pre-op beds -3
- No. of post-op beds -4

- Surgical safety check list includes



- Quality indicators: wrong patient , wrong surgeon , wrong surgery , return to OT(within 7 days) , waiting time for OT

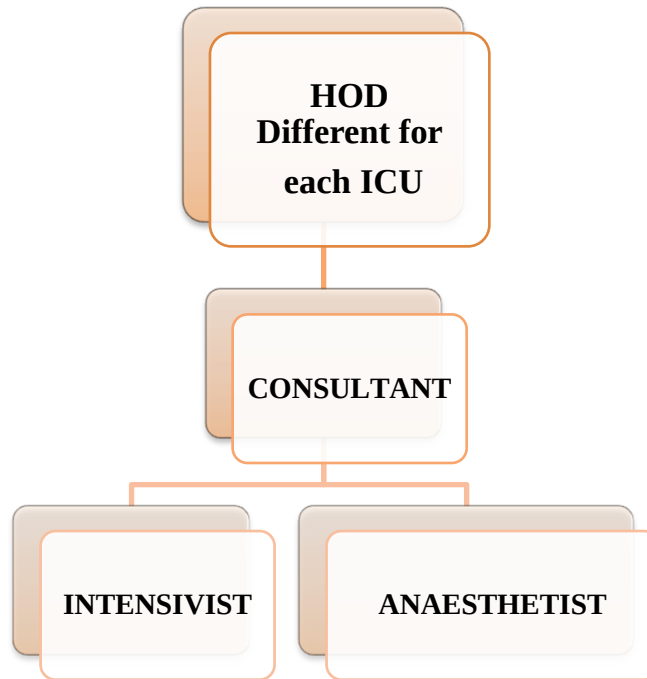
INTENSIVE CARE UNIT (ICU)

Max Saket has a total of 7 Intensive Care Units in the Hospital:

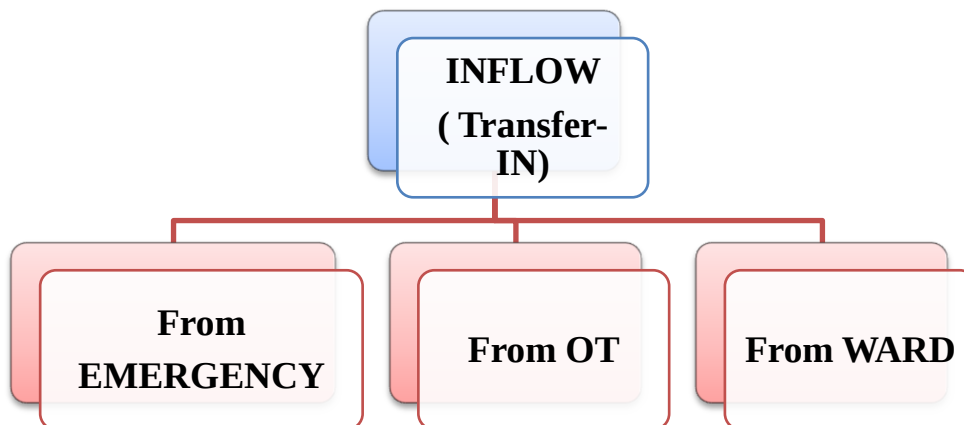
1. Respiratory ICU – 8 Bedded
2. Medical ICU – 8 Bedded
3. Neonatal ICU – 8 Bedded
4. Apex Coronary Care - Bedded
5. Stroke and Neuro Medical ICU - Bedded
6. Neurosurgical ICU – 8 Bedded
7. CTVS ICU - Bedded

All Intensive Care Units have a 24 hour service of Intensivist and an Anaesthesit

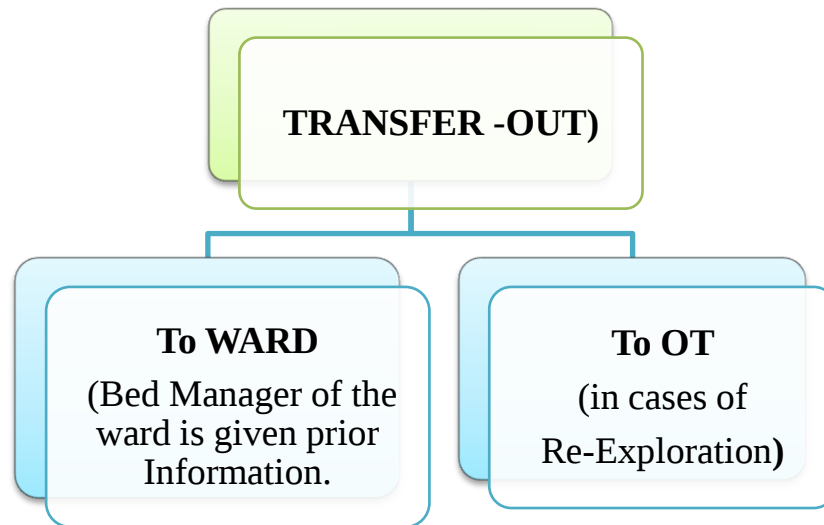
Hierarchy



Patient Flow



Beforehand information is given on call to the ICU for *transfer-in* of the patient.



- Patient: nurse – 1:1(for all patients)
- Patient counselling – done throughout the day; Relative counselling – done twice a day by the Intensivist .
- Protocol for infected patients –
 - Isolation
 - Visitor's policy- no visitor allowed inside the isolation room
 - Aseptic policy
 - Full PPA
 - Separate linen disposal in separate bags
 - Separate dressing trolley
 - Separate housekeeping material- dusters, mops etc
- Quality indicators-
 - Patient falls
 - Bed sores
 - Medication error
 - Nosocomial infections

All the Quality indicators are duly noted in “Quality Flash” and it is audited time to time and measures are taken to reduce the number of incidents.

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, angioplasty and cath study is done in cath lab 1 and EPS is done in cath lab 2.

Other procedures are:

- Percutaneous Transluminal Coronary Angioplasty
- Peripheral Transluminal Angioplasty
- Radio Frequency Ablation
- Permanent Pacemaker Implantation
- Intra Cardiac Defibrillation
- Cardiac Resynchronisation Therapy Defibrillator Device
- Cardiac Resynchronisation Therapy Pacemaker
- Left and right sided pressure studies
- Closure of some congenital heart defect

Slots are booked for everyday as per the doctors' and patients' convenience. About 70% of the slots booked are treated everyday

Units of Cath Lab:

1. Cath lab 1
2. Cath lab 2
3. Technical room
4. Observation area
5. Technician room
6. Store room and utility room
7. Observation area-7 Beds
8. Instrument washroom

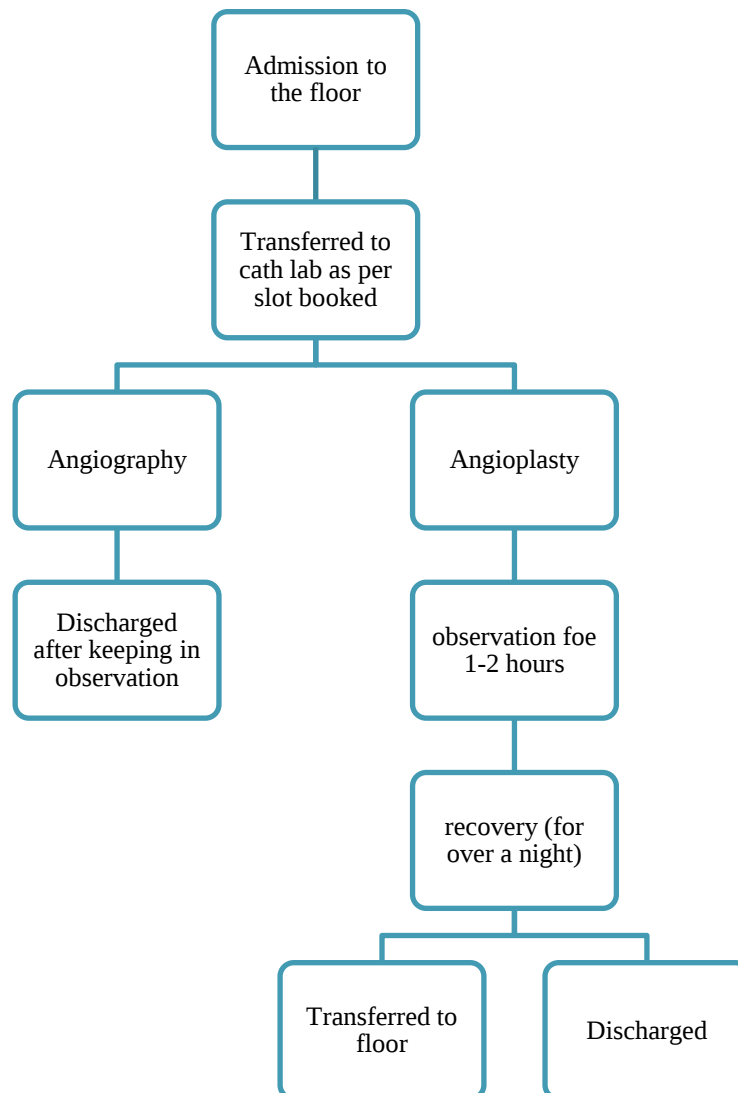
Location:

Cath Lab is located on the first floor with the vicinity areas as:

- Emergency department
- Operation theatre
- Cath recovery-14 Beds
- Coronary care
- CTVS OT

- SICU
- PICU
- MICU

Process Flow of Patients



DEPARTMENT OF LAB SERVICES

INTRODUCTION-

An ISO 9001:2000 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.

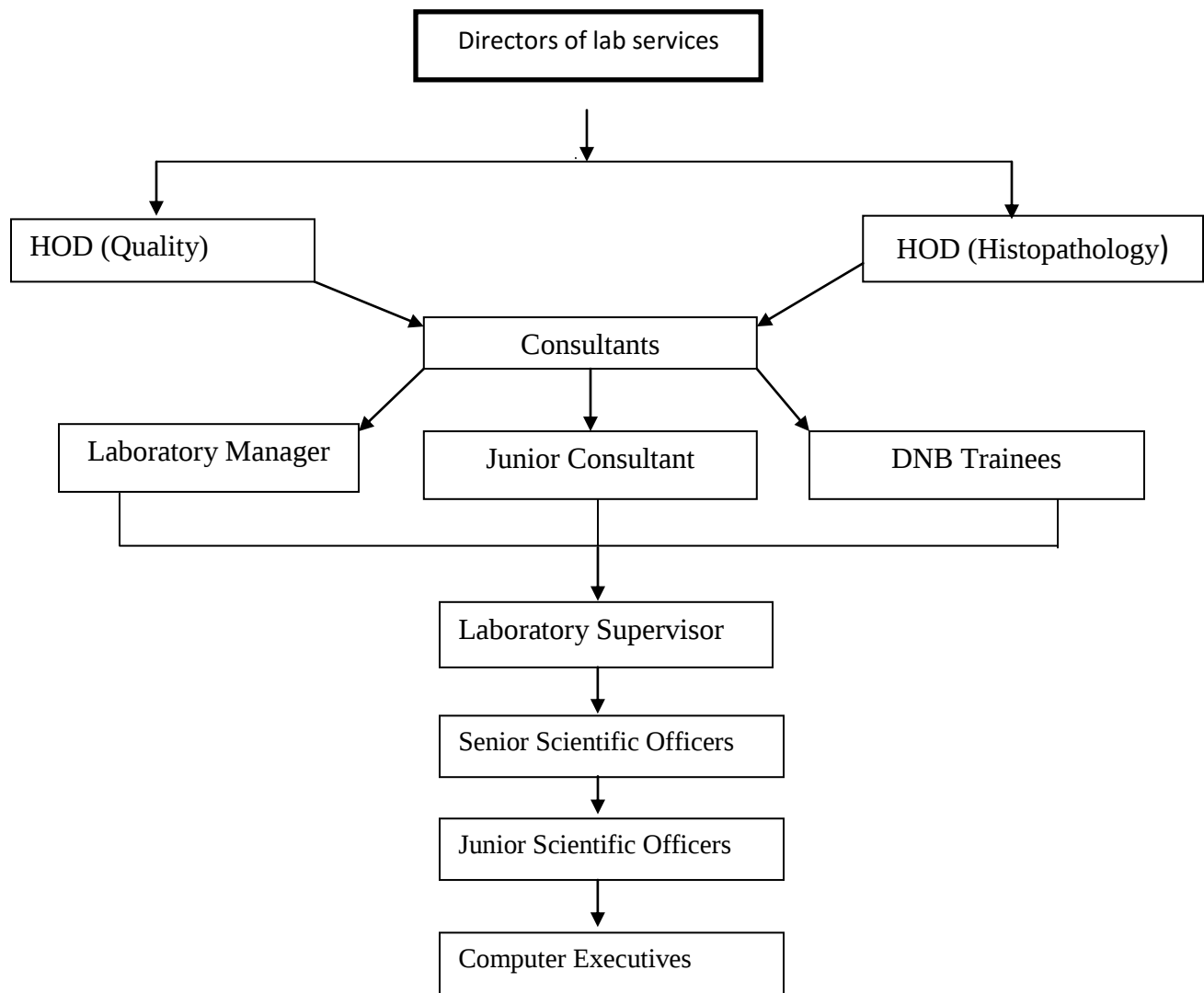
LABORATORY COMPRISES OF THE FOLLOWING DEPARTMENTS-

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

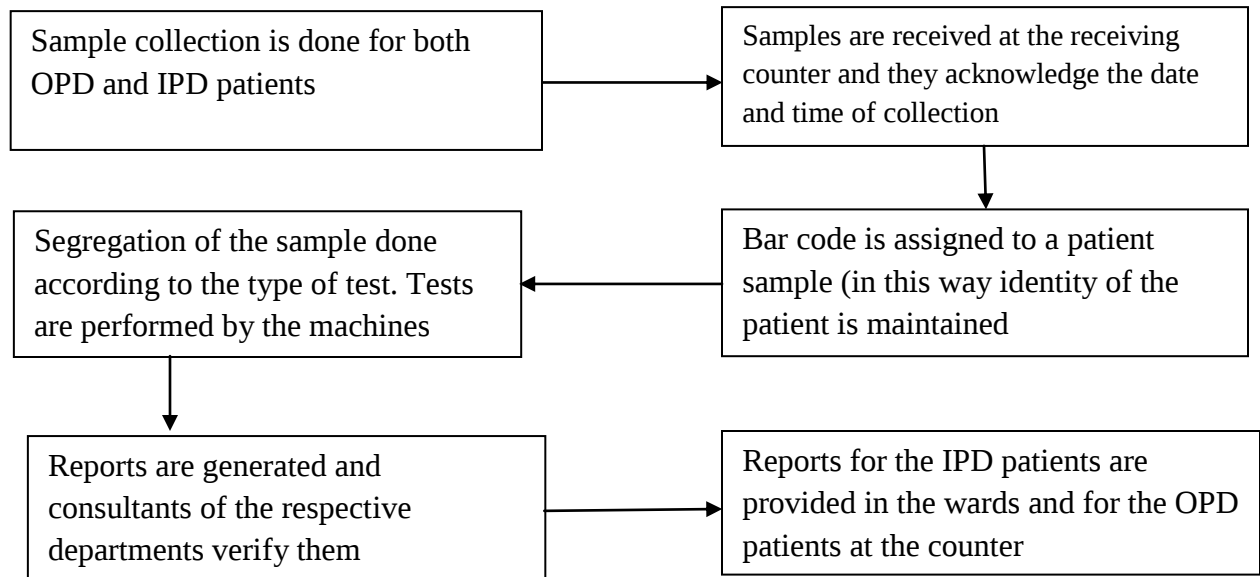
HIERARCHY-

Lab is broadly divided in two (2) departments as mentioned below:

- Lab medicine
- Histopathology



PROCESS FLOW-



LABORATORY INFORMATION SYSTEM-

It is connected with hospital information system

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

RADIOLOGY DEPARTMENT:-

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

The total staff working in the Radiology Department is 60.

Procedures followed in the department as mentioned below:-

(1) Routine X-Ray:

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

(2) Routine ultrasound:

- (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)

Department is divided into two parts:-

1) For Ultrasonography, Mammography, Dexascan

2) For CT scan, MRI, X-ray, Fluoroscopy

Department Layout consists of following:-

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 CT 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

Process Flow in Radiology Department (OPD)

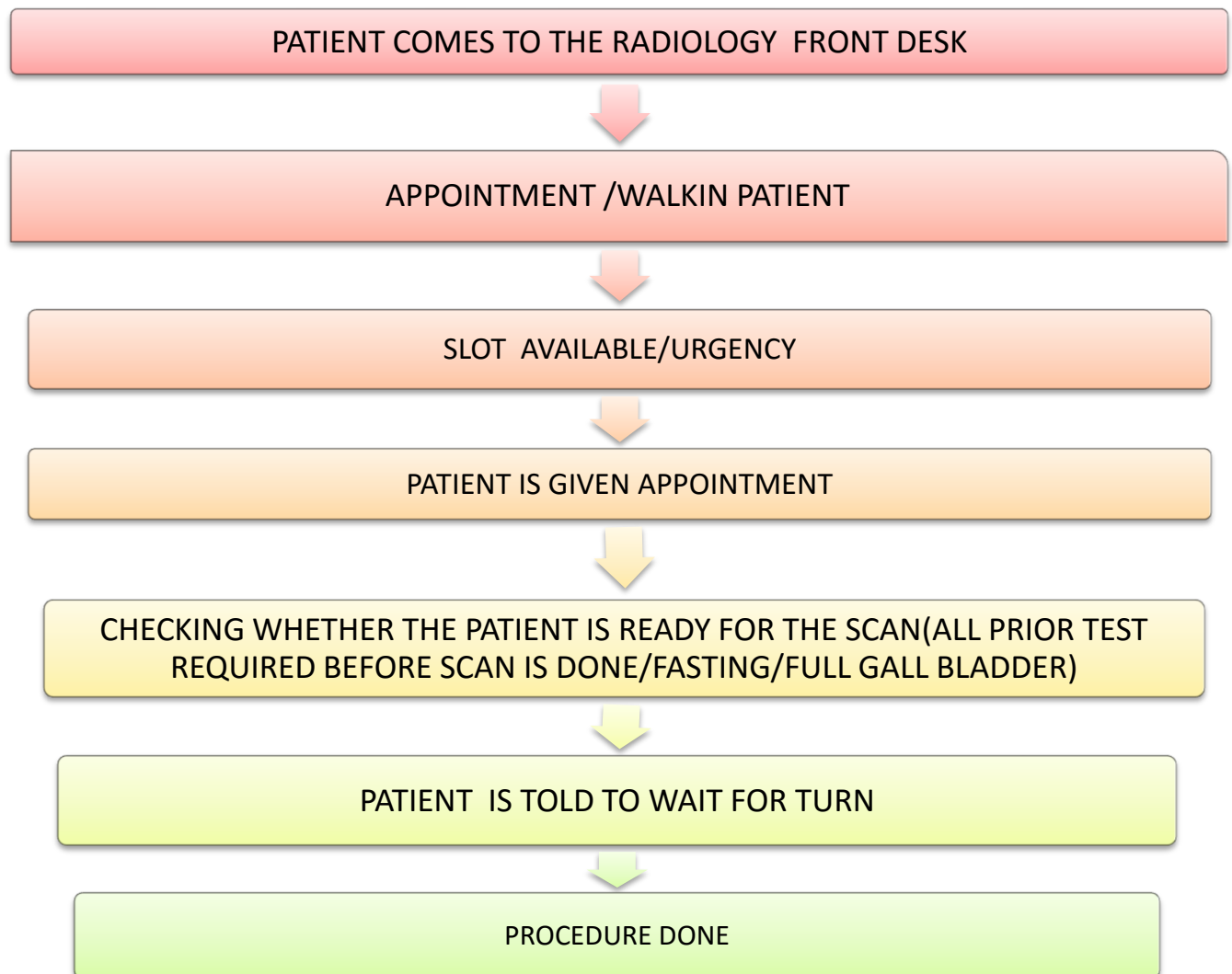


Figure:Process flow in radiology department for outpatients.

