Summer Training at
Max Super Specialty Hospital, Saket, New Delhi
(April 3 to June 2, 2017)

- **Thrombolysis in Stroke: Door to Needle Time and Sources of in-Hospital Delay**
- **Study on No-Show Patients: Reasons for not Maintaining Scheduled Appointments by Patients in Urology Department**
- **Medication Turnaround Time in IPD Settings**

By
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Under the guidance of
Dr. Monika Chaudhary

MBA Hospital & Health Management
2016-2018

Institute of Health Management Research
The IIHMR University, Jaipur
2017

INSTITUTE OF HEALTH MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

CERTIFICATE

This is to certify that Mr./Ms. Keerti S. Nair has undergone summer training in (Organization name Max Super Specialty Hospital, Saket) from 3rd April to 2nd June 2017.

The candidate herself/himself completed the project assign to his/her during summer training.Her approach to the project was sincere and proactive.This summer training is in partial fulfillment of the course requirement recommended for the award of MBA in Hospital and Health Management.

I wish him/her success in all her future endeavors.

Col. (Dr.) Ashok Kaushik

Dean (Academic & Student Affair)

The IIHMR University, JaipurThe IIHMR University

Name of the Mentor Monika Chaudhary

Designation Associate Professor

MAX HEALTHCARE
Care for life

CERTIFICATE OF COMPLETION

MAX INSTITUTE OF MEDICAL EXCELLENCE

This is to certify that

Dr. Keerti.s Nair

has been associated as an

INTERN

with the department of

MEDICAL ADMINISTRATION

for a period of

3rd April 2017 to 2nd June 2017

at

Max Super Specialty Hospital,
Saket

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

Head of the Department

Dr. Shubnum Singh
Dean - Nursing, Allied Health, & Wellness Programs
Max Healthcare, New Delhi

Ms. Brigitte Wuethrich
General Manager
Max Institute of Medical Exellence
Max Healthcare

ACKNOWLEDGEMENT

The internship opportunity with Max Super Specialty Hospital, Saket was a great chance for learning and professional development. I am also grateful for having a chance to meet so many wonderful people and professionals who led me though this internship period.

I am highly grateful and would like to express my deepest gratitude and special thanks to my mentor, Dr. Sandeep Mor, Deputy Medical Superintendent at Max Super Specialty Hospital, Saket, who in spite of being extraordinarily busy with his duties, took time out to hear, guide and keep me on the correct path and arranging all facilities to make life easier and allowing me to carry out my project at their esteemed organization during my summer internship. I choose this moment to acknowledge his contribution gratefully.

I perceive as this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way.

Sincerely,

Dr. Keerti. S. Nair

Dr. Sandeep Mor

DMS (Deputy Medical Superintendant)

Max Super Specialty Hospital, Saket

Place: New Delhi

Date: June 1, 2017

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ABBREVIATIONS

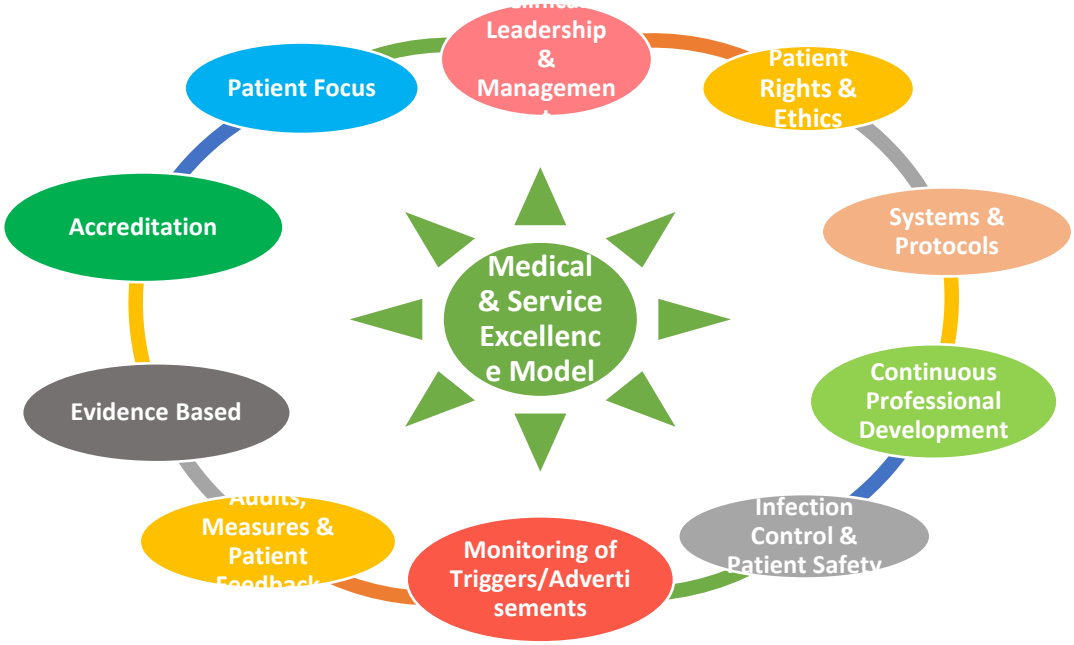
ABBREVIATIONS	Meaning
ALOS	Average Length of Stay
COW	Computer on Wheels
CPRS	Computerised Patient Record System
CTVS	Cardiac Thoracic Vascular Surgery
EMR	Electronic Medical Record
ERCC	Emergency Response Coordination & Communication
ERT	Emergency Response Team
ICS	Incident Command System
IRT	Initial Response Team
ERT	Emergency Response Team
MAMBS	Minimal Access, Metabolic & Bariatric Surgery
MD	Doctor of Medicine
MDDF	Max Devki Devi Foundation
MLC	Medico-Legal Case
MPH	Master in Public Health
MSSH	Max Super Specialty Hospital
NABH	National Accreditation Board of Hospitals
NABL	National Accreditation Board of Laboratories
PAC	Pre-Anaesthetic Clearance
PAHO	Pan American Health Organization
PCP's	Primary Care Physicians
PPE	Personal Protection Equipment

RRT	Rapid Response Team
SCR	Security Control Room
TAT	Turn Around Time
TSSU	Thermal Sterile Supply Unit
TTI	Transfusion Transmitted Infections
WHO	World Health Organisation

OBSERVATIONAL LEARNING

INTRODUCTION

Max Healthcare is committed to the highest standards of medical & service excellence, 'Patient Centred Care', scientific knowledge and medical education. The country's leading comprehensive provider of standardized, seamless and international class healthcare services. 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.