For walk-in patient, slot availability is checked 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 told to wait for his turn to perform final procedure for scan.

- Emergency patients especially with a critical diagnosis, highlighted in the register and the consultant is immediately informed about the findings.
- Procedures wherein contrast is to be given, for example MRI, consent of the patient is taken prior to the procedure.

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 consist 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 have several components including red blood cells platelets and
PlasmaDonor 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.

- The Department is headed by Dr.SangeetaPathak and the technical manager is Ms.Ruchi.
- The blood donation timings are from 9am to 5pm and approximately one volunteer comes for donating blood. Blood can be donated after every 3 months.
- The PRBC are stored for 45 days at 2-6 degree Celsius.
- The Platelets are stored for 5 days at room temperature 22± Celsius.
- The FFP (Fresh Frozen Plasma) are stored for 1 year at -40 degree Celsius.

CENTRAL STERILIZATION SERVICE DEPARTMENT

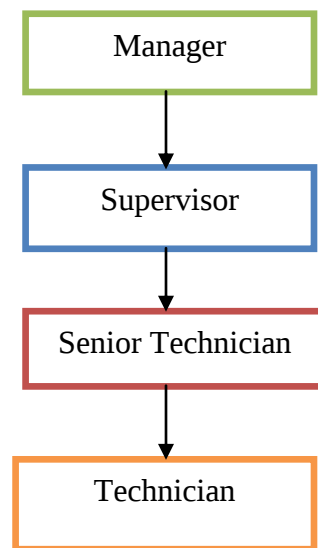
INTRODUCTION-

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} .

HIERARCHY OF THE DEPARTMENT-



Department is headed by Dr. Sanjeev Bhatia.

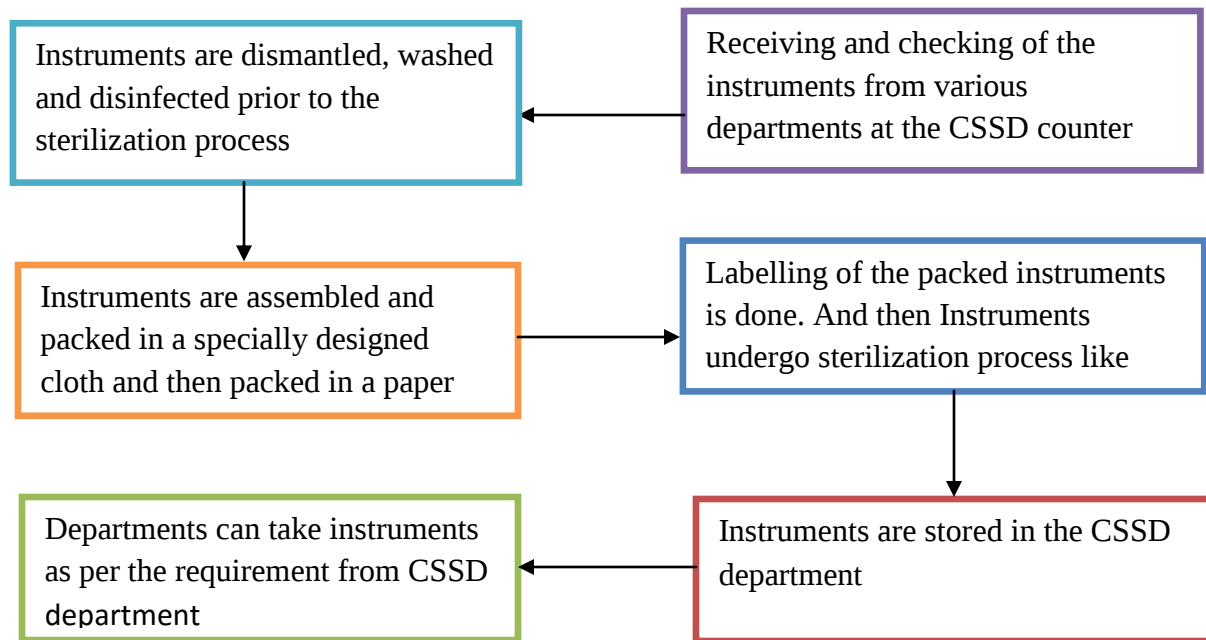
ZONES PRESENT-

- Decontamination
- Clean
- Sterile

Colour coding for the following zones -

- Decontamination- Red Colour
- Clean- Blue colour
- Sterile- Green colour

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-

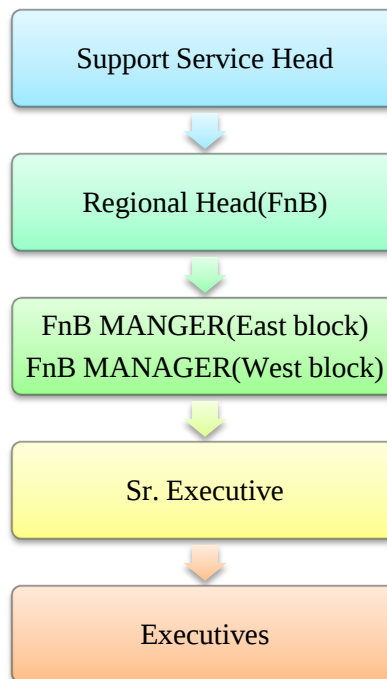
QUALITY INDICATORS-

Below mentioned quality indicator is used in CSSD:

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

FOOD & BEVERAGES

- Food & Beverage department is responsible for the supply of food to the in-patients and sometimes their attendants (if required) and also for arranging food during various meetings and conferences in the hospital.
- The department has been outsourced to sodexopvt, ltd., however, the management and supervisory staff is in-house.
- Staff- 230 (outsourced) ; 11 (Max in house)
- Hierarchy

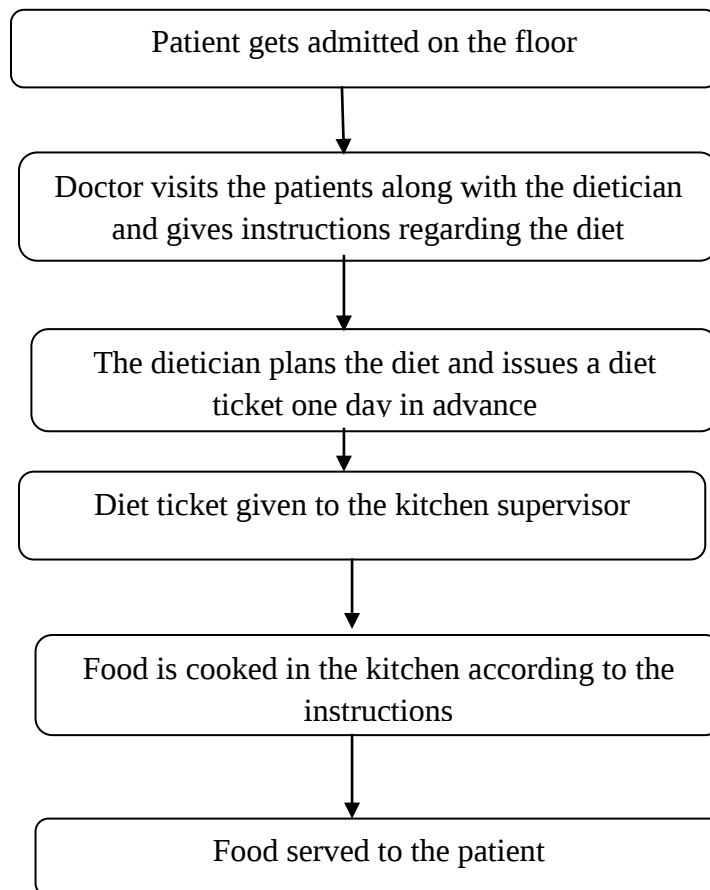


Time table for the diet of the patient

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

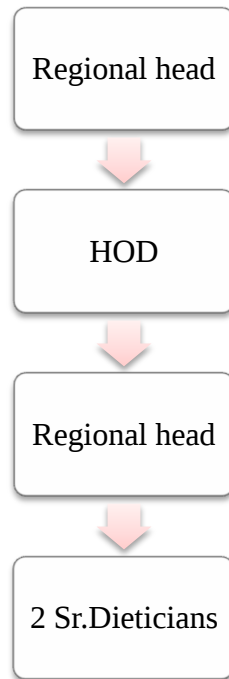
- Dinner of the same day, breakfast and lunch of the next day are decided prior in the evening and diet tickets are issued by the dietician and given to the chef.

- 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 menus offered are:
 - Continental
 - Afghani – for middle east patients
 - No onion and garlic – for middle east patients
 - Indian
- **Process flow** of the department as shown below:



DIETETICS

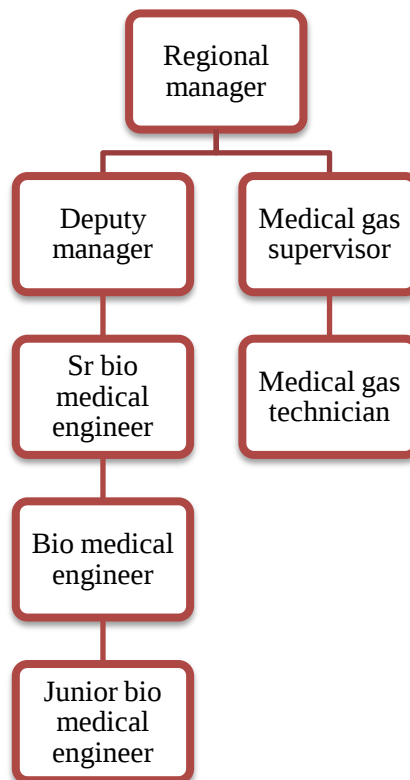
- The department plans diet for all IPD patients in accordance with the primary consultant's opinion on the same.
- Staff- 13 in total.
- Hierarchy



- Dietician: patient – 1:50
- Assessment of each patient to be done within 24 hours of admission and thereafter every 8th day after initial assessment.
- For enteral nutrition, all commercial supplements for each disease are available.

BIOMEDICAL ENGINEERING

- This department deals with purchase, installation and commissioning, training on operating, handling and maintenance of medical equipment in all departments of the hospital.
- Looks after running equipment and new equipment.
- For Running equipment
 - Preventive maintenance is done – to prevent breakdown, maintenance is done.
 - Calibration is done – i.e. to check how accurate an equipment is functioning
 - Breakdown call is checked for
 - Depreciation is measured
- For new equipment
 - Installation and commissioning is done.
- AMC and CMC records are maintained.
- CAPEX(Capital Expenditure) and OPEX(Operating Expenditure) registers are maintained.
- Equipment Incident report is made in case of any physical damage – it is filled mentioning how the damage did happened. Thereafter replacement or repair whatever is required is done.
- Organisational chart



- Gas manifolds are also handled by this department and Max is awarded green OT certificate because of the efficient dispersion of OT gases.

PHARMACY

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.

INDENT AND DISPENSE OF MEDICATIONS.

In patient pharmacy-

In CPRS, Medication orders posted by the clinicians is verified by pharmacist on PUTTY System labelled with (patient info, SSN no., drug name,) then the medications are dispatched after Billing via HIS (Hospital information system) and finally handover to GDA to dispense medicines. The Stat orders required immediately are dispensed within 30 minutes. The normal order is dispensed within 1 hour and routine order is delivered by 1 round per day.

NARCOTICS DRUGS:

They are kept in double lock and key system. Documentation of narcotic drugs is appropriately maintained.

Narcotics drugs under statutory regulation being used in max hospitals includes: injection and transdermal patch of Fentanyl and injection and tab. of Morphine.

LOOK ALIKE AND SOUND ALIKE DRUGS:

Look alike and sound alike medications have high medication error due to similarities in nomenclature and packaging.

In the main pharmacy stores, (SALA Medications) are stored separately in 2 adjacent racks with blue coloured sound alike and pink coloured look alike medications warning stickers to avoid confusion while dispensing.

Medication Recall: If a drug is found to be defective, it is reported to the Okhla office where the records for that particular series of drugs dispensed is checked and verified for medication recall.

Licences acquired by Max hospital pharmacy -

- 1) Pharmacist License
- 2) Narcotics License

INVENTORY MANAGEMENT PARAMETERS

I. ABC Class

- A Items: 7 days
- B Items: 10 days
- C Items: 15 days

II. EOQ - (economic order quantity)

III. LEAD TIME – Time from ordering to delivery of drugs

IV. VED – Vital Essential Desirable (According To move of drugs)

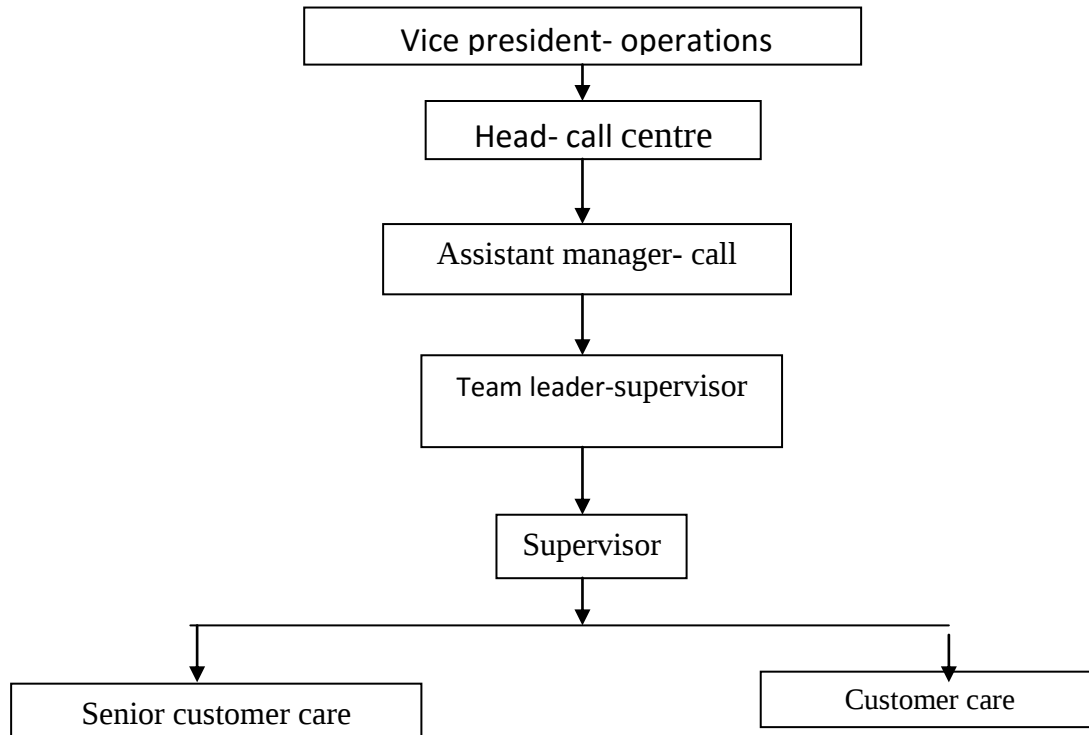
CALL CENTRE

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
 - Speciality information
 - Other department information
 - It handles internal emergency e.g. Blue code
- Main board line number is: 26515050

Organization chart:



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.

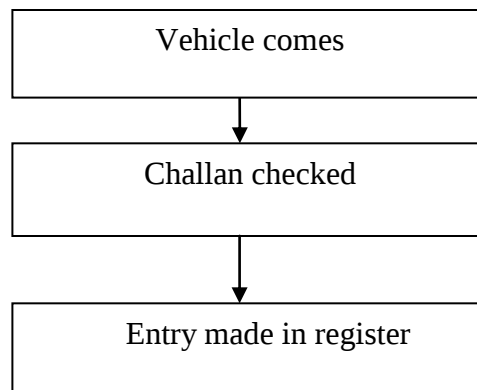
Functions of Security Department:-

1. Security management:-

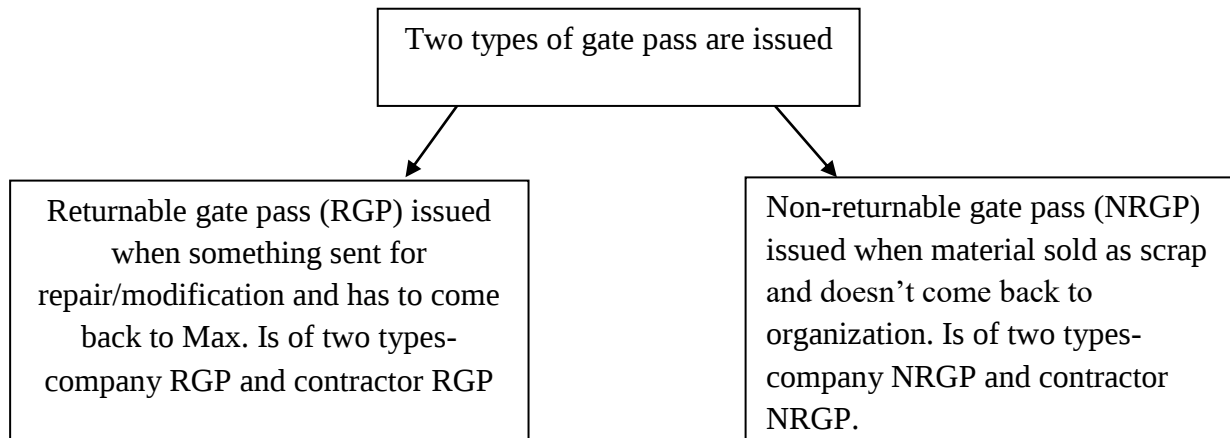
- Selection of people(guards and supervisors)
- Deploying of security staff to different floors and departments
- Checking of people entering hospital
- Turnout and grooming of security staff
- Training of security staff
- MLC handling
- Dispute handling

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.