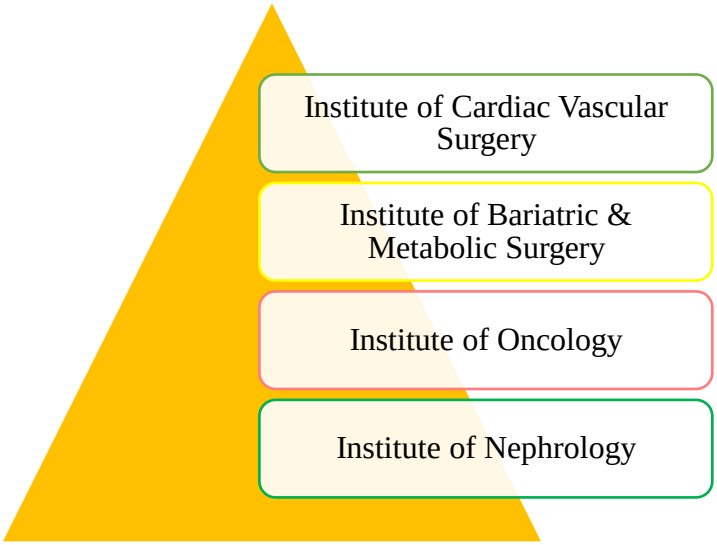


The pillars of this model include:

- 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 Administrative staff, the HODs on the managerial issues, communicating with the other staff and going through the records.

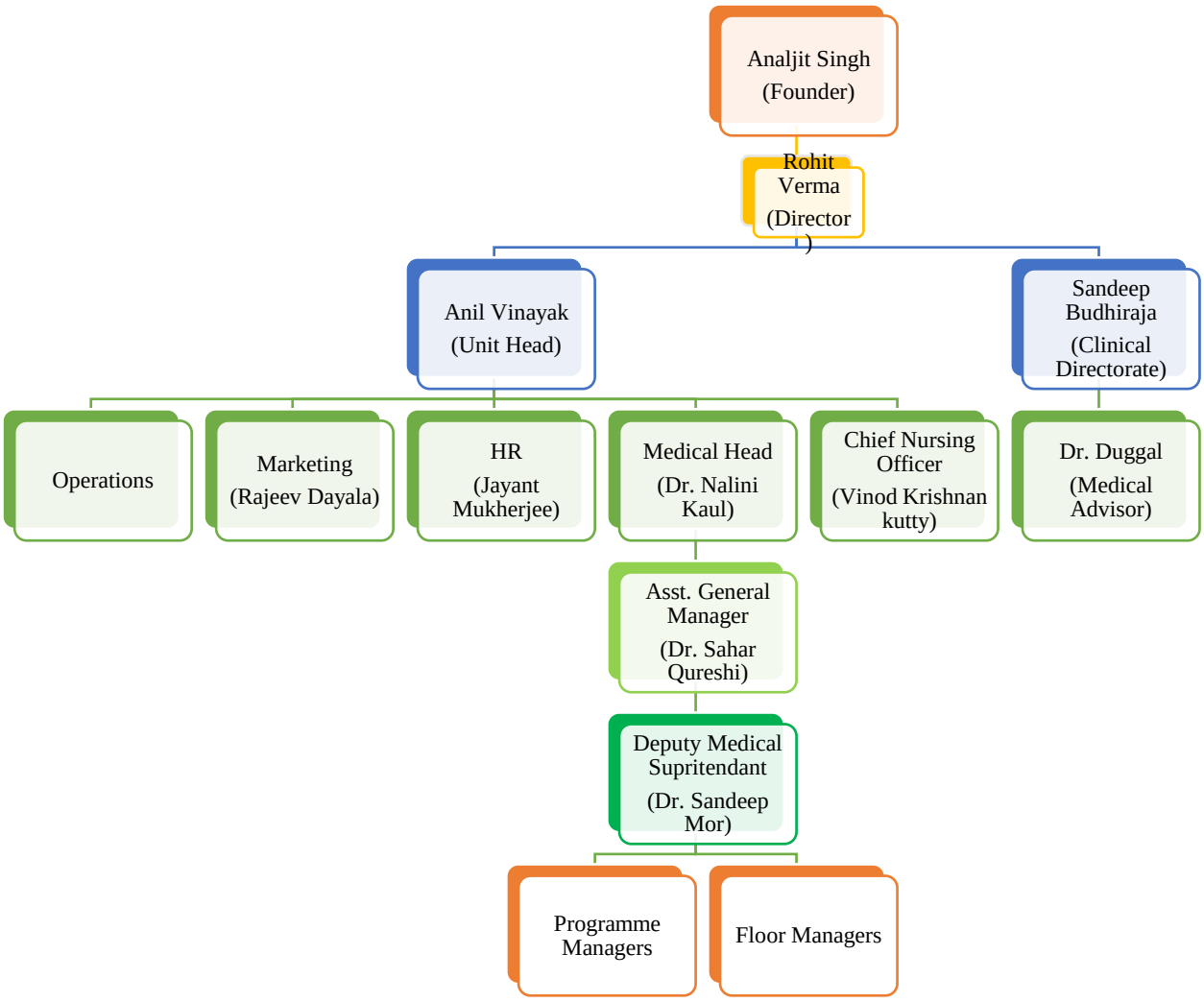
Sources of Data

- Primary
- By interacting with the HODs, executives, Doctors, Nursing staff and other valuable employees of the hospital.
- 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

ORGANIZATIONAL CHART



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.

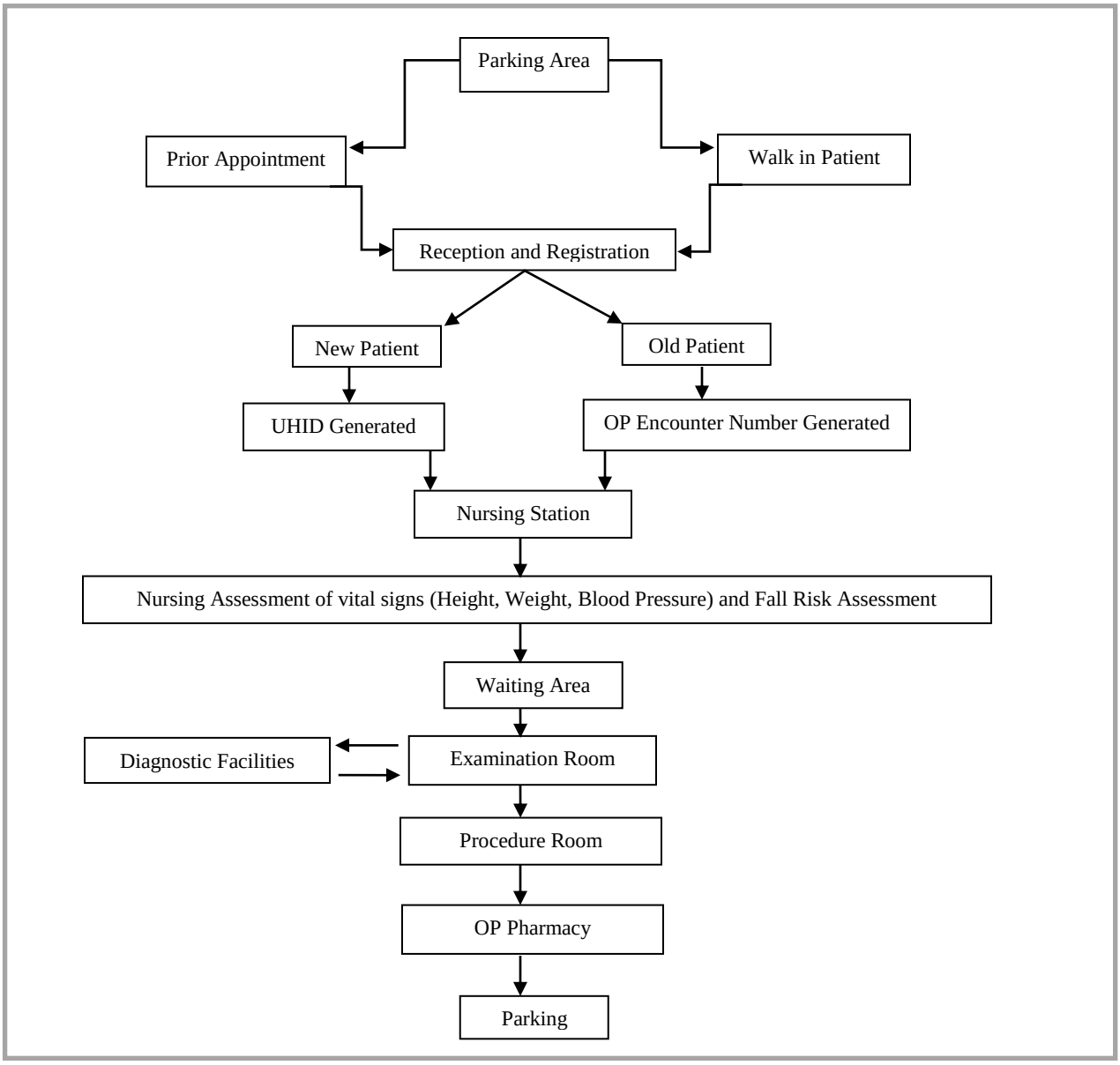
Challenges

- Shortage of staff
- Huge rush during peak hours, 9:00 am-12:00 pm.

OUT-PATIENT DEPARTMENT

- Each INSTITUTE of Max hospital, Saket 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:

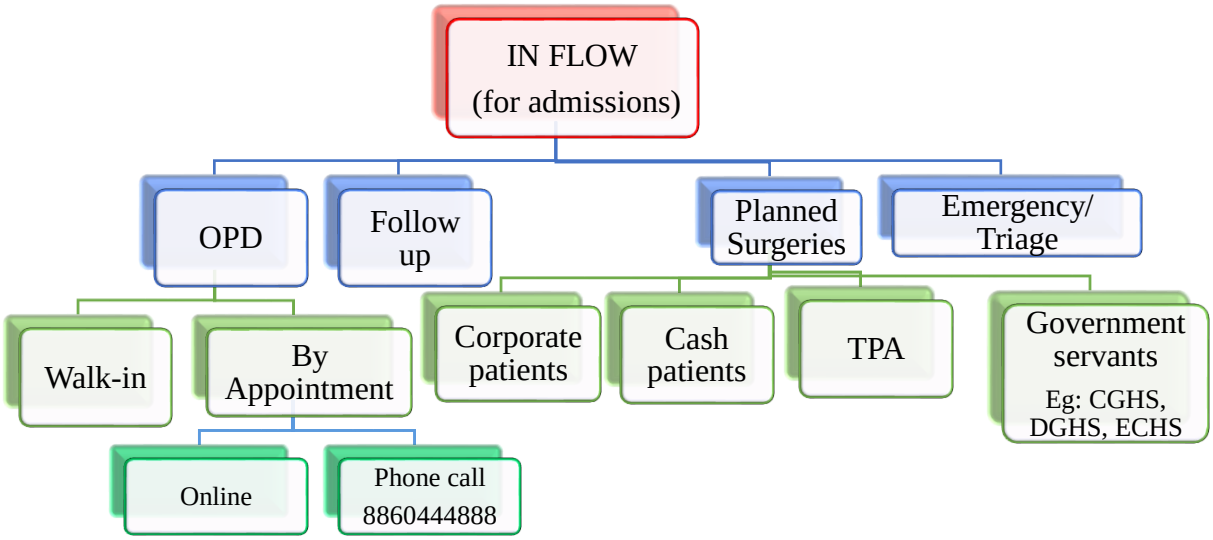


ADMISSIONS DESK

- 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, double, classic deluxe 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

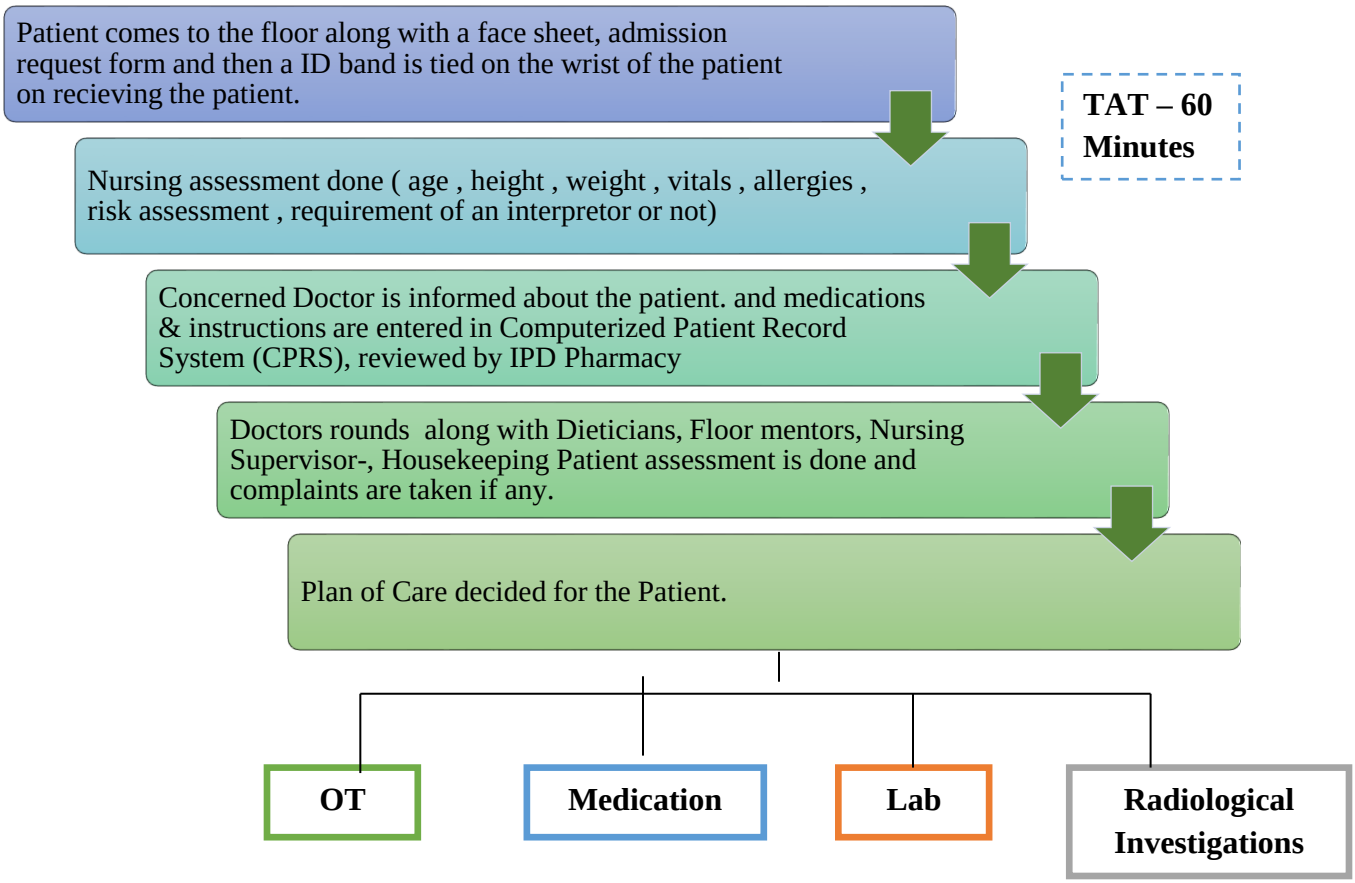


Hierarchy

IN-PATIENT DEPARTMENT (IPD)

- IPD is distributed over Six floors (G.F., 2nd-6th) in the east and Five Floors (2nd-6th) in the west wing of Max hospital including a total number of 311beds in East & 211 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:

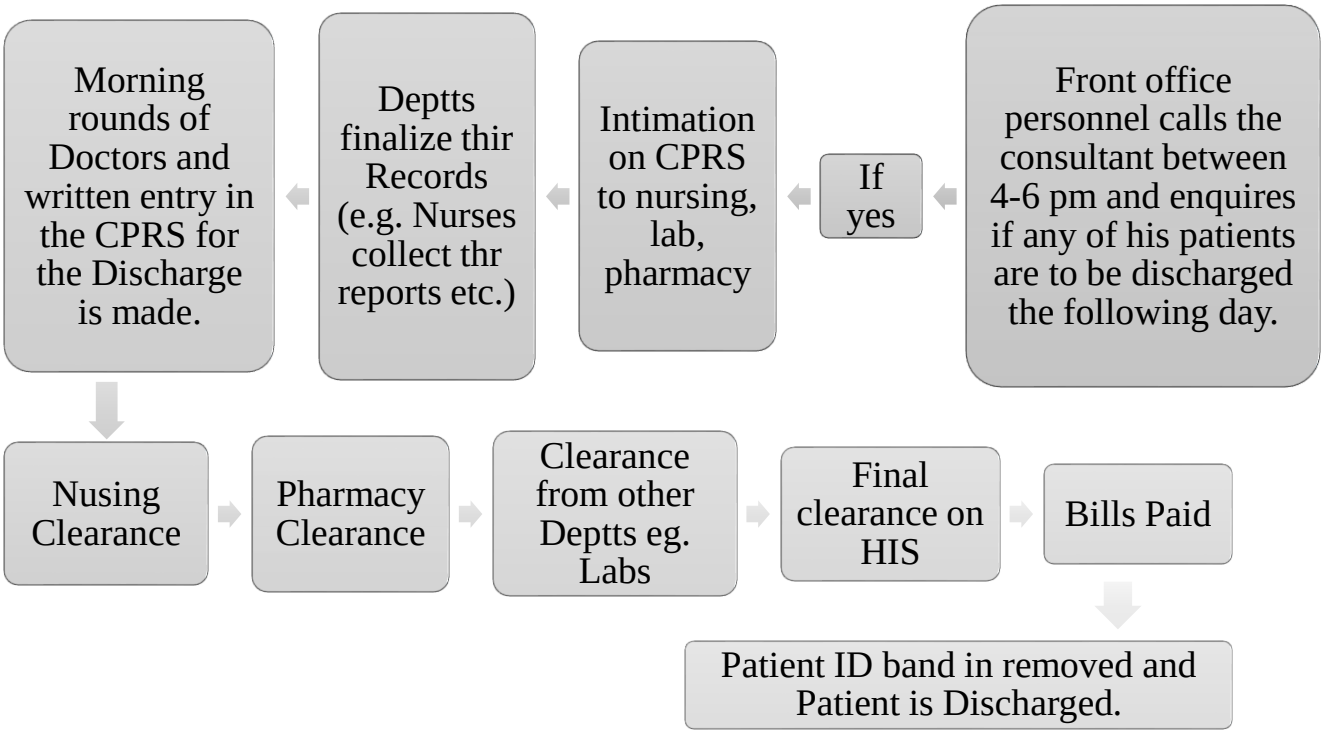
        - Economy room – 4 beds per room.
        - Double – 2 beds per room
        - Single Deluxe
        - VIP suite
- Every floor has a central nursing station with
    - Information Board covering:
        - Designation & Contact numbers of
            - Duty doctor
            - Administration Staff
            - 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, Hypoglycemia, Needle stick Injury
- Process of admission of new patient to IPD



- **<u>BARRIER NURSING-</u>**
  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.

- **<u>REVERSE BARRIER NURSING</u>-**
  Done in cases where patient is immuno-compromised so that infection doesn't travel to him from others.

- **<u>Discharge</u>** Process flow of patient from IPD



- Documents included in Discharge of a patient- Discharge Slip, In-patient Bill (Summary + Detailed), Discharge Summary, Pre-authentication approval letter (in case of TPA), Doctor's Clarification and reports of the patient.
- Delay in Discharge is seen due to Final Bill clearance, TPA approval, finalizing discharge summary.

EMERGENCY DEPARTMENT

Due to the unplanned nature of patient attendance, this department provides initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention, except for major burns. It is located at the ground floor with its own dedicated entrance from outside and to inside of the hospital 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 Specialty Hospital, Saket has 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<3min
- Ambulance response time<10 min

Infrastructure:

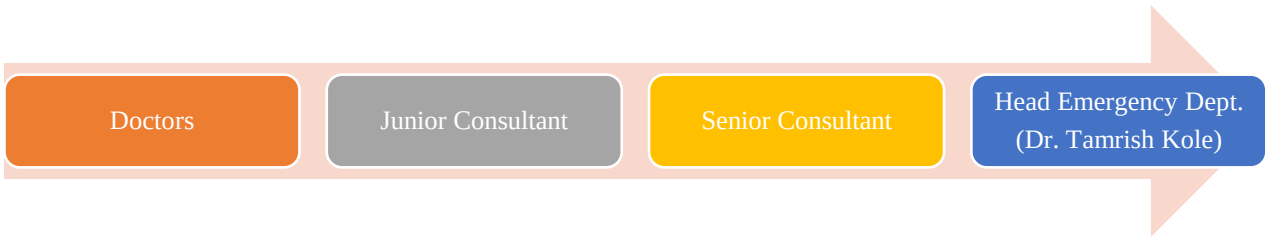
Total 25 bedded

- Resuscitation suite -2 bed
- Urgent care area – 9 beds
- Observation area – 12 beds
- Triage – 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.