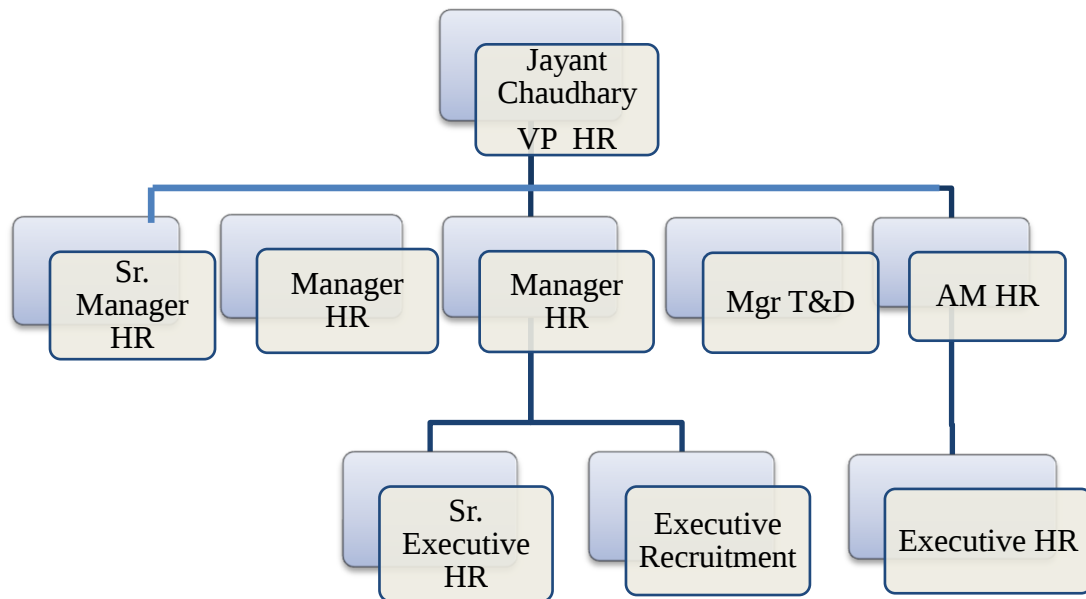
HUMAN RESOURCE MANAGEMENT

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



INTERNATIONAL PATIENT SERVICES (IPS) 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:

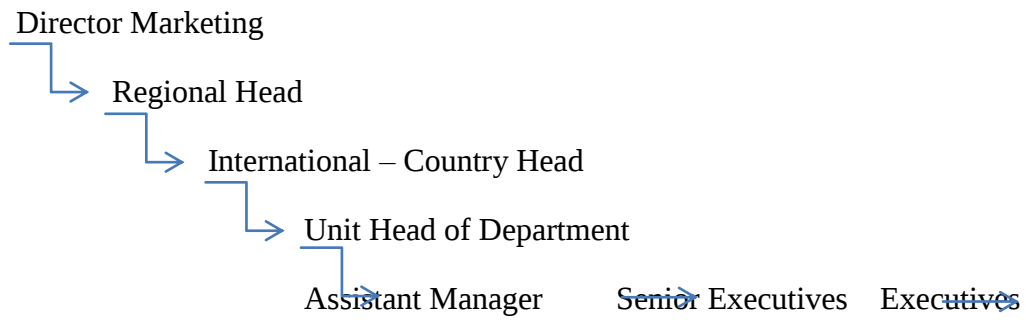
- Max hospital conducts free outreach OPDs in other countries, at least 1-2 per year
- Max hospital also has tie ups with different hospitals in these countries

International patients avail treatment in India mainly because these facilities or treatments are not available in their respective countries, and are available at a much cheaper price in India than other countries such as US, UK or European countries. The countries from where patients come to seek treatment most commonly are Iraq, African countries (Nigeria, Congo), Oman, Uzbekistan, Afghanistan, Nepal, and Bangladesh.

The hospital provides:

- Various Regional Translators such as Arabic, Persian, Iraqi, Bangladeshi and Russian (In house interpreter).
- Assistance in ground transportation such as finding a shuttle, hiring a car or choosing any other mode of transportation within the city.
- Relationship Managers, who closely work with over 50 Diplomatic Missions and numerous Expat bodies to ensure that international patients have a comfortable and memorable stay in India.

Staffing:





A STUDY ON
“DEVIATION FROM STANDARD PROTOCOLS IN DIALYSIS UNIT”

AT

MAX SUPERSPECIALITY HOSPITAL, SAKET



Institute of Health Management Research, Jaipur

DECLARATION

I do hereby declare that I am a student of 1st year, MBA in Hospital and Healthcare Management, IIHMR University, Jaipur, Rajasthan session 2015-2017.

I would like to state that I have made the “A STUDY ON DEVIATION FROM STANDARD PROTOCOL IN DIALYSIS UNIT” under the guidance of Dr TanviChhabra(Programme Manager-Medical Administrator) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfilment for the degree of MBA in Hospital and Healthcare Administration.

This project work is my own and has not been submitted to any of the other Institute or University for the purpose of award of any degree or diploma.

Dr. Priyanka Maini

IIHMR University

(2015-2017)

ACKNOWLEDGMENT

A Summer project is a golden opportunity for learning and development. I consider myself fortunate for having been provided an opportunity to undergo Summer training at Max Super Speciality Hospital, Saket, New Delhi.

I take this opportunity to express my profound sense of gratitude and indebtedness to all those who helped me throughout the duration of the project.

I would like to acknowledge, First and foremost Dr. Tanvi Chhabra (Programme Manager- Medical Administration) for showing confidence in me and giving me such a wonderful topic to do my project & Dr. Sahar Qureshi, without her support and guidance it would not have been possible.) Also I would like to thank my mentor at Max Hospital, Saket Dr. Sandeep Mor, for his guidance throughout my internship period and encouragement throughout the completion of Project. Also, I would like to express my gratitude to Dr. Ashish Tripathi (Assistant Manager- Medical Administration) as he has been a Great source knowledge, information and inspiration to do work with utmost diligence and sincerity.

I would also like to thank Dr. Nalini Kaul (Medical Superintendent) without whose permission I would not get this golden opportunity to do my internship in this esteemed hospital.

I would also like to thank my faculty at IIHMR-Jaipur and specially my Mentor- Dr. Suresh Joshi (Professor) and also feel privileged to acknowledge, Ms. Bhavya Arora for being my support all through the internship.

I would also whole heartedly thank the entire staff at Max, Saket for being so supportive and helpful and taking out some time from their hectic schedules and giving all the required information, especially Security And Engineering Department.

At the end, I am thankful to God and my heartfelt gratitude to my parents and friends who supported me throughout the course.

THANK YOU ALL
Dr. Priyanka Maini
IIHMR
(2015-2017)

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INTRODUCTION

Max super speciality hospital is one of the premier names in healthcare domain in the world. It is located in the heart of South Delhi. It is an ultramodern hospital with facilities for all kinds of Dialysis and Kidney Transplant.

Dialysis is a technique of removing fluid and waste products from body. In medicine, dialysis is primarily used to provide an artificial replacement for lost kidney function in people with renal failure. Dialysis may be used for those with an acute disturbance in kidney function (acute kidney injury, previously acute renal failure) or for those with progressive but chronically worsening kidney function—a state known as chronic kidney disease stage 5 (previously chronic renal failure or end-stage kidney disease).

Dialysis works on the principles of the diffusion of solutes and ultrafiltration of fluid across a semi-permeable membrane. Diffusion describes a property of substances in water. Substances in water tend to move from an area where they are in a high concentration to an area of low concentration. Blood flows by one side of a semi-permeable membrane, and a dialysate, or special dialysis fluid, flows by the opposite side. A semi permeable membrane is a thin layer of material that contains various sized holes, or pores. Smaller solutes and fluid pass through the membrane, but the membrane blocks the passage of larger substances.

Sometimes dialysis is a temporary treatment. However, when the loss of kidney function is permanent (as in end-stage kidney failure), you must continue to have dialysis on a regular basis. The only other treatment for kidney failure is a kidney transplant.

TYPES OF DIALYSIS

Haemodialysis:-

In haemodialysis, the patient's blood is pumped through the blood compartment of a dialyzer, exposing it to a partially permeable membrane. The dialyzer is composed of thousands of tiny synthetic hollow fibers. The fibre wall acts as the semipermeable membrane. Blood flows through the fibers, dialysis solution flows around the outside of the fibers, and water and wastes move between these two solutions. The cleansed blood is then returned via the circuit back to the body. Ultrafiltration occurs by increasing the hydrostatic pressure across the dialyzer membrane. This usually is done by applying a negative pressure to the dialysate compartment of the dialyzer. This pressure gradient causes water and dissolved solutes to move from blood to dialysate, and allows the removal of several liters of excess fluid during a typical 3 to 5 hour treatment.

Peritoneal dialysis

In peritoneal dialysis, a sterile solution containing glucose is run through a tube into the peritoneal cavity, the abdominal body cavity around the intestine, where the peritoneal membrane acts as a semipermeable membrane. The peritoneal membrane or peritoneum is a layer of tissue containing blood vessels that lines and surrounds the peritoneal, or abdominal, cavity and the internal abdominal organs. The dialysate is left there for a period of time to absorb waste products, and then it is drained out through the tube and discarded. This cycle or "exchange" is normally repeated 4-5 times during the day, sometimes more often overnight with an automated system. Ultrafiltration occurs via osmosis; the dialysis solution used contains a high concentration of glucose, and the resulting osmotic pressure causes fluid to move from the blood into the dialysate. As a result, more fluid is drained than was instilled. Peritoneal dialysis is less efficient than hemodialysis, but because it is carried out for a longer period of time the net effect in terms of removal of waste products and of salt and water are similar to hemodialysis.

CAPD- CAPD is a manual form of peritoneal dialysis, with no machine. During CAPD, the dialysate solution stays in the peritoneal cavity for about 4 to 6 hours. After this time, the solution is drained out of the cavity. The cavity is then refilled with fresh solution. This is the most commonly used form of peritoneal dialysis and employs 4-6 exchanges per day.

CCPD, also known as Automated Peritoneal Dialysis (APD), is a form of peritoneal dialysis using a cyclor at night. During CCPD, a machine automatically fills and drains the dialysate from the peritoneal cavity. This process takes about 10 to 12 hours; therefore CCPD is performed at night. The cyclor automatically makes 4-6 exchanges per day.

Nocturnal Intermittent Peritoneal Dialysis or IPD is much like CCPD but is usually performed in a hospital. Treatment sessions may last up to 24 hours, have an increased number of exchanges (5-8) at night and may be done several times a week. With IPD, the abdomen is drained and left "dry" (without dialysate) during the day. IPD is rarely done anymore.

Hemofiltration:-

Hemofiltration is a similar treatment to hemodialysis, but it makes use of a different principle. The blood is pumped through a dialyzer or "hemofilter" as in dialysis, but no dialysate is used. A pressure gradient is applied; as a result, water moves across the very permeable membrane rapidly, "dragging" along with it many dissolved substances, importantly ones with large molecular weights, which are cleared less well by hemodialysis. Salts and water lost from the blood during this process are replaced with a "substitution fluid" that is infused into the extracorporeal circuit during the treatment.

IMPORTANCE OF DIALYSIS

Properly functioning kidneys prevent extra water, waste, and other impurities from accumulating in your body. They also help control blood pressure and regulate the levels of chemicals in the blood, such as sodium, or salt, and potassium. They even activate a form of vitamin D that improves the absorption of calcium.

When your kidneys can't perform these functions due to disease or injury, dialysis can help keep the body running as normally as possible. Without dialysis, salts and other waste products will accumulate in the blood and poison the body. However, dialysis isn't a cure for kidney disease or other problems affecting the kidneys. Different treatments may be needed to address those concerns.

In Max Super Speciality Hospital, dialysis unit is located in first basement, East building. It is 30 bedded unit comprising two wards, our old ward is 24 bedded and new ward is having 6 beds. It consists of 35 dialysis machine, out of them 4 are portable machines.

Types of dialysis machines-

Frezinus 5008- It performs hemodiafiltration, 20lts of water is circulated with pressure for clearance as they are high flex dialyser. They are 7 in number

Frezinus 4008- It performs hemofiltration, they are low flex dialyser. They are 24 in number.

RO is considered to be the backbone of dialysis.

Review of literature

Dialysis is a medical process through which a person's blood is cleansed of the toxins the kidneys normally would flush out. It is generally used when a person's kidneys no longer function properly. This can be a result of congenital kidney disease, long-term diabetes, high blood pressure or other conditions.

Dialysis may be either temporary or permanent, depending on the person. If a patient is waiting on a kidney transplant, the procedure may be temporary. However, if the patient is not a good transplant candidate, or a transplant would not alleviate the condition, dialysis may be a life-long routine

Insertion of the needles causes pain, but only for a brief time. This can be difficult for some people. Occasionally nausea, muscle cramps or dizziness can occur due to the fast removal of extra water from your body, which may cause your blood pressure to drop.

Each hemodialysis treatment normally takes four to five hours, and usually three treatments a week are needed. More frequent, shorter treatments or longer treatments may be indicated for certain patients. Only a small amount of your blood is out of the body at one time. Therefore your blood must circulate through the machine many times before it is cleaned

Stages of chronic kidney disease

The National Kidney Foundation's (NKF) guidelines have divided chronic kidney disease (CKD) into five stages based on glomerular filtration rate (GFR), roughly the measure of your percent kidney function:

STAGES OF CKD	GFR (mL/min)	Action to take
1	≥ 90	• Diagnose and treat the kidney problem • Treat other illnesses • Slow the rate of CKD • Reduce your risk of heart disease
2	60-89	Estimate the rate at which your CKD is progressing
3	30-59	Evaluate and treat any

		complications
4	15-29	Prepare for transplant or dialysis
5	< 15	Start dialysis or get a transplant (if uremia is present) New evidence says dialysis should start by a GFR of 6, or sooner if there are symptoms

Pre-dialysis

1. Before or around the time the patient arrives for his/her scheduled session, a dialysis machine will be prepared. There are many models of dialysis machines, but typically in modern machines there will be a computer, CRT, a pump, and facility for disposable tubing and filters. The filters (the actual artificial kidneys) are cylindrical, clear plastic outside with the filter material visible inside (looks like thick paper). They are perhaps 15-18 inches long, and 2-3 inches thick. They have tubing connectors at both ends. The technician or nurse will set up plumbing on the machine in a moderately complex pattern that has been worked out to move blood through the filter, allow for saline drip (or not), allow for various other medications/chemicals to be administered. How the plumbing is set up may vary between models of machine and the types of filters. For some filters, it is necessary to clear sterilizing fluid from the filter before connecting the patient. This is done by altering the plumbing to push saline through the filter, and carefully checked with a type of litmus test.

2. The pump does not directly contact the blood or fluid in the plumbing — it works by applying pressure to the tubing, then moving that pressure point around. Think of a disk with a protrusion in it. Put this into a close fitting 270 degree enclosure. Put plastic tubing between the enclosure and the disk, entering and exiting in the 90 open degrees. Now imagine the disk turning. It will put pressure on the tubing, and the pressure point will roll around through the 270 degrees, forcing the fluid to move. It is characteristic of dialysis machines that most of the blood out of the patient's body at any given time is visible. This facilitates troubleshooting, particularly detection of clotting.

3. The patient arrives and is carefully weighed. Standing and sitting blood pressures are taken. Temperature is taken.

4. Access is set up. For patients with a fistula (a surgical modification to an arm or leg vein to make it more robust, and therefore usable for high capacity blood movement required by dialysis) this means inserting two large gauge needles into the fistula. This is painful for the patient but there are various methods of numbing the entry sites before the needles are inserted — the two most common are

lignocaine (lidocaine), a local anaesthetic injected under the skin, and there is also a cream called EMLA which is applied to the skin 45 minutes before the needles are inserted. Fistulas are widely considered the desirable way to get access for hemodialysis, but they take time to set up and mature (anywhere between 5 weeks to 15 weeks). For other patients, access may be via a catheter installed to connect to large veins in the chest. Other arrangements can be made as well.

5. When access has been set up, the patient is then connected to the preconfigured plumbing, creating a complete loop through the pump and filter.

Dialysis

1. The pump and a timer are started. Hemodialysis is underway.

2. Periodically (every half-hour, nominally) blood pressure is taken. As a practical matter, fluid is also removed during dialysis. Most dialysis patients are on moderate to severe fluid restrictive diets (in addition to other dietary restrictions), since kidney failure usually includes an inability to properly regulate fluid levels in the body. A session of hemodialysis may typically remove 2-5 kilograms (5-10 pounds) of fluid from the patient. The amount of fluid to be removed is set by the dialysis nurse according to the patient's "estimated dry weight." This is a weight that the care staff believes represents what the patient should weigh without fluid built up because of kidney failure. Removing this much fluid can cause or exacerbate low blood pressure. Monitoring is intended to detect this before it becomes too severe. Low blood pressure can cause cramping, lose consciousness. Often this is temporary and passes after the head is placed down (Trendelenburg position) for a short time.

Post-dialysis

1. At the end of the prescribed time, the patient is disconnected from the plumbing - blood lines (which is removed and discarded, except perhaps for the filter, which may be sterilized and reused for the same patient at a later date). Needle wounds (in case of fistula) are bandaged with gauze, held for 10 to 15 minutes with direct pressure to stop bleeding, and then taped in place. The process is similar to getting blood drawn, only it is lengthier, and more fluid or blood is lost.

2. Temperature, standing and sitting blood pressure, and weight are all measured again. Temperature changes may indicate infection. Weighing is to confirm the removal of the desired amount of fluid.

3. Care staff verifies that the patient is in condition suitable for leaving. The patient must be able to stand (if previously able), maintain a reasonable blood pressure, and be coherent (if normally coherent).

Post-dialysis washout

Following hemodialysis, patients may experience a syndrome called "washout". The patient feels weak, tremulous, extreme fatigue. Patients report they "are too tired, too weak to converse, hold a book or even a newspaper." It may also vary in intensity ranging from whole body aching, stiffness in joints and other flu-like symptoms including headaches, nausea and loss of appetite. The syndrome may begin toward the end of treatment or minutes following the treatment. It may last 30 minutes or 12-14 hours in a dissipating form. Patients though exhausted have difficulty falling asleep. Eating a light meal, rest and quiet help the patient cope with washout until it has 'worn away.'

Hemodialysis is a process where a small amount of blood (just over a cup) is removed from the body and sent through an artificial kidney. The artificial kidney has a cellophane-like membrane and is bathed in a solution called dialysate. The blood is cleansed of waste products and excess fluid. The blood is then returned to the patient. Dialysis is not only the removal of fluid but also the removal of waste. This includes electrolytes, especially potassium which, in excess, can cause cardiac arrhythmias. Hemodialysis is usually performed three times a week, for three to five hours.

Staff assists patient into the unit at scheduled time, where patient will be weighed on the scale while standing, in wheelchair or in the Hoyer lift. This weight determines how much fluid patient has gained since his last treatment.

Patient will be brought to his seat for treatment and nurse will verify his identity by confirming his name and date of birth at every treatment. Once in his bed, a nurse will take his temperature, blood pressure and heart rate, and will examine him for signs of fluid overload, such as edema or shortness of breath. He or she will listen to heart and lungs, and look at vascular access for any signs or symptoms of infection or malfunction. This is the time for patient to tell nurse of any problems or complications he may be having or if he had a change in medications. It is recommended that he carry an updated list of medications with him at all times.

The nurse will set his machine according to doctor's orders. Nurse will prepare vascular access by cleaning fistula or dialysis catheter. This prevents bacteria from entering bloodstream and causing a possible infection. If using a fistula, the nurse will insert two needles into it. The purpose of the vascular access is to have a way to remove blood from body and return it in high volumes.

Once dialysis access and the dialysis machine are ready, the nurse will then "connect" to the machine using two lines. Labs that need to be drawn are taken before the connection to the machine is made. The access line pulls the "dirty" blood from body, and the venous, or return line, pushes the "clean" blood back into body. Approximately half a pint of blood is removed and returned to your body per minute.

While on the dialysis machine, blood is continually being pulled from body and traveling through the dialyzer (filter), which removes toxins and extra fluid. This is done by the processes of diffusion, osmosis

and ultrafiltration. The blood is then returned to body. To prevent blood from clotting in the dialyzer or blood tubings, heparin is given during treatment.

Patient is closely monitored by nursing staff throughout treatment. Patient can expect to have blood pressure taken every 30 minutes to make sure it is not too high or too low. While receiving treatment, he may hear machine alarms. These alarms alert the staff of any potential problems and are quickly responded to and resolved.

Remain in a reclined position with your feet elevated while receiving treatment. This prevents blood pressure from falling too low. If he have needles in place, please hold that part of your body still to prevent a needle from being dislodged. If at any time you do not feel well, please alert the staff. This includes nausea, muscle cramps and dizziness. Report any pain using the zero to 10 Pain Scale as a measurement.

During each month of dialysis, expect to have blood work drawn, your feet and/or stumps checked for vascular problems and a monthly education topic presented to you. You will also be asked about your medications to make sure your medication list is up to date.