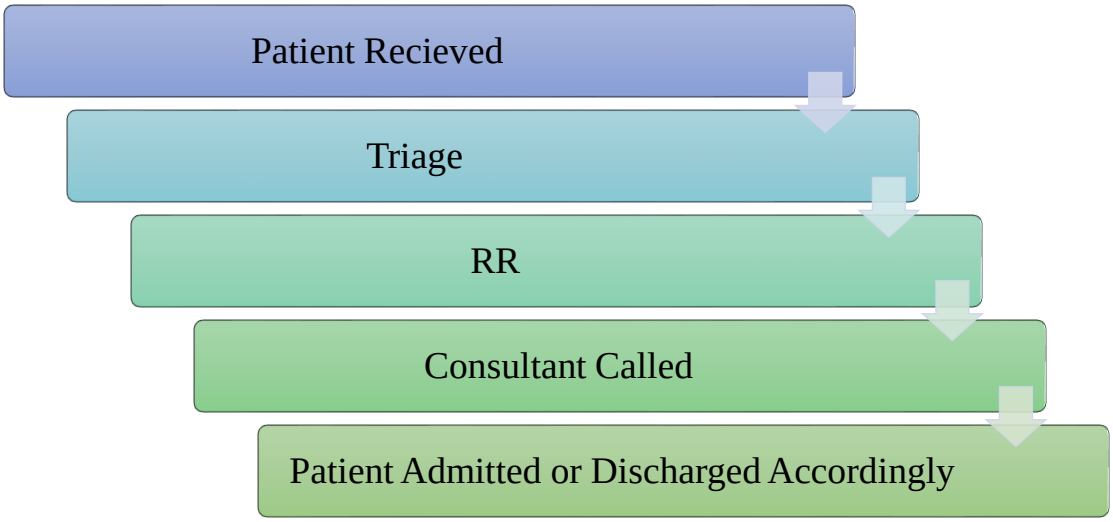
Staffing:

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.

Hierarchy



Process Flow



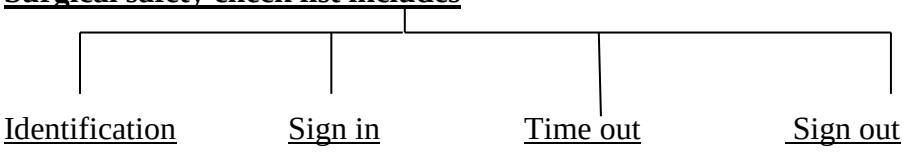
OPERATION THEATER COMPLEX

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, 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, gynaecology, Brain Suite intervention, general and robotic surgeries are performed here. 8th OT was under-construction.

Organization of staff: The staffs of Operation Theatre are organized into four groups: Anaesthetist- Surgeon, Nursing staff, Technician and Supportive staff.

- Nursing Station – 1
- Pre-Op Beds and Recovery Beds – 4 each
- Scrub Station - 2
- Average number of cases done per day – 20-25 in each wing, 15-16 Robotic Surgeries per month
- Temperature - 21 approx
- Humidity – 50-55

- Light – 2000 lux 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, TAT-45mins).
- Staffing ratio- Nurses: patients – 4:1(pre-op) ; 2:1(post-op)
  Technicians: patients- 1:1
- OT Utilization – average is 70%
- Max super specialty 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.
- Sterilization is done by ETO (12 hrs); autoclave. Fumigation is done twice a day in the morning and evening.
- Bio medical waste disposal is done every 2 hours.
- **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 13 Intensive Care Units and 5 High Dependency Units in the Hospital:

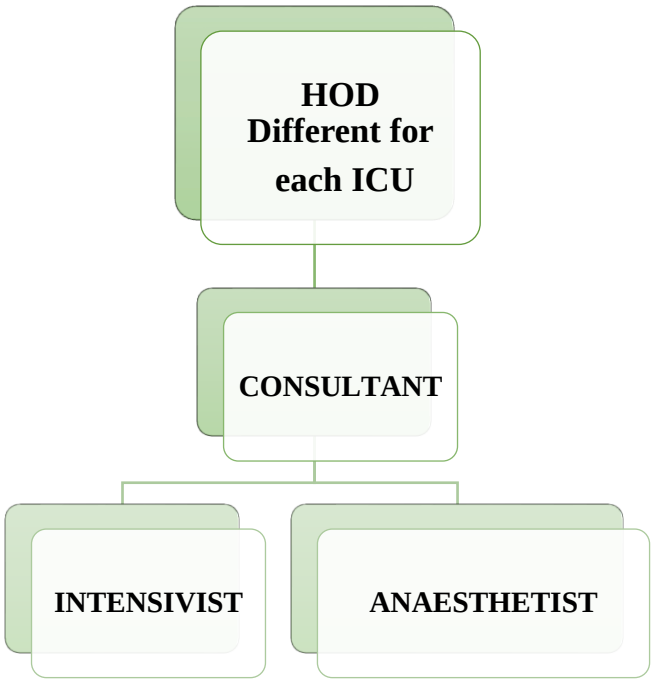
Floor	East	No. of Beds	West	No. of Beds
G.F.	Apex Coronary Care	16		
1st Floor	CTVS	17	Surgical	11
	Cath Recovery	14	Neuro-Surgical	9
	Paediatric CTVS	11	Neuro-HDU	9
			ISCU	4

2nd Floor	Onco-Surgical Onco-Medical CTVS- HDU Cardiac HDU	9 12 4 4	Stroke and Neuro	8
3rd Floor	Medical	8	Neonatal (a) Neonatal (b)	8 6
4th Floor			PICU	8
5th Floor			Ortho HDU	8
6th Floor			Medical	8
		95		**79**

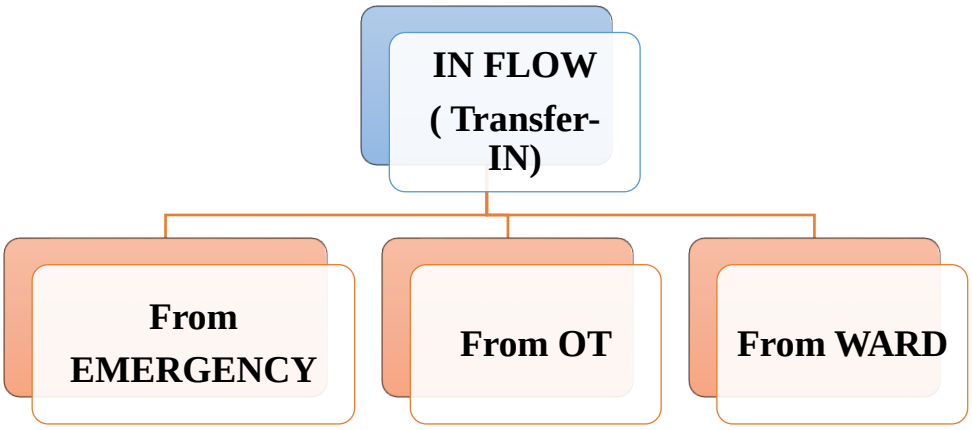
All Intensive Care Units have a 24-hour service of Intensivist and an Anesthetist.