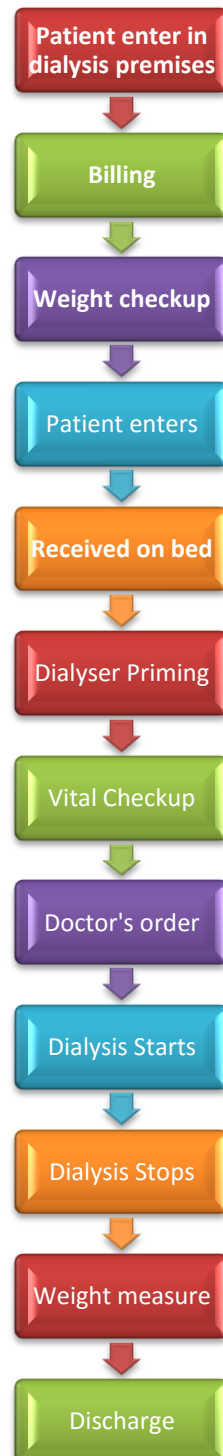
Once your treatment is completed, your blood will be returned to your body. Any post treatment lab work will be drawn before needles are removed or dialysis catheter is closed. If you are a patient holding your needle sites after they are removed, for infection control purposes, he will need to wear a glove.

Vitals will be taken again before patient go home (this includes blood pressure, heart rate, temperature and weight). Be sure to rest a few minutes before getting out of your chair if you feel lightheaded or weak.

Every patient, before leaving the unit, must wash their hands, or use the hand sanitizer or hand wipes provided by nurse. This is for protection and for others.

Dialysis unit at Max Saket works under five shifts- 7 AM, 12AM, 5PM, 9PM, 2AM. My study is mainly focused on afternoon and evening shift.

PROCESS FLOW



RATIONALE

This report is indented to find out the various deviations from standard protocol encountered in Dialysis unit in Max Super Speciality Hospital, Saket as Dialysis Unit is one of the major units that adds to the cost of patients and major cause of mortality and mortality in patients leading to increase in average length of stay and adds to cost in maintenance for the hospital as well. Reducing the deviations in Dialysis Unit can lead to increase in significantly enhancing the hospital's image.

Establishing a standard protocol procedure for controlling the deviations in Dialysis Unit will help in promoting efficiency amongst the employees and helps in establishing a significant position of the hospital amongst competitors.

OBJECTIVES

1. To observe and analyze the various deviations from standard protocols in Dialysis Unit at Max Super Specialty Hospital, Saket.
2. To search for areas of problem and find reasons for the same.
3. To give recommendations for further improvement in protocols followed in dialysis unit and enhance patient satisfaction.

METHODOLOGY

- **Type of study** : Descriptive cross-sectional
- **Study population** : Doctors, Nurses, technicians IN DIALYSIS UNIT at Max Super Speciality Hospital, Saket, Delhi
- **Study area** – DIALYSIS UNIT at Max Hospital, East wing, Saket, Delhi
- **Duration of Study**- 3 weeks
- **Type of Data** – Quantitative
- **Technique** – Direct Observation of Dialysis process
- **Sample size** - 100
- **Sampling technique**- Convenient sampling

- **Inclusion criteria-**
 - Doctors, Nurses & technicians practising in DIALYSIS Unit at Max Hospital, East wing, Saket.
 - Standard Protocols Followed by Doctors and Nurses at Max Saket Hospital.
- **Exclusion criteria-**
 - Doctors and Nurses working in rest area of the Hospital.
- **Data collection** - Primary and Quantitative (3 weeks)
- **Data entry-** Manually
- **Data Analysis-** Using bar charts, pie, line diagram

GENERAL OBSERVATION AND FINDINGS OF DIALYSIS DEPARTMENT-

- Charges for dialysis vary according to dialysis machine, ferzenius 5008 costs more than ferzenius 4008.
- 90% of dialysis patient undergo treatment thrice a week.
- In 96% cases the dialyzer is replaced after 14 treatments or less.
- Serology test is done once in three months.
- In 92% cases patient come with the attendant who stay in the hospital during dialysis.
- The most convenient time for the patient to receive dialysis is 12PM and 5 PM shifts.
- 90% of patients complaint of wheelchair facility.
- 60% of patients attendants complaints of sitting arrangements besides their patient.
- The principal areas of research have been in the development of products which improve the safety and efficiency of dialysis, Including synthetic dialysis membranes and new delivery systems
- One doctor is always on duty in Dialysis Unit
- One dietician always present in dialysis unit who take care of diet of patients undergoing dialysis procedure.

Predialysis safety checks:

- Before beginning the Dialysis procedure Technicians always ensure proper functioning of water system by performing following checks: Hardness of post softener water, chlorine and chloramines checks of post carbon filter water, permeate flow and pressure, reject flow and pressure, conductivity or resistivity reading and gauge reading of filtration devices.
- Check for absence of chemical in dialysate effluent line if chemical is used to disinfect machine.
- Ensure proper functioning of dialysis machine by checking alarms. Always perform self-test if this facility is available.
- Ensure proper conductivity, temperature and pH of dialysate.

Setting Machine Parameters-

- Ensure alarm limits are set.
- Ensure proper fluid parameters are set.
- Ensure proper blood flow is set.
- Ensure proper bolus dose of anticoagulant is given and proper anticoagulant rate is set.
- Ensure proper dialysate temperature is set.
- Ensure proper dialysate flow rate is set.
- Do not bypass or override any alarm during dialysis treatment.
- Change external pressure transducer protector between patients.

Post dialysis care of machine:

- Perform water rinse after each treatment session.
- Use chemical recommended by manufacturer to clean and decalcify fluid path of dialysis machine.
- Decalcification can be performed by using chemical rinse with acetic acid or citric acid. This can be carried out at the end of the day.

- Disinfection of fluid path can be performed by using chemical rinse with formaldehyde, sodium hypochlorite or paracetic acid.
- Sodium hypochlorite is useful in biofilm control. 1:100 dilution of bleach (300-600 PPM free Chlorine) can be used to disinfect fluid path of dialysis machine. Chemical is usually rinsed out from the system after relatively short exposure time of 30min or less.
- Formaldehyde in concentration of 1-2% is used to disinfect fluid path of dialysis machine. Formaldehyde can remain in system for a long period. Usually formaldehyde is kept overnight to ensure proper disinfection of fluid path.
- If chemical is used to clean or disinfect fluid path adequate water rinse must be performed and absence of residual chemical in effluent must be confirmed.
- While performing heat disinfection, treated water is heated to 85-95 C and recirculated for specified time.

Protocol for putting a patient on dialysis:

Step 1

Dialysis machine

Dialysis equipment preparation and alarm testing (according to manufacturer's instruction) should be done to prevent complications on Dialysis.

Step 2

Dialyser : Priming of dialyser should be done immediately prior to treatment

1st use: All air must be expelled from the dialyser to prevent foam in the circuit after initiation of dialysis

Reuse Dialyser: All chemical sterilizers should be removed and dialyser priming done with adequate amount of normal saline.

Once primed, machine can be put into recirculation mode until the patient is ready.

Step 3

Programming of machine according to patient treatment plan decided by nephrologist:

- About the desired fluid loss
- Treatment duration
- Heparin dose
- Blood and dialysate fluid flow rate
- Choice of concentrate
- Type of dialyser

Step 4

Patient assessment: this is the most important factor in the prevention of complications during dialysis treatment and it should be performed before each dialysis session.

a).Pre dialysis assessment includes weight, BP, pulse, temperature and assessing fluid status.

Nurse check following parameters:

- Weight gain
- Oedema
- Breathlessness
- Hypertension
- Urine output

b). Access assessment and preparation with antibacterial agents(Betadine solution and spirit) should be done thoroughly

Step 5

During Dialysis

Patient should be monitored. Frequency depends on the stability of the patient. Following parameters should be recorded during the dialysis treatment :

- General condition
- Blood pressure

- Pulse
- Venous and arterial pressure
- Ultrafiltration rate
- Heparin dose delivered,if needed

Universal precautions should be adhered to at all times within the dialysis unit. Whenever clinical procedure is performed , hands should be washed, clean gloves and face protection devices used.

Step 6

Termination of dialysis treatment

- After the completion of dialysis, machine gives an audible or visual indication that the procedure hours of treatment have been achieved
- Blood in the tubing and dialyser is returned back to the patient, by using 200-300 ml of saline at a blood pump speed of 150ml/min.
- Air should not be used to return blood to the patient to avoid the risk of Air Embolism.
- For AV fistula or AV graft: after completion of blood return, blood pump should be removed needles should be removed and pressure should be applied over the venepuncture. Once bleeding has stopped, the puncture site should be covered with gauze or a dressing done which will stay for 4-6 hrs.

Step 7

Post Dialysis Assessment

Post dialysis: Patient should be assessed for blood pressure, weight and overall physical condition by dialysis nurse.

Post dialysis weight is compared with predialysis weight and dry weight, to ensure programmed weight loss. Nurse should also check how well the patient has tolerated the fluid removal

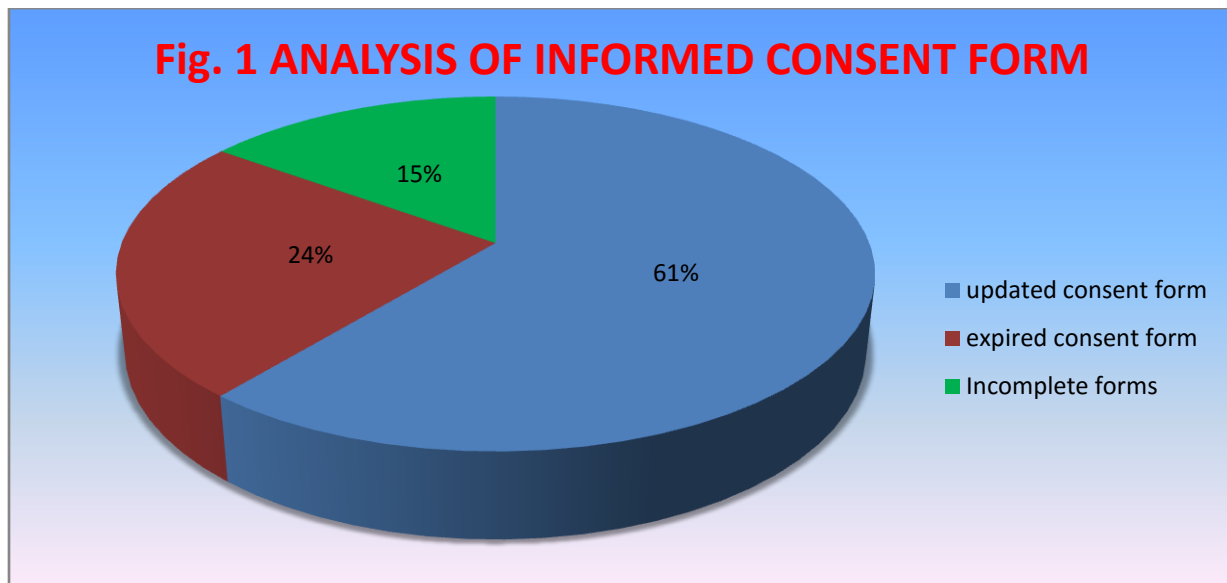
Discrepancy between desired and achieved weight loss can be caused by-

- Incorrect calculation of weight loss

- Faulty ultrafiltration control
- Patient consuming extra fluid during dialysis
- Intravenous fluid administered during dialysis

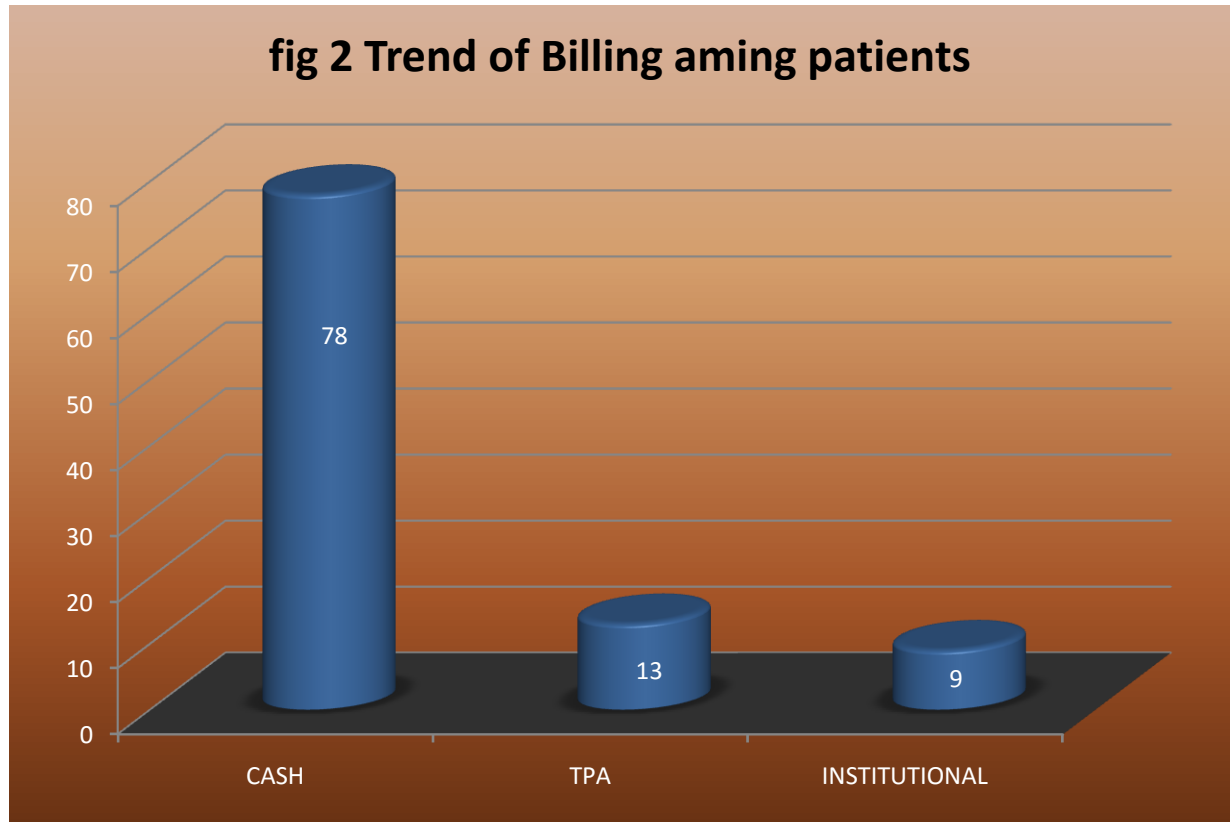
DATA ANALYSIS

Analysis of Informed Consent form



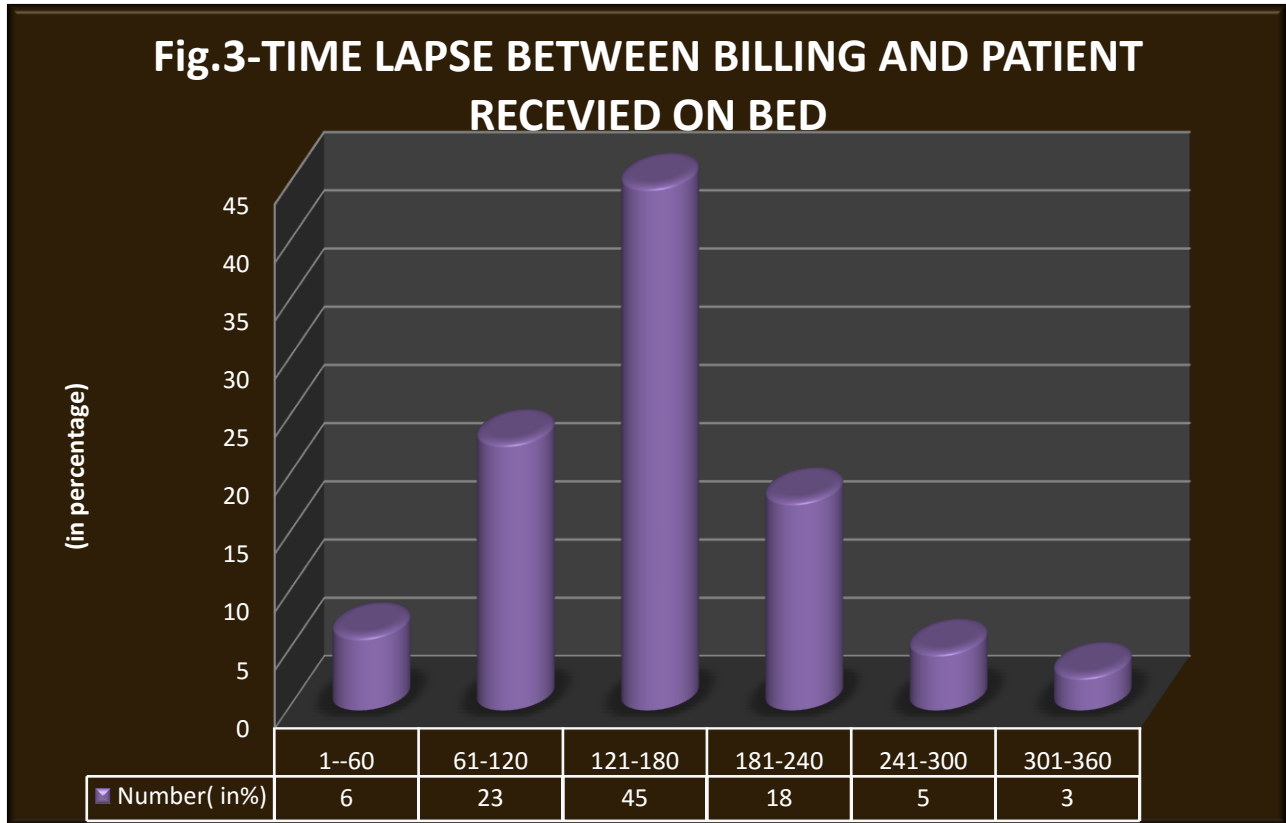
INTERPRETATION:- As per the analysis, out of 100 samples I have taken 61% of them have updated consent form, 24% consent form was expired and 15% consent forms was incomplete, most of them was not signed by doctors and if signed date was not mentioned.

ANALYSIS OF TREND OF BILLING AMONG PATIENTS



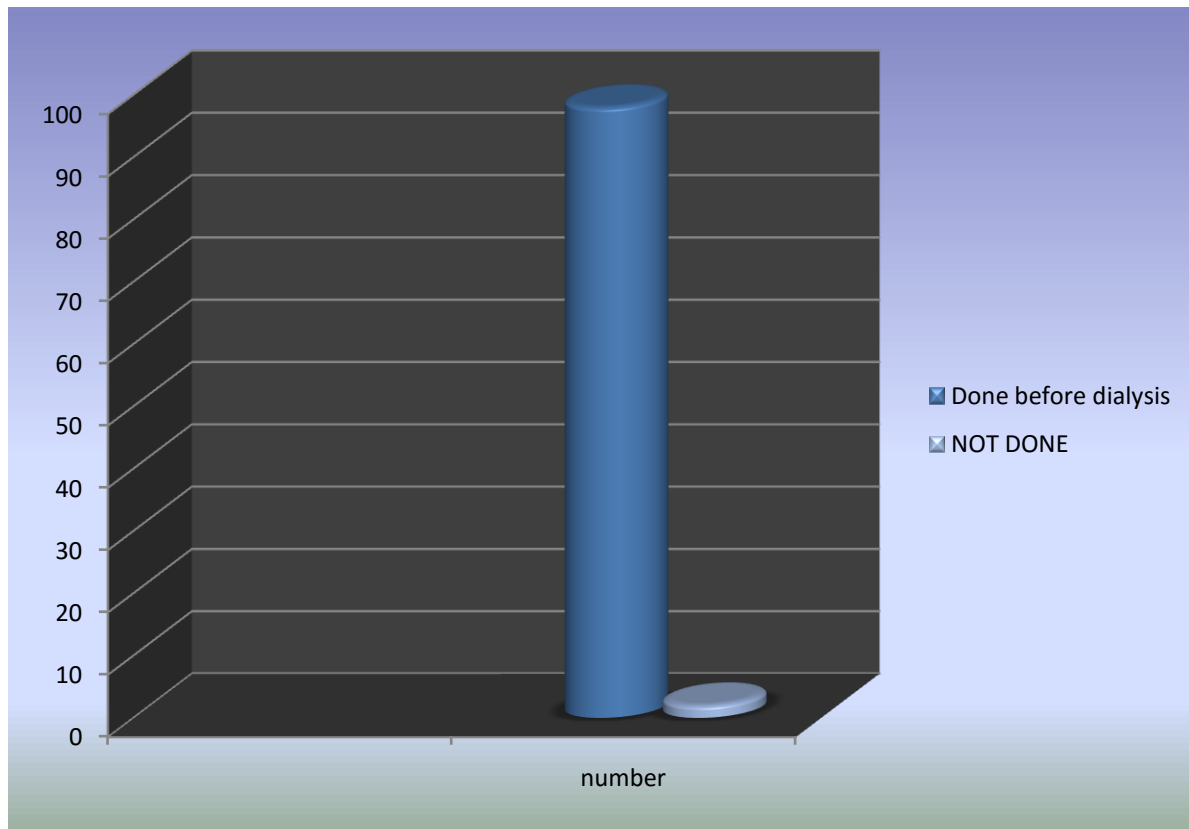
INTERPRETATION-As per my analysis, out of 100 samples I have taken 9% was institutional, 13% was TPA , and 78% patients was cash patients which was maximum.