- Each ICU has 1 medication room, 1 Nursing Station, 1 Dr. room

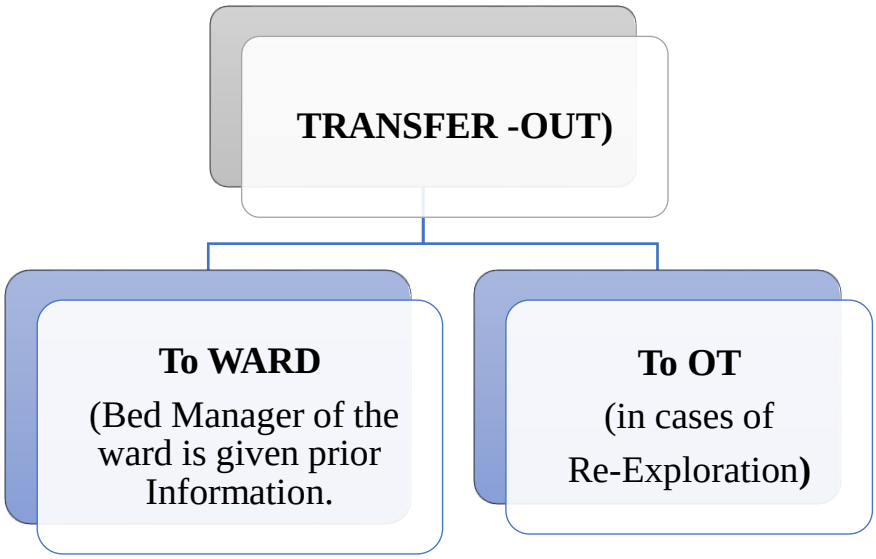
Hierarchy



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; Family Meeting – 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 (EPS)
  - 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

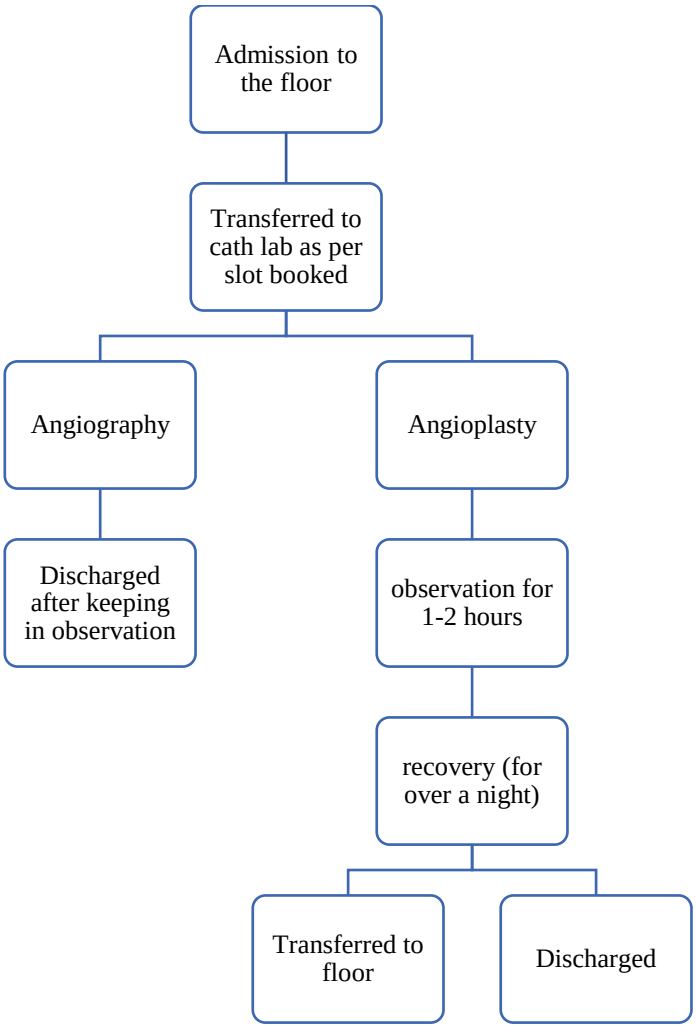
Units of cath lab:

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-3 Beds
8. Instrument washroom

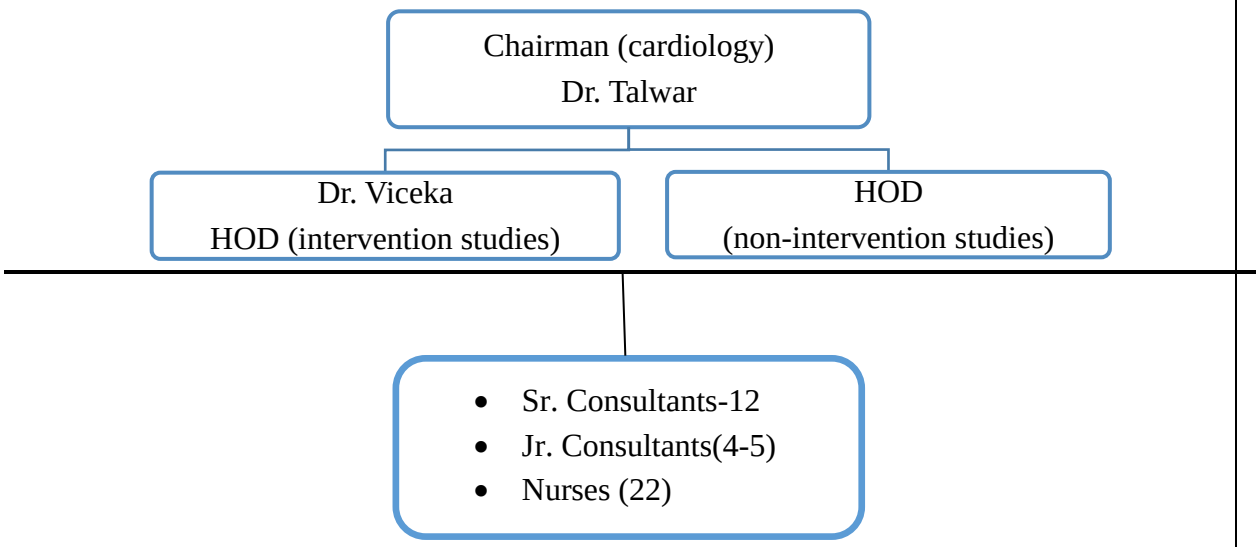
Location: Cath lab is located on the first floor with the vicinity areas as