ANALYSIS OF TIME LAPSE BETWEEN BILLING AND PATIENT RECEIVED
ON BED



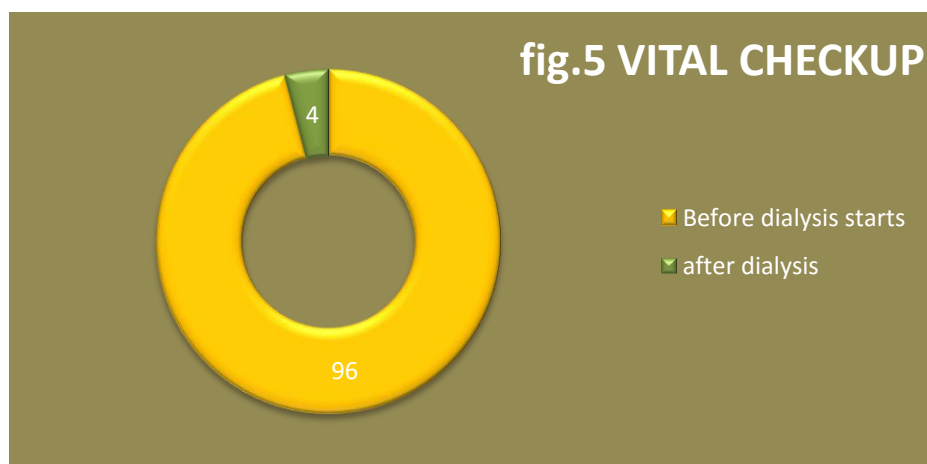
INTERPRETATION:-As per my analysis, out of 78 cash patients I observed 45% of cash patients shows highest time lapse which lies in the range of 121-180 min. 3% of cash patients show time lapse of 301-360 min.

ANALYSIS OF AWARENESS FOR WEIGHT CHECKUP **AMONG DIALYSIS PATIENT (BEFORE DIALYSIS)**



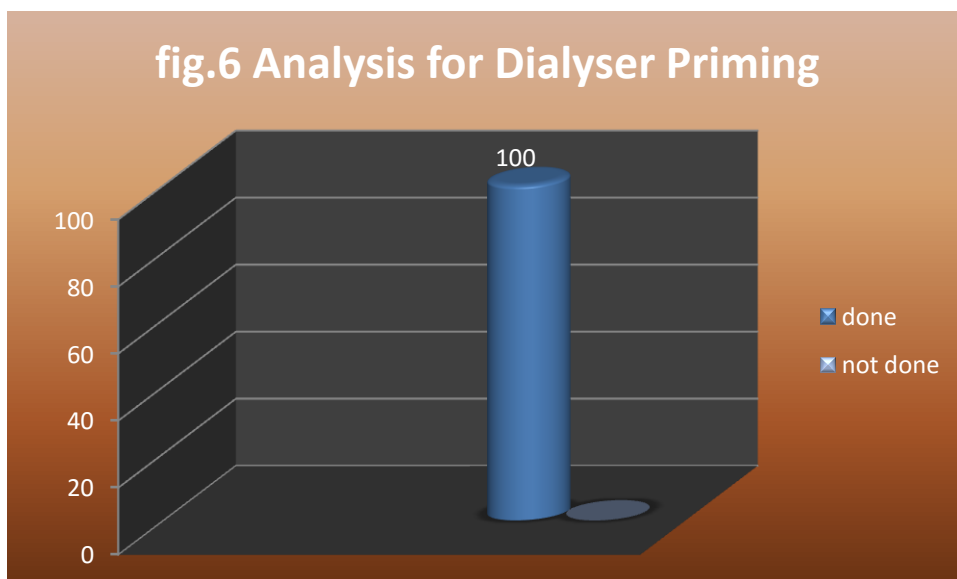
INTERPRETATION-The figure reveals that, 98% of patients followed the standard protocol of weight measure before dialysis.

VITAL CHECKUP



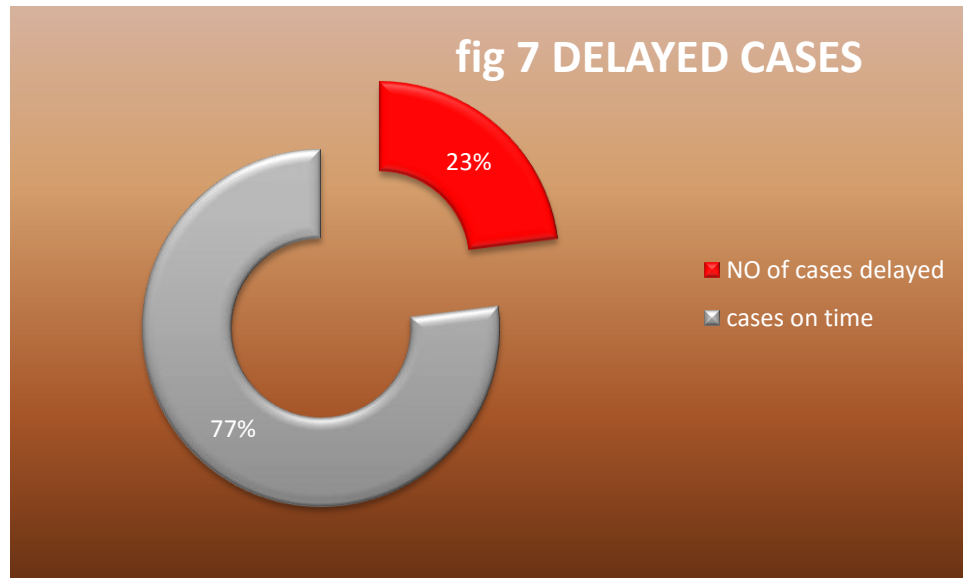
INTERPRETATION-The fig clearly shows that almost all the technicians perform vital checkup before dialysis.

AWARENESS AMONG TECNICIANS REGARDING DIALYSER PRIMING



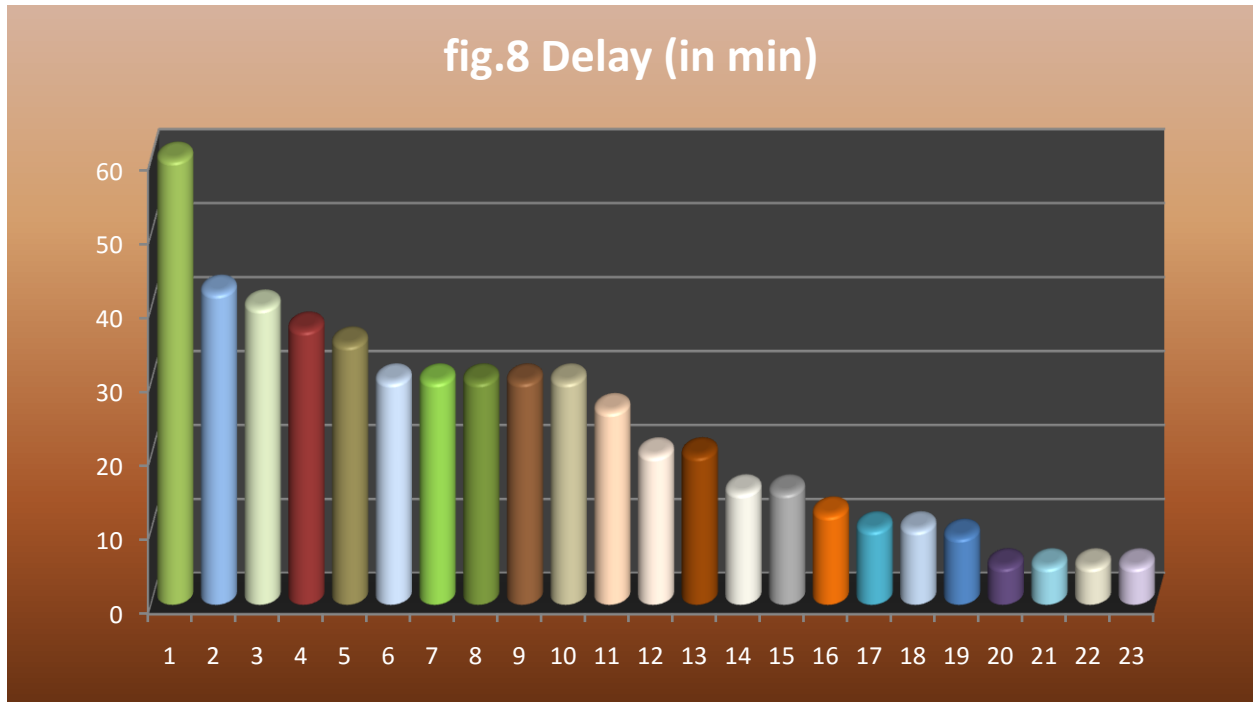
ANALYSIS OF DELAY BETWEEN APPOINTMENT TIME TO DISCHARGE

NUMBER OF CASES DELAYED



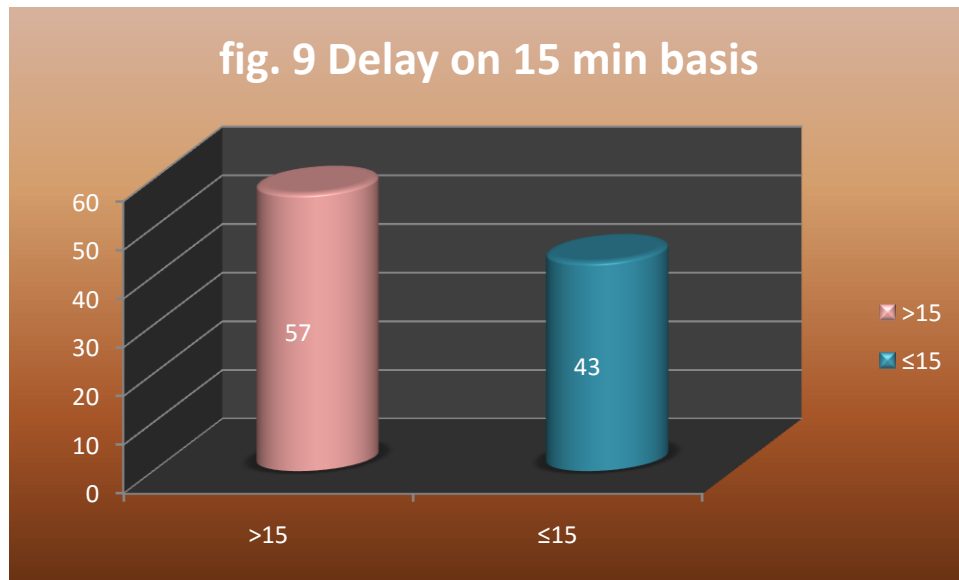
INTERPRETATION- This fig depicts that 77% of cases were on time and 23% of cases were delayed. (4 hrs 30min.....)

TREND AMONG DELAYED CASES



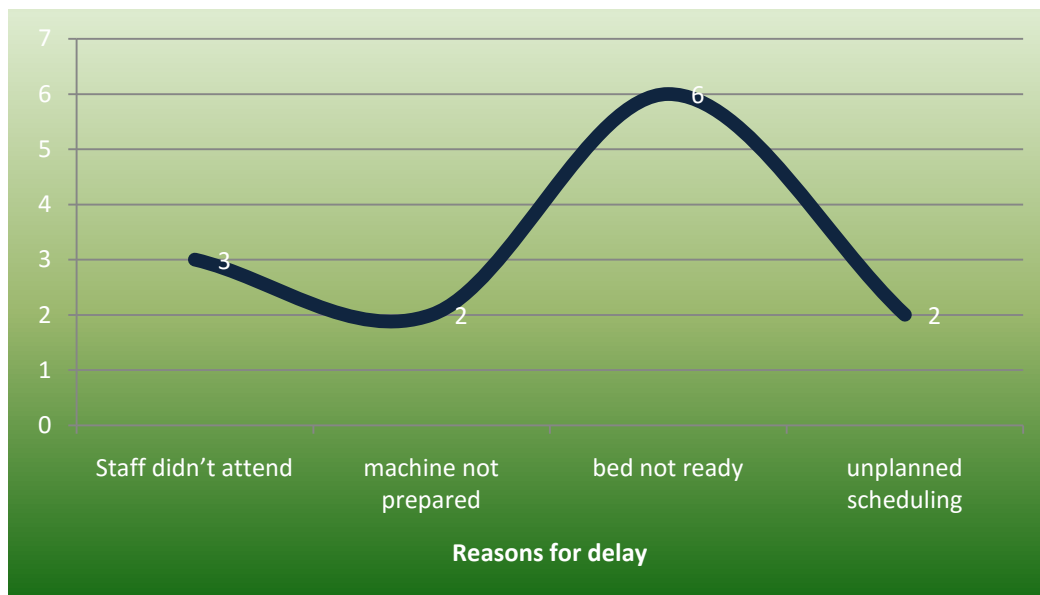
INTERPRETATION-This fig clearly depicts that among 23 delayed cases observed maximum delay is of 60 min.

ANALYSIS OF DELAY ON 15min BASIS



INTERPRETATION-As per analysis, out of 23 delayed cases observed, 57% of them shows delay of more than 15 min and 43% of them shows delay of less than or equal to 15 min

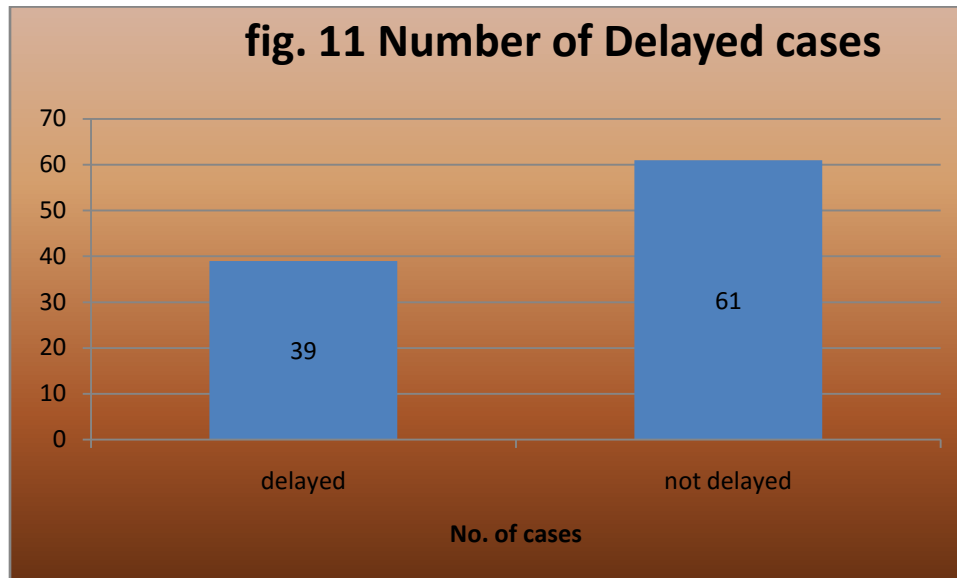
Fig. 10 REASONS FOR DELAY OF MORE THAN 15 MIN



INTERPRETATION-The fig shows out of 13 delayed cases of more than 15 min, 6 (46%) of them were delayed because bed was not ready 3 (24%) was delayed because staff was busy, 2 (15%) of them was delayed because machine was not ready and unplanned scheduling,

DELAY BETWEEN APPOINTMENT TIME AND PATIENT RECEIVED ON BED

NUMBER OF DELAYED CASES



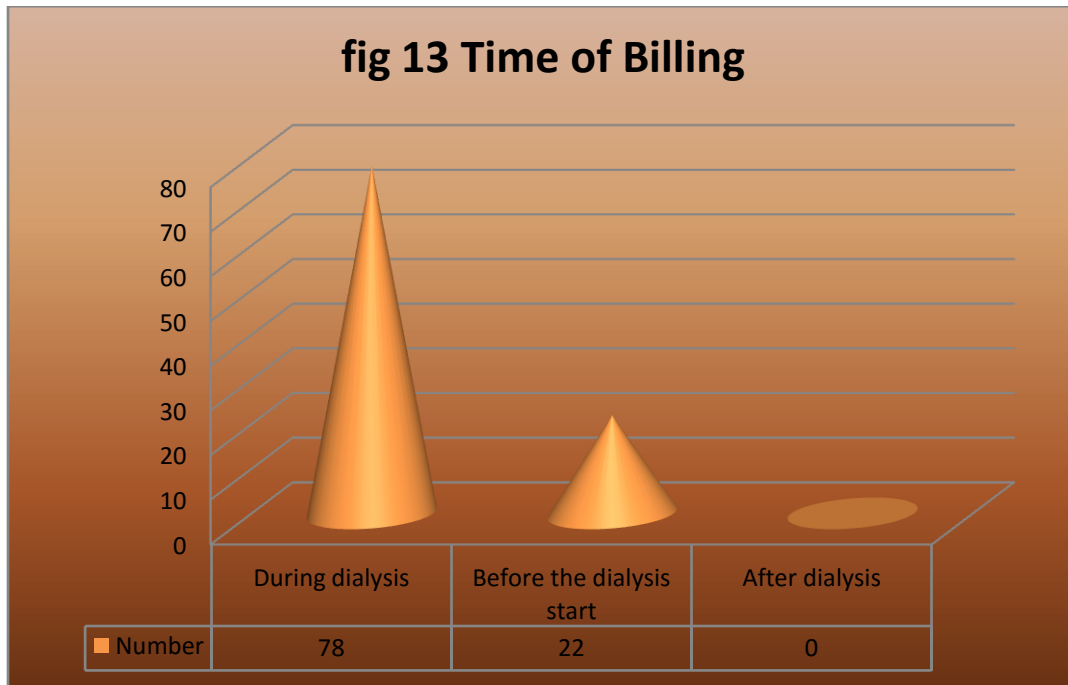
INTERPRETATION- As per analysis out of 100 cases observed 61% was not delayed and 39% was delayed.

DELAY ON 15 MIN BASIS



INTERPRETATION-The fig shows 57% of case face delay of less than or equal to 15 min and 43% of cases face delay of more than 15 min

ASSESSMENT OF TIME OF BILLING



INTERPRETATION-The fig depicts 78% of cases pay their bills during dialysis procedure while 22% of cases pay their bills before dialysis procedure and none of them leave the dialysis premises without paying bill under my observation.

INTERPRETATION-

Study shows that technicians in the Dialysis Unit are well aware of the standard protocols which should be followed in unit but some of them fails to remember that vitals must be recorded before dialysis process starts.

All nurses and technicians are aware of importance of hygiene in Dialysis Unit. Informed consent is not given much importance majority of informed consent form were expired which was rectified by me during my study period. Study also shows that patients are well aware of the fact that weight checkup is essential before process of dialysis also technicians and nurses take good care of this thing and always ensure that patient not leave Dialysis premises without getting their weight checkup done.

Study also shows that there is general tendency among patients to pay their bills after 2hrs since procedure is started. Most of them give reason of paying their bills late is so that if any extra injection is required it can be added to the bill.

SUGGESTIONS AND RECOMMENDATIONS

- There should be nice facility for attendants so that they can sit and relax as dialysis procedure take 4 hrs and in some cases even more than that.
- Counseling should be done by an expert or nursing staff about various issues of dialysis like how to better take care of yourself; dialysis friendly recipes, etc.
- As dialysis is a costly treatment so it is not possible for dialysis patients to afford the treatment for a longer time especially those who belong to the middle class or lower class families. such type of patient need some help in monetary terms so that hospital should increase their contacts with the trusts such as Sai baba dialysis help centre, Bharat vikasparishad etc. Such type of organizations not only provides help to the patient but helps hospital in attracting new patients and retaining them for a longer time.
- There must be assistant dialysis coordinator who can work under Programme manager for smooth flow of process in dialysis unit.
- Pickup and Drop-off services can be started by the hospital for the dialysis patient according to survey results
- There should be nice facilities for attendants in waiting area.

CONCLUSION

Over the coming years, more and more people will have a renal condition in India. However, both the amount and choice of dialysis services in India is limited. For instance, at present, no Service providers appear to offer home haemodialysis, despite national guidance that says it should be offered.

We are pleased that many of these problems are being addressed and that renal services are now a priority in India. It is clear that the effect of dialysis on a person's whole life and that of their family is not widely understood. We hope this review will bring about changes in provision and support which will help them.

Patient treatment sheet-

[illegible]

Annexure 2:



Dialysis.xlsx



HOSPITAL FIRE SAFETY AND EVACUATION PLAN

AT

MAX SUPERSPECIALITY HOSPITAL, SAKET



Institute of Health Management Research, Jaipur

DECLARATION

I do hereby declare that I am a student of 1st year, MBA in Hospital and Healthcare Management, IIHMR University, Jaipur, Rajasthan session 2015-2017.

I would like to state that I have made the “Hospital fire safety and Evacuation Plan” under the guidance of Dr.Neha Chandra (Deputy Medical Superintendent) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfilment for the degree of MBA in Hospital and Healthcare Administration.

This project work is my own and has not been submitted to any of the other Institute or University for the purpose of award of any degree or diploma.

Dr. Priyanka Maini

IIHMR University

(2015-2017)

ACKNOWLEDGMENT

I take this opportunity to express my profound sense of gratitude and indebtedness to all those who helped me throughout the duration of the project.

I would like to acknowledge, First and foremost Dr. Neha Chandra (Assistant General Manager-Medical Quality), for showing confidence in me and giving me such a wonderful topic to do my project & Dr. Sahar Qureshi, without her support and guidance it would not have been possible. Also I would like to thank Dr. Tanya Vaish (Medical Quality) whose support was very essential in the completion of my project. Then I would like to thank my mentor at Max Hospital, Saket Dr. Sandeep Mor, for his guidance throughout my internship period. I would also like to thank Mr. Deepak Fansal & Mr. Arjun Singh Rawat for his guidance, motivation and encouragement throughout the completion of Project. Also, I would like to express my gratitude to Dr. Ashish Tripathi (Assistant Manager- Medical Administration) as he has been a Great source knowledge, information and inspiration to do work with utmost diligence and sincerity.

I would also like to thank Dr. Nalini Kaul (Medical Superintendent) without whose permission I would not get this golden opportunity to do my internship in this esteemed hospital.

I would also like to thank my faculty at IIHMR-Jaipur and specially my Mentor- Dr. Suresh Joshi (Professor) and also feel privileged to acknowledge, Ms. Bhavya Arora for being my support all through the internship.

I would also whole heartedly thank the entire staff at Max, Saket for being so supportive and helpful and taking out some time from their hectic schedules and giving all the required information, especially Security And Engineering Department.

At the end, I am thankful to God and my heartfelt gratitude to my parents and friends who supported me throughout the course.

THANK YOU ALL
Dr. Priyanka Maini
IIHMR
(2015-2017)

INTERNSHIP CERTIFICATE FROM MAX SAKET

This is to certify that Dr Priyanka Maini, a student of IHMR-Jaipur PGDHM-20 has carried out a project on "*Hospital Fire safety and Evacuation Plan, Max Saket*"

This project work has been prepared by the student herself with utmost sincerity and this work has not been presented earlier for any academic activity.

I wish her all the very best & success in her further future endeavours.

Dr. Neha Chandra
Assistant General Manager (Medical Quality)

Dr. Sandeep Mor
Deputy Medical Superintendent

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Abbreviations

S.No.	Abbreviation	Meaning
1	U/G	Underground
2	CPR	Cardio Pulmonary Resuscitation
3	IRT/ ERT	Initial Response Team/ Emergency Response Team
4	SCR	Security Control Room
5	GDA	General duty
6	F & B	Food and beverages
7	PPE	Personal Protection Equipment
8	BME	Biomedical Engineering
9	CMO	Chief Medical Officer

TOPIC : Hospital Fire safety and Evacuation Plan, Max Saket

PURPOSE : To Evacuate the staff and patients safely from the hospital in the incidence of Fire

INTRODUCTION TO FIRE SAFETY

If a fire should occur in the hospital, we cannot evacuate like most other types of businesses.

Many of our patients are non-ambulatory to varying degrees and many are on life support systems. Therefore we must be prepared to fight, control, and contain the fire while the building is occupied. The responsibility of initial containment and control of fire rests with hospital personnel. It is imperative that every employee be familiar with the hospital's fire plan and knows the appropriate action to take if a fire should occur. Your actions in a fire emergency could be the difference between a minor incident or a tragic event.

All healthcare facilities shall be so designed, constructed, maintained and operated as to minimize the possibility of a Fire emergency requiring the evacuation of occupants, as safety of hospital occupants cannot be assured adequately by depending on evacuation alone. Hence measures shall be taken to limit the development and spread of a fire by providing appropriate arrangements within the hospital through adequate staffing & careful development of operative and maintenance procedures consisting of:

- 1) Design and Construction
- 2) Provision of Detection, Alarm and Extinguishment
- 3) Fire Prevention
- 4) Planning and Training programs for Isolation of Fire
- 5) Transfer of occupants to a place of comparative safety or evacuation of the occupants to achieve ultimate safety

In case of fire, below four (4) steps procedure follows:

- 1. Rescue :** escort or carry anyone in immediate danger of fire or smoke to a place of safety
- 2. Sound the alarm:**
 - a. Go to the nearest red fire alarm pull station and activate the alarm by pulling down the handle
- 3. Confine the fire:** Disconnect medical gas flowmeters in the room and close all doors in the fire area as you leave the room. This will contain the fire and smoke in the fire area and give you time to evacuate patients in your wing to an area of safety.
- 4. Extinguish / evacuate:** If the fire is small attempt to extinguish the fire with a fire extinguish. If necessary, begin evacuation of the area.

EXPECTED LEVELS OF FIRE SAFETY IN HOSPITALS

Hospitals shall have provision for two levels of safety within their premises:

- 1. Comparative Safety:** It is the protection against heat and smoke within the hospital premises, where removal of the occupants outside the premises is not feasible and/or possible. Comparative Safety can be achieved through the following:
 - Compartmentation
 - Fire Resistant wall integrated in the Flooring
 - Fire Resistant Door of approved rating
 - Pressurized Lobby, Corridor, Staircase
 - Pressurized Shaft (All vertical openings)
 - Refuge Area
 - Independent Ventilation system
 - Fire Dampers
 - Automatic Sprinkler System
 - Automatic Detection System
 - Manual Call Point
 - First Aid
 - Fire Fighting Appliances
 - Fire Alarm System
- 2. Ultimate Safety:** It is the complete removal of the occupants from the affected area to an assembly point outside the hospital building. Ultimate Safety may be achieved through:
 - Compartmentation
 - Fire Resistant Door of approved rating
 - Protected Lobby, Corridor, Staircase and Shaft
 - Public Address System
 - Signage

- Fire Drills and orders

Need of Emergency Evacuation

The Hospital Emergency Evacuation Plan is intended to provide instructions, protocols and procedures that should be followed in case of any Emergency situation necessitating either a Horizontal (lateral), Vertical, Full or Partial evacuation of the hospital.

The term "**Emergency Evacuation**" shall mean removal of patients, personnel, and visitors to areas deemed safer for as long as it may be necessary to decide further action.

The evacuation plan has been framed to ensure safe evacuation of its occupants in an orderly and systematic way.

It is important to formulate the plan in advance and simultaneously ensure that all employees are informed regarding the same-

- To prevent fatalities and injuries
- To reduce damage to buildings and contents
- To accelerate the resumption of normal operations
- Because the fire code requires it

It requires designating participants with defined duty, and then carries out drills to test and demonstrate the working efficacy of the plan. The evacuation can be of the following types:

- **Horizontal Evacuation-** This could be because there is no danger of the fire spreading but there is sufficient smoke to cause discomfort to patients in the immediate area
- **Partial Evacuation-** This could be because there is no danger of the fire spreading but there is sufficient smoke to cause discomfort to patients in the immediate area or because it is not certain that ERT will be able to bring the fire under control without further spreading.
A partial evacuation would normally be one floor below the floor of fire or as per the demand of the situation.
- **Full Evacuation.** -Based on the fact that the fire is fully out of control full evacuation is done.

FIRE EVACUATION PLAN

To prepare for and define the roles for Evacuation and Relocation of occupants during an Emergency includes:

- Emergency egress or escape routes
- Procedures for employees:
 - Who remains to operate critical equipment before evacuating
 - To account for employees and occupants
- Identify those:
 - Responsible for rescue or medical aid
 - Who can be contacted for further information
- Identify preferred and alternative means of notifying occupants of a fire or emergency
- Preferred and any alternative means of notifying fire department or appropriate emergency organization

Staff Duties and Responsibilities

- Emergency coordinator
- Chain of command
- Alternative communication center
- Address who will assist disabled workers
- A system for accounting for personnel and non-personnel following an evacuation
- Identify who is trained and willing to deal with casualties

Purpose of Fire Drills

- To be ready should an occurrence happen, increasing the chances of survival. A disorganized evacuation can lead to confusion, injury, death and property damage.
- **In case of fire, think “RACE”:**
 - Rescue all persons in immediate area
 - Alarm: announce the fire- Pull alarm and dial 14
 - Confine the fire by closing doors
 - Evacuate/Extinguish

STAFF TRAINING

TYPES OF FIRE EXTINGUISHER:-

- Water CO2 type
- Foam type
- Powder type(Dry chemical Fire Extinguisher)
- Clean agent gas
- Nonmagnetic type
- Kitchen type
- Fire Extinguisher Training
 - Decision
 - Only use if the fire is small and contained, and not spreading beyond its starting point
 - Do not waste time in trying to fight the fire if the fire might block your only way out
 - Proper extinguisher use, think “**PASS**”:

Pull trigger pin (Stand back several feet away from fire)
Aim low, point the nozzle at the base of the fire
Squeeze trigger
Sweep from side to side until the fire appears to be out

- Medical Training
 - First aid, CPR, etc.
- Safety Equipment
 - First aid kits, hardhats, goggles, eye washing facilities, breathing apparatus, etc.
- Fire Protection Systems (Alarms and Sprinklers)
 - Train employees how your particular system works
 - Employees should be familiar with fire alarm signals
 - Smoke alarms detect smoke, sprinklers are set off by heat
 - Smoke alarms systems are early warning devices, allowing precious time to evacuate
 - Fire sprinkler systems are designed to control the fire
 - Normally one or two sprinklers will discharge, not the whole system smoke only where permitted
 - Keep equipment clean and use it properly
 - Handle flammable liquids with caution
 - Know location of emergency exits and procedures
- House Keeping Techniques-
 - Storage and work areas free from trash
 - Place oily rags in covered containers with daily disposal
 - Periodically remove over spray residue
 - Quantity of combustible materials required for work operation only

FIRE SAFETY EQUIPMENT DETAILS OF MAX SAKET

Fire Fighting System includes the following equipment's:

1. Jockey pump (elec.)
2. Main pumps (elec.)
3. Diesel engine
4. Terrace pump
5. U/G water tank
6. OH tank

Our west and east building comprises of 2 main pumps in each building. In east building, there are 2 jockey pumps whereas in west building, there is 1 jockey pump. Both east and west buildings comprise of 1 no. of diesel engine in each building.

1 terrace pump is located in east building of Max Saket but in west building there is no terrace pump. East and west building of Max Saket have U/G water tank of capacity 200KL in each building. OH tank with capacity of 20kl is located in both east and west building.

Automatic Sprinkler System-

East building of Max Saket have 1650 sprinklers and west building of Max Saket have 1228 sprinklers.

First aid fire equipment	Saket East	Saket West
Water CO2 type	37	102
CO2 type	97& 1	95
ABC type	50	18
DCP type	7	14
Mechanical foam	21	6
Clean agent type	13	7
Nonmagnetic type	NA	2
Sand bucket	10	8

Floor landing fire shafts-

2- Delivery hose, IFM/Axe 1-HRH and mallet-its count In Max Saket east building is 50 and west building is 61.

Yard hydrant-

In Max Saket east building yard hydrant with hose boxes are 11 in number and in west building these are 7 in number.

Fire detection system-

	East	West
Main panel	3	2
Repeater panel	3	1
Smoke detector/ heat detector	805	718
Manual call point	47	47
Talk back system	NA	28

Fire suppression system

CO2 flooding system is 2 in number in each building of Max Saket

There are 2 trace system in east building of Max Saket and no trace system in west building of Max Saket.

Emergency illumination-

Max Saket east block have 83 emergency lights and west building have 80 emergency lights.



P.A. System

Max Saket has 1 voice evacuation system in east building and 1 voice evacuation system in west building.

Elevators

Max Saket east building have 6 fire man switches and west building also have 6 fire man switches.

Smoke Management

Both buildings of Max Saket have exhaust fan, fresh air fan, P/A staircases, P/A lift wells.

IN CASE OF FIRE-

Emergency response team will check for Fire hazards (as a routine).

The moment anyone notices the Fire / smoke in the hospital, dial '14, 5211, 2801' and inform to the Telephone Operator his/ her name, department, exact location of code and then telephone operator Announces—CODE RED through PA System/ ERCC (Emergency Response Coordination and Communication).

Security personnel immediately flash an alert message, giving location of the fire on walkie talkie. The telephone operator will inform the Security Manager, Director Admin & Purchase, Med. Administrator, Administrator & All HOD's and all floor coordinators.

STAY OFF THE ELEVATOR

Turn off the TV and air conditioner IF ANY

Safety Manager with Fire Officer reaches the spot, judges the situation and according to the situation tries to control the Fire with available means (Fire extinguishers/ Fire Hose Reels/ Hose Pipes).

Other staffs remain in the respective areas and wait for the orders from the FIRE commander (Security Manager).

In case the FIRE is not under control and chances of threat to life is observed, then in consultation with Director Admin. & Purchase & Medical Administrator the Fire brigade is called upon.

Total evacuation can be on orders of Director Admin. & Purchase & Medical Administrator.

Patient can be shifted from IPD to OPD area and if required will be taken out of the building by nurses/ doctors/ GDA/ H Keeping / Technician to the safe area. HR supervisor removes important equipment & data to safe place.

Log the incidence in the incident register.

Fire indication detected at 'fire control panel' located at lower basement or by individual.

Extinguish the fire using fire extinguishers / hydrants.

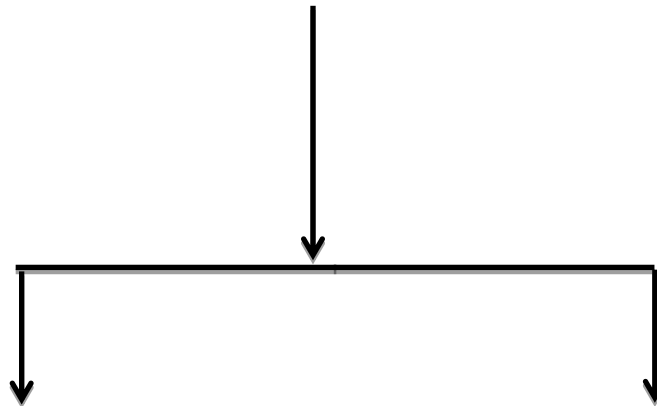
Security-

- **Crowd Management:** Security Manager / Supervisor will arrange guards to manage the crowd from the point of mishap till the assembly area. They will ensure crowd management in other floors as well.
- **Coordination in Evacuation:** Security Manager / Supervisor will coordinate for the arrangement of canvas stretcher from fire control room.

- Security Manager / Supervisor will assign a security in charge to the assembly point to coordinate the evacuation. They will communicate the situations timely to each other.
- Security Manager / Supervisor will coordinate with nursing in charge/ Team leader to evacuate.
- Security guards will ask all the ambulatory patients to link hands and he will lead them to the assembly area.
- Security Manager / Supervisor will ensure that the fire exit routes are open without any hindrance.
- When the evacuation is completed, he will ensure that a thorough search is conducted along with the nursing in charge and doctor and seal the area.
- **Census:** Security Manager / Supervisor will take the census (no. of patient's nurses+ GDA+ Housekeeping) from all the supervisors and order the assigned security guard on the floor to ensure that people are removed from the danger area and the room is closed.
- **Evacuation of ParkingArea:** For fire in (-1) & (-2) parking area, security personnel will ensure that vehicles are moved out of the hospital. Announcement will be done from the PA system to inform everyone for movement of vehicle.

FIRE FIGHTING- Security manager or security supervisor will build the team for fire-fighting.

COMPSITION OF FIRE FIGHTING TEAM



GM Operations Representatives

- Head of emergency
- Head of engineering/shift engineer
- Head of security/ Shift security officer
- Fire officer/fire man
- IRT& ERT
- Duty manager
- HK head/shift supervisor
- Nursing head/shift nursing supervisor
- Designated floor support team

EMERGENCY CONTACTS

- Fire brigade-101
- Police ambulance-100
- Other hospitals
- Vendor for bulk ice slab supply
- Water supply
- Area disaster management
- Committee office

DUTIES OF STAFF INVOLVED IN FIRE

Operational team commanded by GM- operations

- Exercise control, coordination and supervision over the entire emergency situation and its responsible for its overall performance
- Team may alter any or all parts of this plan on the spot, as per dynamic risk assessment
- Set up an emergency control center (ECC) at emergency base station/ front office desk
- Coordinate evacuation of patients/ staff, if require
- Coordinate with other nearest hospitals and ambulance services to shift the patients (if required)
- Team will inform to telephone operator to announce a message through public announcement system

Telephone operator

Message content- “Your attention please, there is an emergency in the building, Please evacuate by the nearest staircase. Follow all instructions as per fire signage. Please do not panic, Remember do not use the lifts, “Thank you”

- Head of security / security officer will be a member of core fire fighting team
- On priority arrange to remove the vehicles parked on the fire affected area and clear the route inside the premises for fire tender.
- Deny entry to other vehicles to effected areas.
- Supress panic and supervise fire fighting team to fight the fire effectively.
- Inform front office to evacuate OPD area for walk in patients.

HOS/ Security officer/ security staff

- Inform base station to keep all the ambulances ready in the start condition at emergency porch.
- Inform security vendor to provide extra security manpower to cordon off hospital premises and restrict entries of unauthorised people.
- Arrange to remove trapped person from the place of fire.
- Inform local police to provide assistance to cordon off area, to prevent unauthorised persons from entering the premises.
- Provide all assistance to fire brigade and police staff.
- Flight the fire
- Perform such duties / functions as the administer may assign to him, when not occupied elsewhere.

Head of engineering/ shift engineer / Engineering staff

- Engineering personnel will be a member of initial response team

- He will always carry emergency elevator keys
- Head of engineering will be member of core emergency command team.
- Cut off power to the affected area with intimation to concerned area staff cut off A/C supply as per requirement
- Ensure sufficient fire fighting equipment supply to extinguish fire.
- Engineering LT room & plant room should be manned all the time by a responsible person.
- Shut off main fuel line.
- Other rest of engineering staff should reach the site of fire with fire fighting equipment & tools.
- Ensure water & emergency power is in ready state to cater for emergency.

Maintenance Department

- **Lift Service Shut Off:** Shut the lift service in affected area and order them to move out of the place and ensure that lift service in unaffected area may not hamper.
- Maintenance Supervisor will inform to shut the lift at ground floor
- **HVAC & Electrical Supply Shut Off:** Ensure that the Air conditioning system and electricity supply is shut off from the affected area.
- **Water Supply :** Ensure water supply from the fire tank
- Switch on the pressurizing fans in the roof to remove the smoke

Housekeeping

- **Arrangement of Equipment / Linen for Patient Shifting:** Housekeeping supervisor / Manager will arrange housekeeping and GDA's to transfer the patients and equipment's in the affected area as well as assembly point.
- He will arrange wheelchairs to transfer the patients.
- Arrange linen for transporting the patients
- Ensure that doors of all rooms are locked after evacuation.
- Brief floor supervisor to make a detailed list of the extent of damage to property and submit the same to administrator and finance processing of insurance claim

Nursing-

Coordination in Evacuation:

- **Fire warden** - Nursing supervisor / team leaders will act as fire warden who shall be responsible for patient evacuation in coordination with doctors, security and GDA staff.

- Nursing supervisor or Team Leader will assign nurses in group of 3 each or as per the manpower availability:
 - While transferring the patient, a nurse will accompany the patient till assembly point. She will handover the file to the nursing staff/ supervisor and return to the affected area
 - If complete hospital is under fire then all patients can be shifted to civil hospital or any nearby hospital.
 - Wakeup customers (patients and attendants) and ensure that the rooms are vacated. This has to be done carefully, because customer woken up on account of fire is likely to panic.
 - Direct customers to assembly area (emergency porch)
 - If the order for evacuation is given, care must be taken by the Nursing personnel that all patients are accounted for

PRIORTIZING PATIENTS IN COORDINATION WITH DOCTORS

Nursing Supervisor will coordinate with doctors to adjudge patient as ambulatory patient, evacuation by wheelchair or stretcher etc.

- **Manpower Arrangement**
 - Nursing Shift Supervisor will provide the manpower in the affected area, as per the requirement
 - She will arrange & assign staff for assembly area.
 - Nursing shift supervisor will assign staff for evacuation.
- **F& B**
 - Shift loose cylinders to safe area, if any.
 - Supervise shifting of stores to secure area.
 - Switch off all gas burners of kitchen area.
 - Prepare his team to cater patients/attendance and staff with water and refreshments in assembly area.
- **Front Office Staff**
 - Act as information center by securing latest information from the fire fighting team and convey it to all concerned
 - Keep the consumer pacified.
 - Take out print of in house patient list.
 - Inform all OPD patients to evacuate the OPD area
 - Update the evacuation plan of customers. Take a roll call of all the customers at designated assembly area.
 - Coordinate with triage for ' Medical Aid Post' for customers other than patients.
 - Carry department log book, staff attendance details, patient details, to the assembly area (if possible)
 - Direct the public to assembly area
- **Biomedical engineering**

- Shut off the oxygen supply of the affected area after consulting the nursing in charge / team leader
- Provide portable oxygen cylinder, if required.
- **IT Department**
 - HOD will ensure that data will be secured to a safe place.
- **Other Staff Members**
 - Reach the assembly point via shortest possible route using fire escape
 - All other managers not specifically tasked should report to fire fighting team for any assignment he may wish to delegate.
- **Doctors**
 - Provide requisite medical assistance to injured patients / attendants/ staff
 - Make arrangements for additional stretchers and wheel chairs for handicapped.
- **Operational team report**
 - When fire will get contained completely head of security and head of engineering will take a complete round of hospital premises and will note down the details of the damages occurred.
 - Report of the same will be submitted to managements.
- **Order of Evacuation**
 - Patients in close proximity of the fire
 - Ambulatory patients
 - Helpless/non-ambulatory patients

Guidelines for Patient Evacuation:

1. Patients in close proximity to the fire and smoke will be moved first through the smoke/fire doors to a place of safety.
2. Ambulatory patients will be instructed to form a human chain and will be led to a place of safety beyond fire doors. One assigned person (security personnel) will head up the chain and another will bring up the rear.
3. Non-ambulatory patients will be moved with life support equipment when possible. **Oxygen shall not be used when going through a fire area.** Patients can be moved by wheelchairs and stretchers or placed on a blanket and pulled to a place of safety. Also, various emergency carries can be utilized to move non-ambulatory patients.
4. When possible, patients' records will be moved during evacuation.

Evacuation Procedures for Patients with Special Needs

1. Ventilator-Dependent Patients

a. If the ventilator has a battery back-up, leave the patient on the ventilator and move the patient to a safe area. Keep the patient attached to portable oxygen.

b. If the ventilator does not have a battery back-up, connect the patient to the main circuit and move out the patient to a safe area. Keep the patient attached to portable oxygen. remove the patient from the ventilator and manually ventilate “bag” the patient while transporting to an area of safety.

c. If the hospital becomes uninhabitable, ventilator-dependent patients must be evacuated directly to the nearest acute care hospital.

2. Bed bound patients: Nursing staff shall be knowledgeable in evacuating patients using stretchers, carries or movement of patient on a blanket to a safe area.

DIFFERENT TECHNIQUES OF TRANSPORTING THE PATIENTS

In the event of an emergency, non-ambulatory patients shall be directed along with an attendant to a safe area. Under circumstances, where it may be life threatening for the patients and their attendant to remain in that location, they must be evacuated via the fire exit. The following are examples of some techniques that may be used to transport a person.

Semi Ambulatory Evacuation Techniques

1. Side by side method

While standing beside your patient

- Reach around her back and grasp her wrist
- Keep patient close to you when walking to a safe area



2. Bear Hug

While standing behind your patient:

- Place your arms under her armpits
- Grasp the patient's left and right wrists, crossing her arms in front
- Gently prod your patient's legs in front to walk to a safe area



Non-Ambulatory Patients

1. Cradle Drop

- Make certain the bed will not move before doing this technique



- Place a blanket on the floor -partly under the bed and past the head of the patient
- Kneel beside the bed with one leg raised closest to the patient's head.
- Grip your patient under the knees and shoulders
- Lean back sliding your patient to the edge of the bed
- Rock back sliding your patient off the bed cradling your patient onto your lap
- Control the descent of your patient to the floor
- Fold the blanket around the patient and pull him head first to safe area

2. Swing Carry

This method requires two people

- First person raises the patient to the sitting position
- Second rescuer rotates the patient's legs 90 degrees from the side of the bed and lowers them off the side of the bed
- The rescuers sit on each side of the patient, placing the patient's arms on the shoulders of the rescuers
- The rescuers place their arms around the patient and grasp each other's upper arm
- The rescuers pass their other hand under the patient's knees and lock hands
- The rescuers lift the patient simultaneously and remove to a safe area



3. Extremity Carry

It requires two people

- One rescuer grasps the patient's legs in the vicinity of the knees
- The other rescuer places their arms under the patient's arms and clasps their hands on the patient's chest
- Both rescuers lift the patient and move him to a safe area



4. One Person Lift

This only works with a child or a very light person.

- Place your arms under the victim's knees and around their back.



5. Fire Fighter Carry

This technique is for carrying a victim longer distances. It is very difficult to get the person up to this position from the ground. Getting the victim into position requires a very strong rescuer or an assistant.



- The victim is carried over one shoulder.
- The rescuer's arm, on the side that the victim is being carried, is wrapped across the victim's legs and grasps the victim's opposite arm.

6. Pack-Strap Carry

When injuries make the firefighter carry unsafe, this method is better for longer distances than the one-person lift.

- Place both the victim's arms over your shoulders.
- Cross the victim's arms, grasping the victim's opposite wrist.
- Pull the arms close to your chest.
- Squat slightly and drive your hips into the victim while bending slightly at the waist.
- Balance the load on your hips and support the victim with your legs.



7. Four Handed Seat

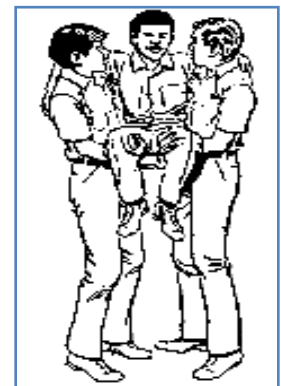
This technique is for carrying conscious and alert victims moderate distances. The victim must be able to stand unsupported and hold themselves upright during transport.

- Position the hands as indicated in the graphic.
- Lower the seat and allow the victim to sit.
- Lower the seat using your legs, not your back.
- When the victim is in place, stand using your legs, keeping your back straight

8. Two- Handed Set

This technique is for carrying a victim longer distances. This technique can support an unconscious victim.

1. Pick up the victim by having both rescuers squat down on either side of the victim.
2. Reach under the victim's shoulders and under their knees.
3. Grasp the other rescuer's wrists.
4. Form the squat, with good lifting technique, stand.
5. Walk in the direction that the victim is facing.



9. Chair Carry

This is a good method for carrying victims up and down stairs or through narrow or uneven areas.

NOTE: The chair used should be a sturdy one.



Don't use aluminium beach chairs, resin patio chairs, swivel chairs, or lightweight folding chairs.

REMEMBER: *Chairs with wheels can be used to roll the victim, but should not be used for a carry.*

1. Pick the victim up and place them or have them sit in a chair.
2. The rescuer at the head grasps the chair from the sides of the back, palms in.
3. The rescuer at the head then tilts the chair back onto its rear legs.
4. For short distances or stairwells, the second rescuer should face in and grasp the chair legs.
5. For longer distances, the second rescuer should separate the victim's legs, back into the chair and, on the command of the rescuer at the head, both rescuers stand using their legs.

10. Three-Persons Carryor Stretcher Lift

This technique is for lifting patients onto a bed or stretcher, or for transporting them for short distances.

1. Each person kneels on the knee nearest the victim's feet.
2. On the command of the person at the head, the rescuers lift the victim up and rest the victim on their knees



If the patient is being placed on a low stretcher or litter basket:

On the command of the person at the head, the patient is placed down on the litter/stretchers.

If the victim is to be placed on a high gurney/bed or to be carried:

At this point, the rescuers will rotate the victim so that the victim is facing the rescuers, resting against the rescuers' chests.

3. On the command of the person at the head, all the rescuers will stand.
4. To walk, all rescuers will start out on the same foot, walking in a line abreast.



11. Extra Carry By Two Rescuers

Two rescuers place the person being assisted on the staircase landing. One rescuer at the legs, places their arms under the person's shoulders with fingers locked across the chest. Lifting at the same time, with backs erect using the strength of their legs, the rescuers slowly rise to a standing position and then proceed carefully forward



12. Scoop Stretcher

1. Adjust stretcher length.
2. Lift patient slightly and slide stretcher into place, one side at a time.



3. Lock stretcher ends together.
4. Secure patient and transfer to the cot.

13. Improvised Stretcher

This technique requires two poles/pipes strong enough to support the victim's weight and at least two shirts.

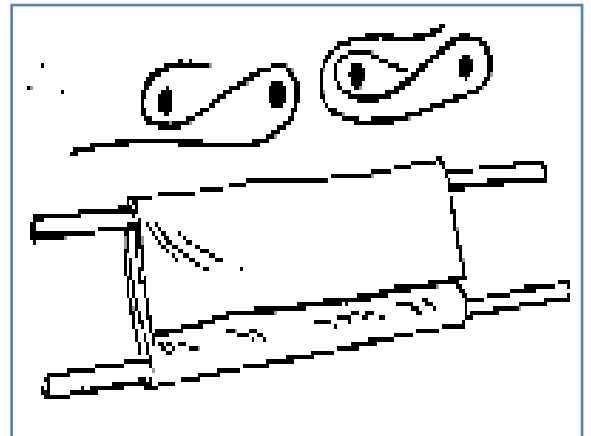
REMEMBER: *Rescuers should not give up clothing if, for any reason, this might affect their health, welfare, or reduce their effectiveness.*

1. While the first rescuer is grasping the litter poles, the second rescuer pulls the shirt off the head of rescuer one.
2. All buttons should be buttoned with the possible exception of the collar and cuffs.
3. The rescuers then reverse the procedure and switch sides.

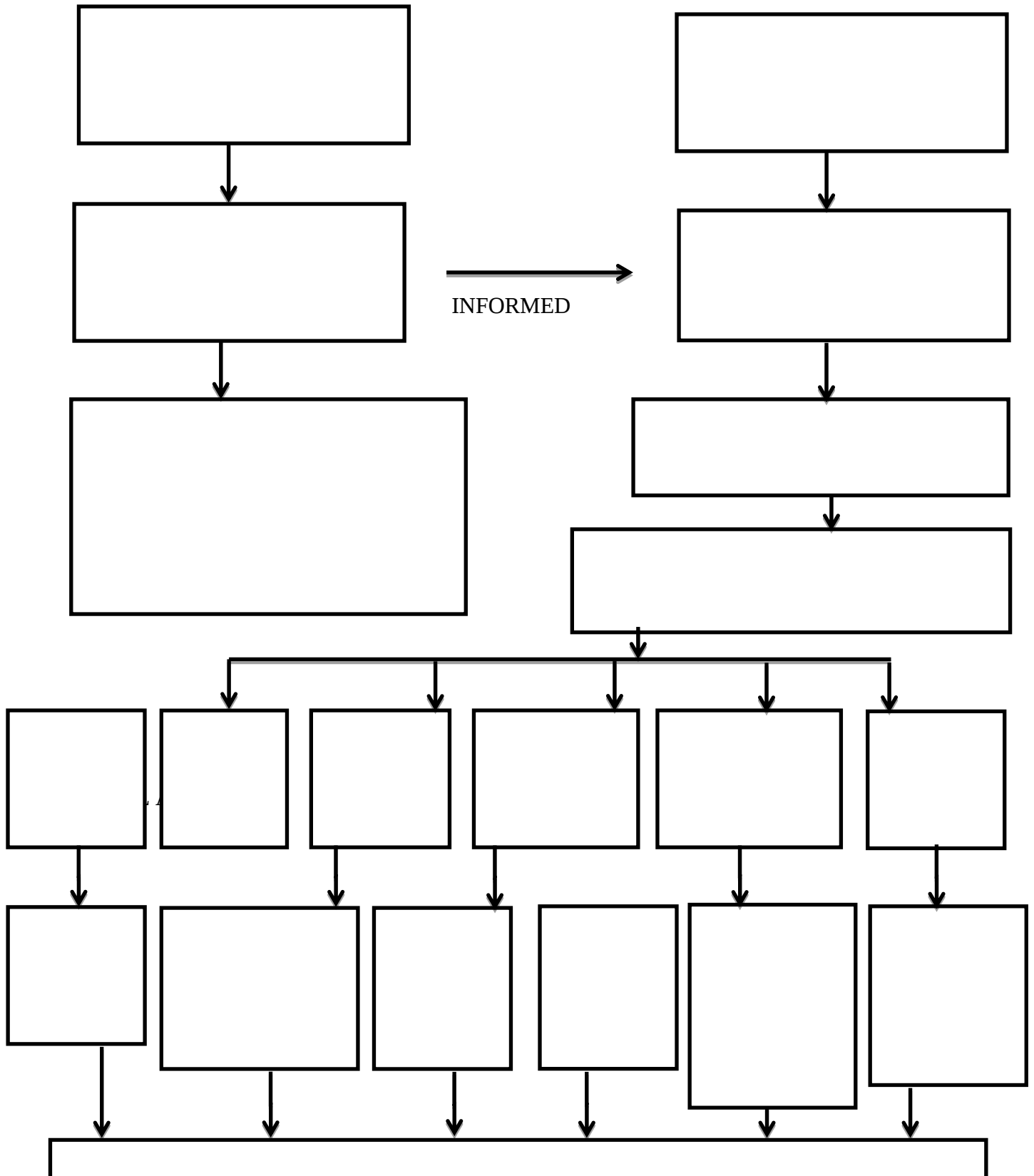
14. Blanket Stretcher

This technique requires two poles and a blanket.

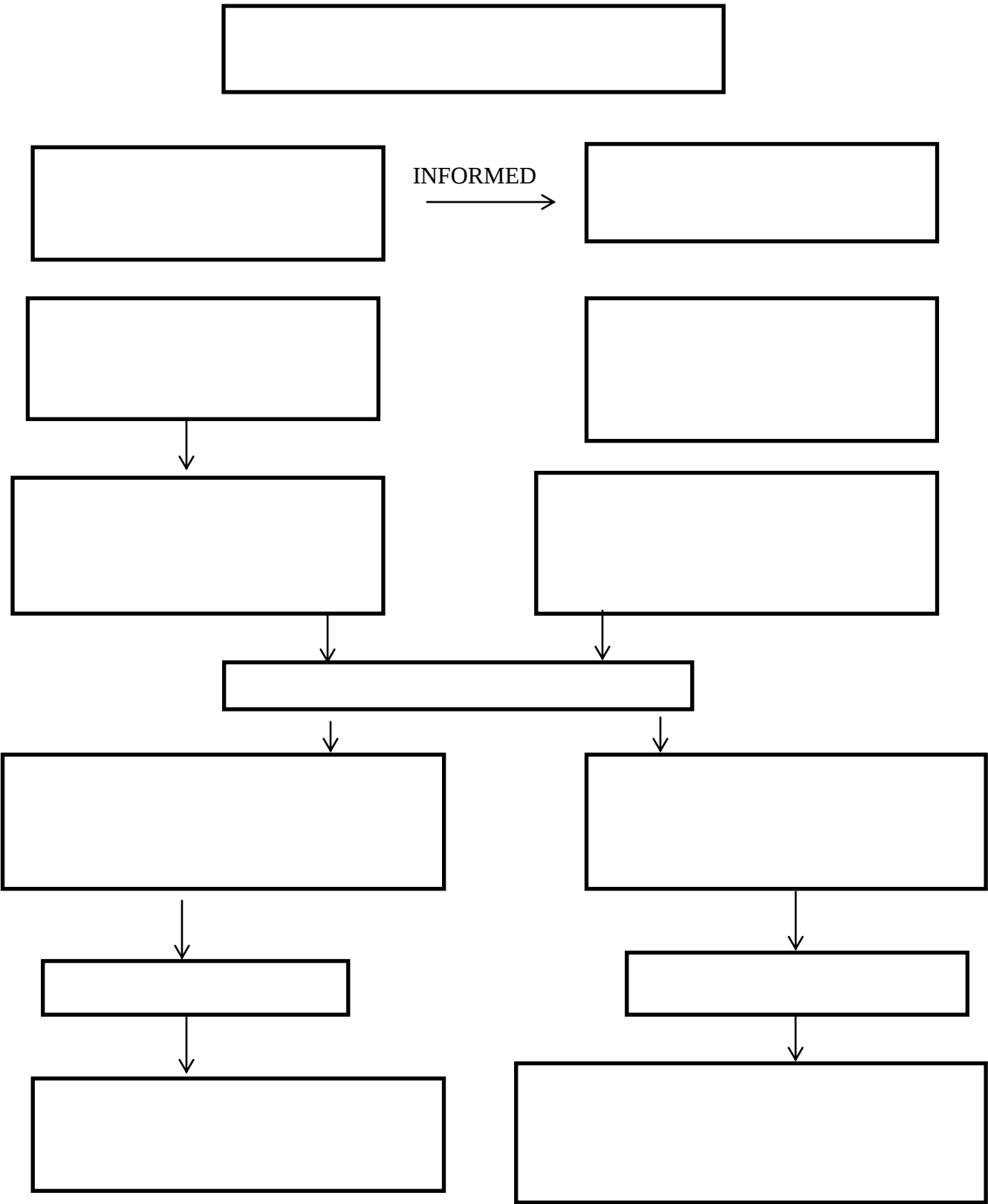
1. Place the blanket down on the ground.
2. Place one pole approx. 1 foot from the middle of the blanket.
3. Fold the short end of the blanket over the first pole.
4. Place the second pole approx. 2 feet from the first (this distance may vary with victim or blanket size).
5. Fold both halves of the blanket over the second pole.

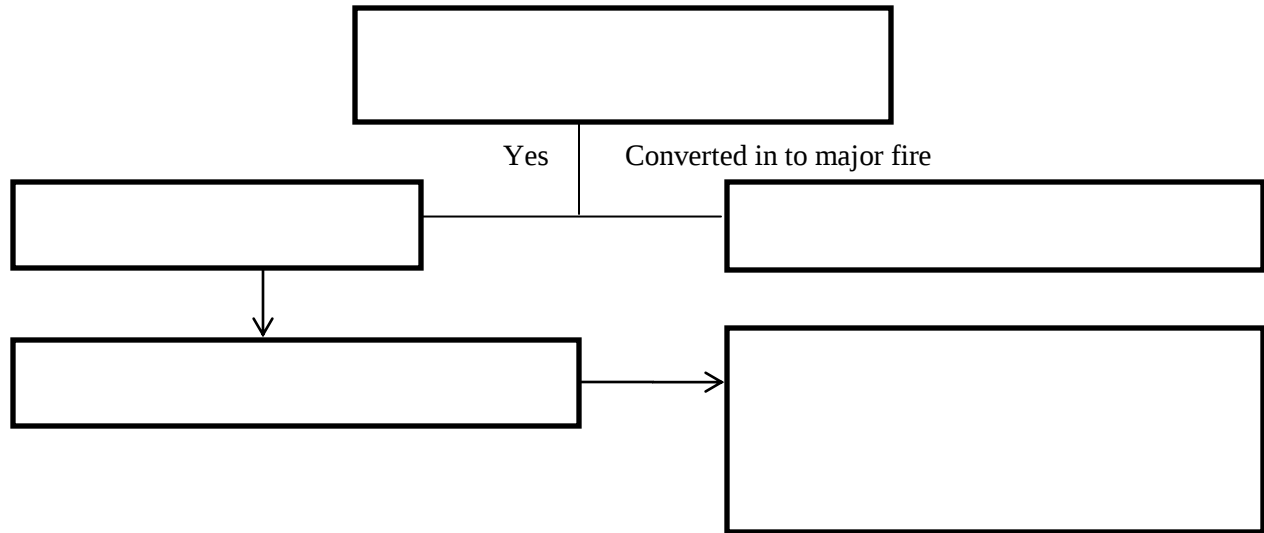


INITIAL RESPONSE TO THE FIRE

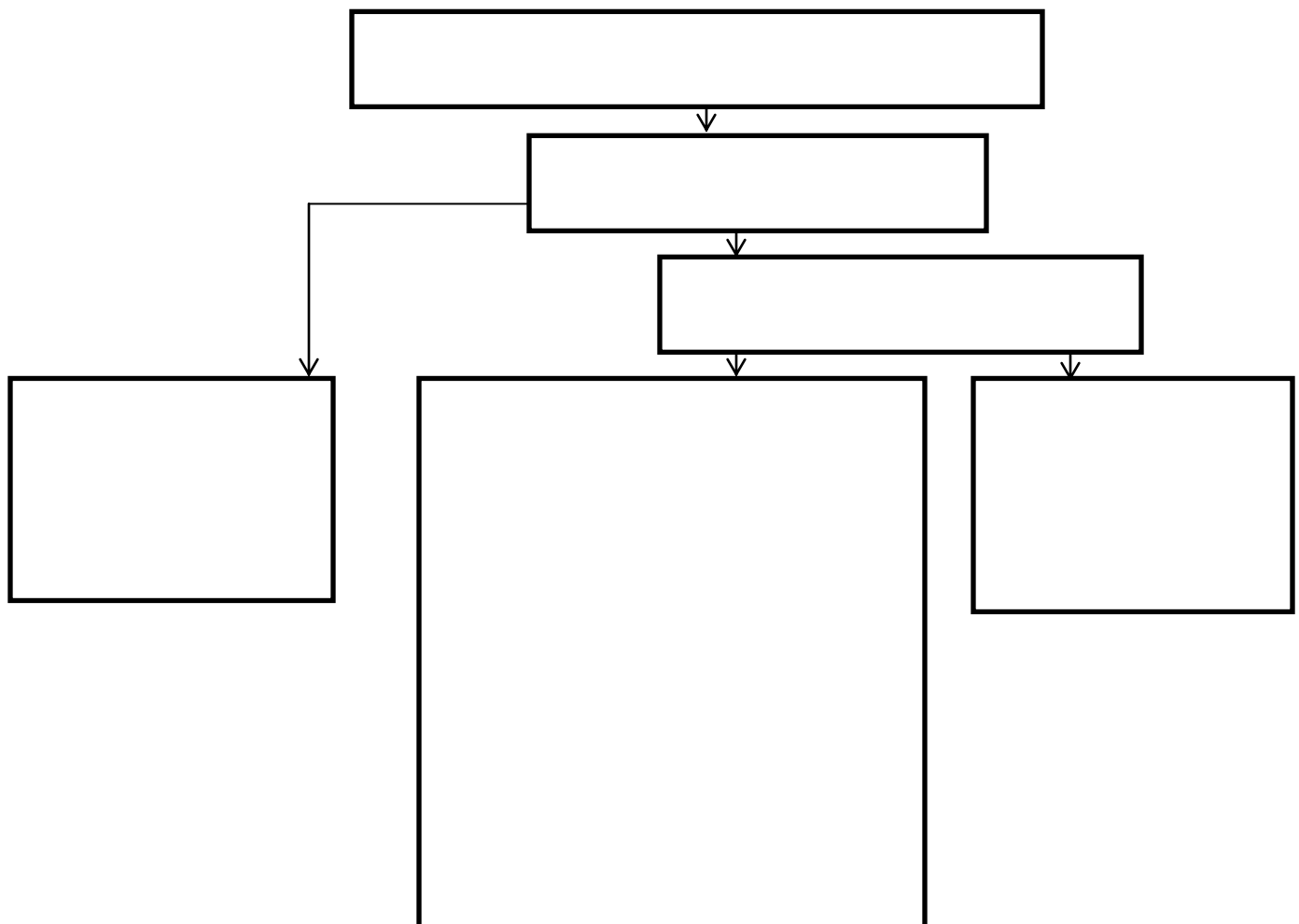


INITIAL ACTION PLAN FOR MINOR FIRE



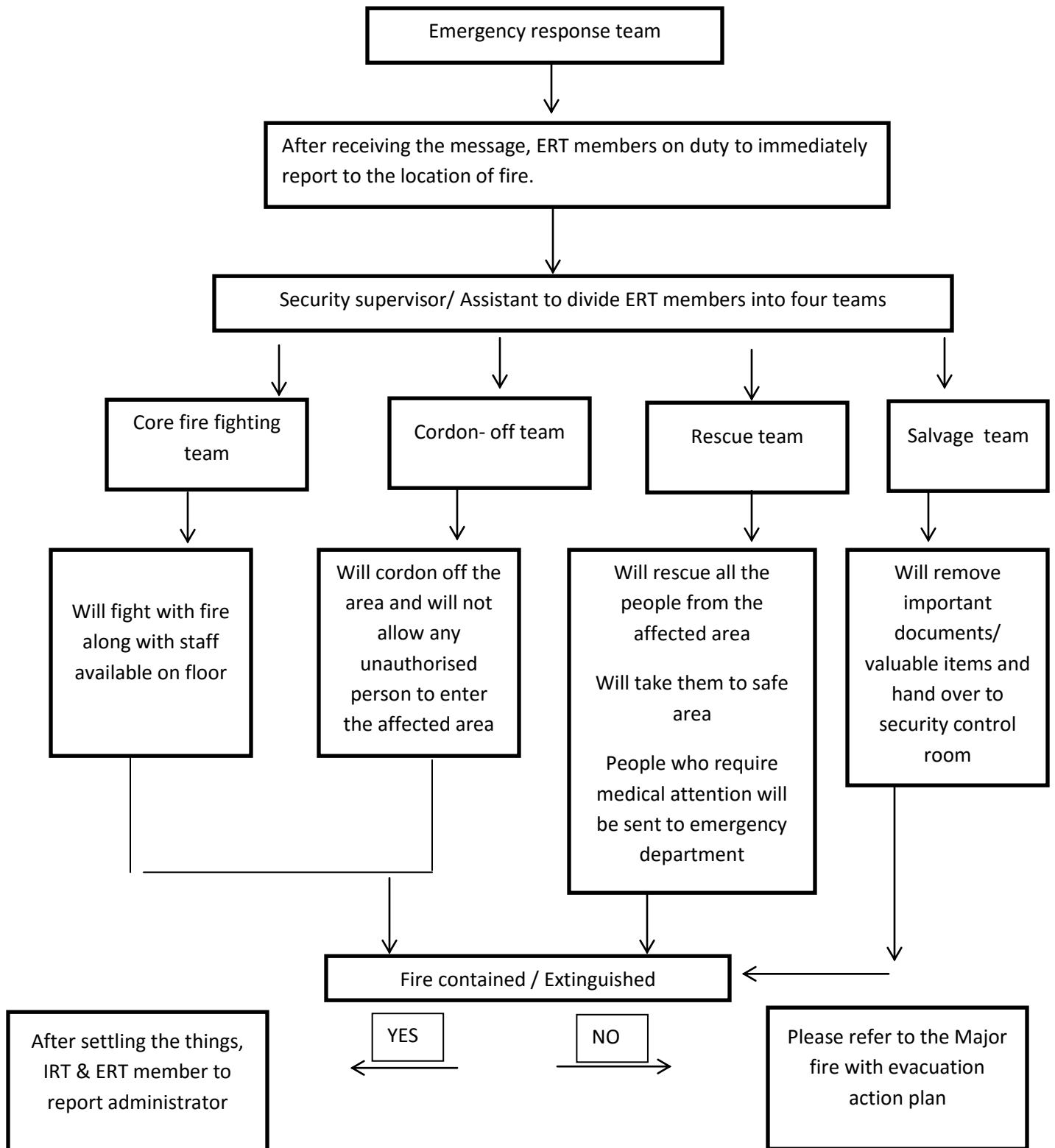


MAJOR FIRE WITHOUT EVACUATION

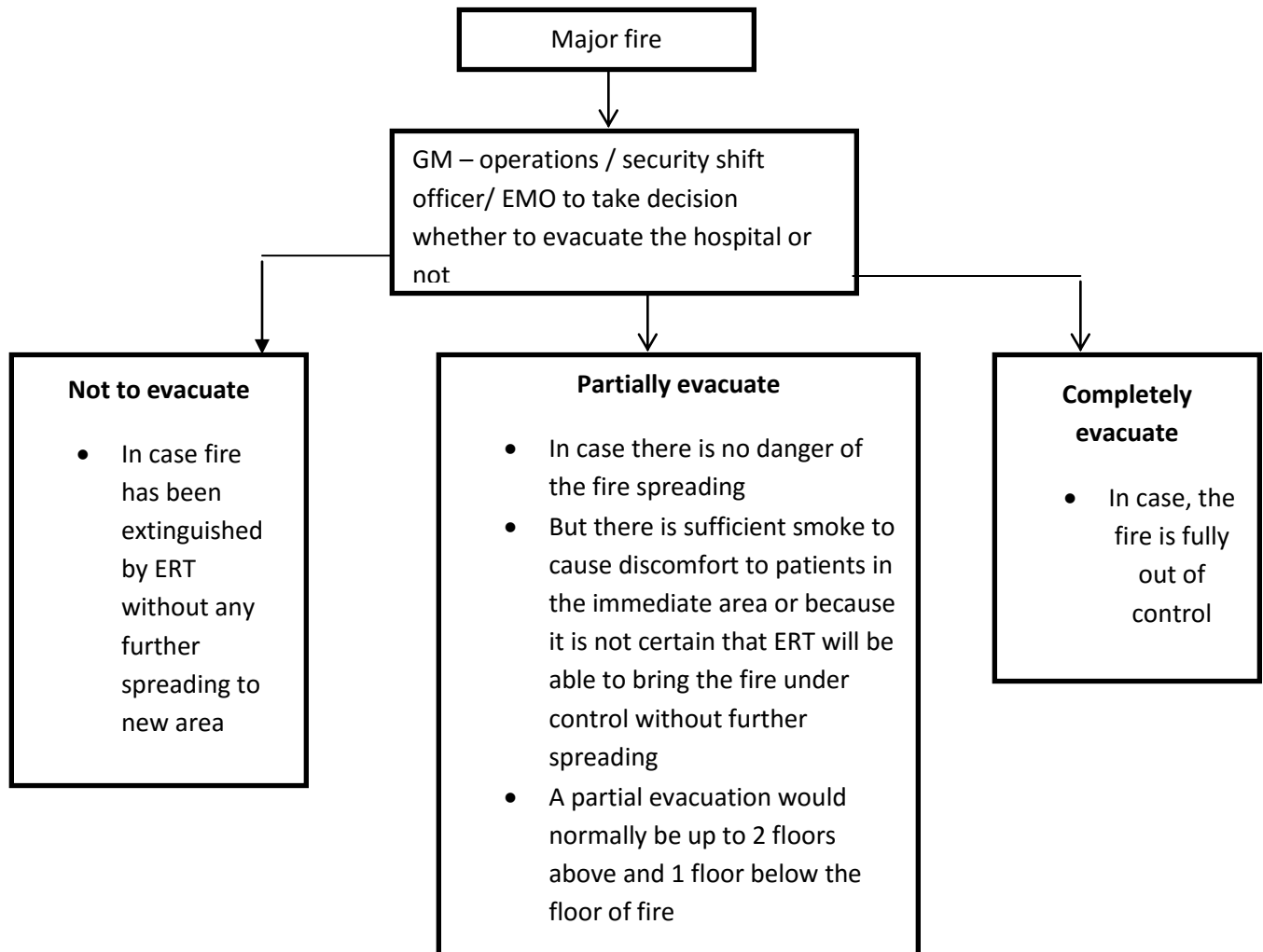


Message Content-

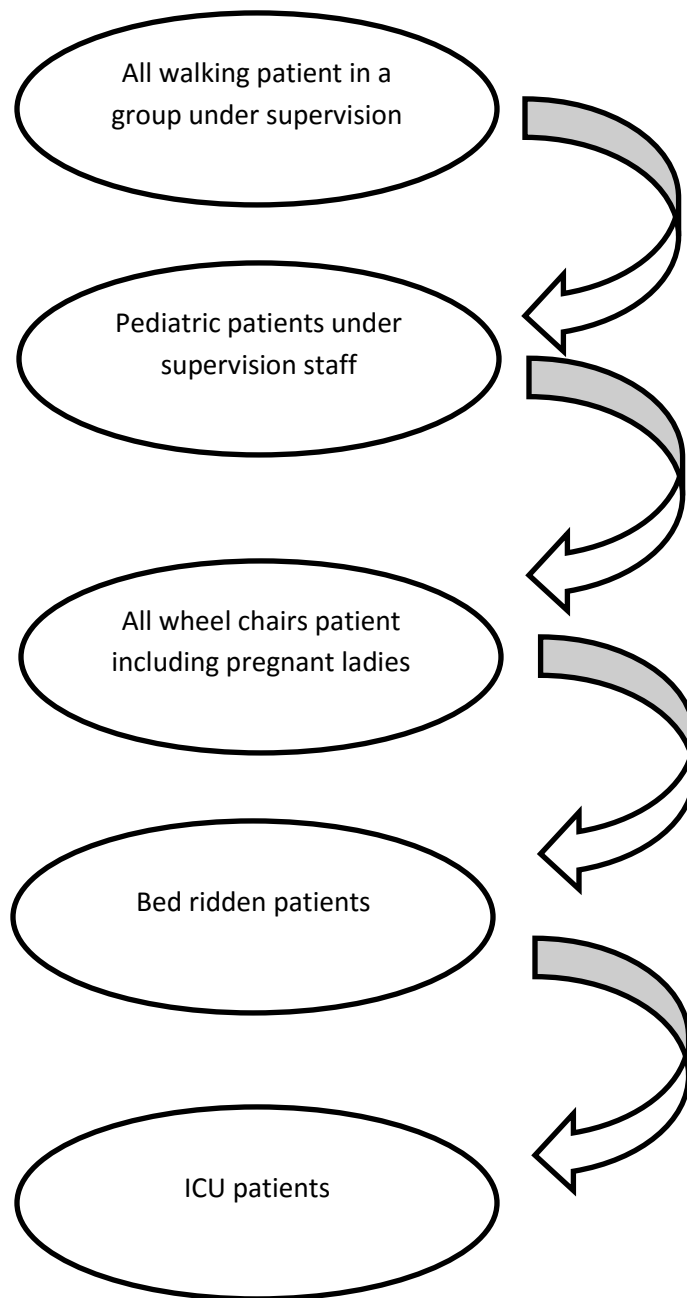
There is a confirmed fire---type, at---location



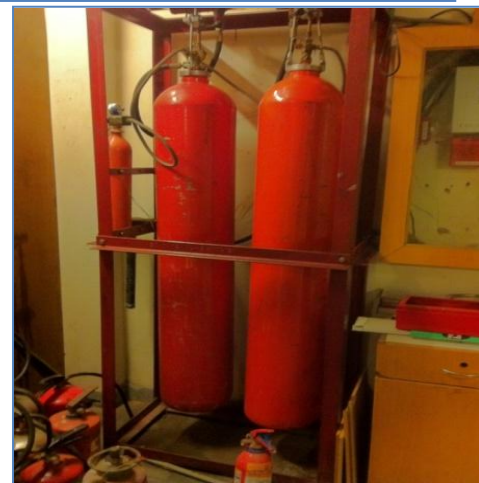
**INITIAL DECISION IN CASE OF MAJOR FIRE WITH PARTIAL/ FULL
EVACUATION**



EVACUATION OF PATIENT ON THE BASIS OF PRIORITY



Equipment's used during fire disaster



RECCOMENDATIONS

- There must be proper signage for fire exit so that patients and their attendants can understand easily
- Additional fire signage must be there
- Frequent training and mock drills must be there
- Patient evacuation drills must be there. Education and training of the staff of the hospital about the plan and specific roles of each staff member in case of a disaster
- All safety measures are present in Max, Saket but they are not appropriate for a new user.
- There must be clear instruction board so that untrained person can also understand what to do at the time of disaster and can help others also.
- The Fire Exit location Posters should be placed such that they are noticeable and easy to understand

Conclusion

Regular mock drills are essential part of training program so that staff will not come under panic when any disaster occur. Patient and attendant mock drill is also required time to time so that they can protect themselves.

References

- <http://myhsc.suhscsreveport.edu/>
- [http://www.hpsdma.nic.in/NDMA Guidelines on Disaster Management Final Action Points.pdf](http://www.hpsdma.nic.in/NDMA_Guidelines_on_Disaster_Management_Final_Action_Points.pdf)
- [http://www.hpsdma.nic.in/NDMA Guidelines on Disaster Management Final Action Points.pdf](http://www.hpsdma.nic.in/NDMA_Guidelines_on_Disaster_Management_Final_Action_Points.pdf)
- http://www.undp.org/content/dam/india/docs/guidelines_hospital_emergency.pdf