- Emergency department
- Operation theatre
- Cath recovery-12 Beds
- Coronary care
- CTVS
- SICU
- PICU
- MICU

Process Flow of Patients


Admission to the floor
Transferred to cath lab as per slot booked
Angiography
Angioplasty
Discharged after keeping in observation
observation for 1-2 hours
recovery (for over a night)
Transferred to floor
Discharged

Staff


Chairman (cardiology)
Dr. Talwar
Dr. Viceka
HOD (intervention studies)
HOD
(non-intervention studies)
Sr. Consultants-12
Jr. Consultants(4-5)
Nurses (22)

DEPARTMENT OF LAB SERVICES

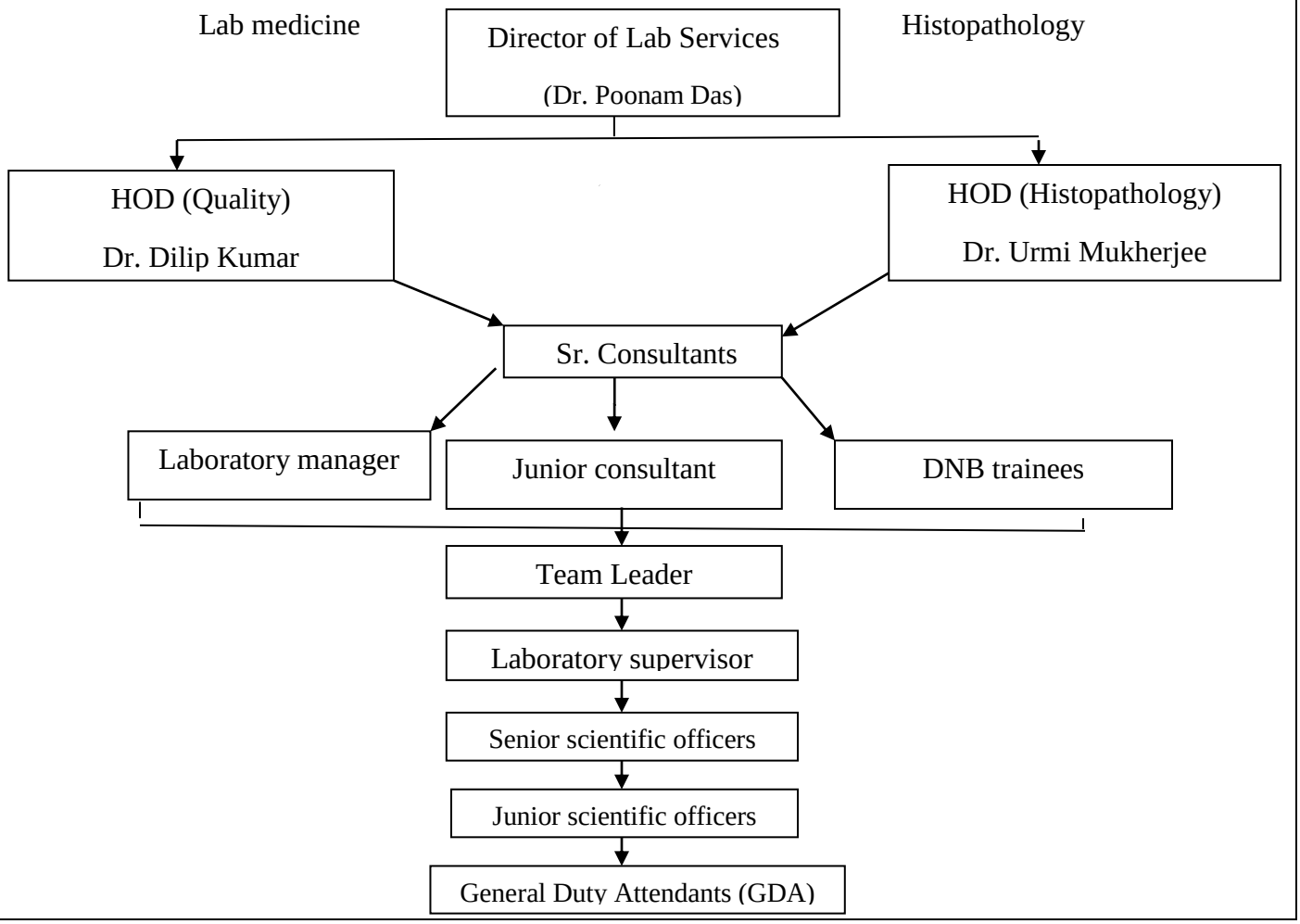
INTRODUCTION-

An ISO: 15189 certified and NABL accredited lab, it is open 24 hrs a day. It's a high-technology lab with fully automated equipments which are directly interlinked with ***hospital information system*** and ***laboratory information system***. Facility of stat tests (emergency) and sample collection from home is also available.

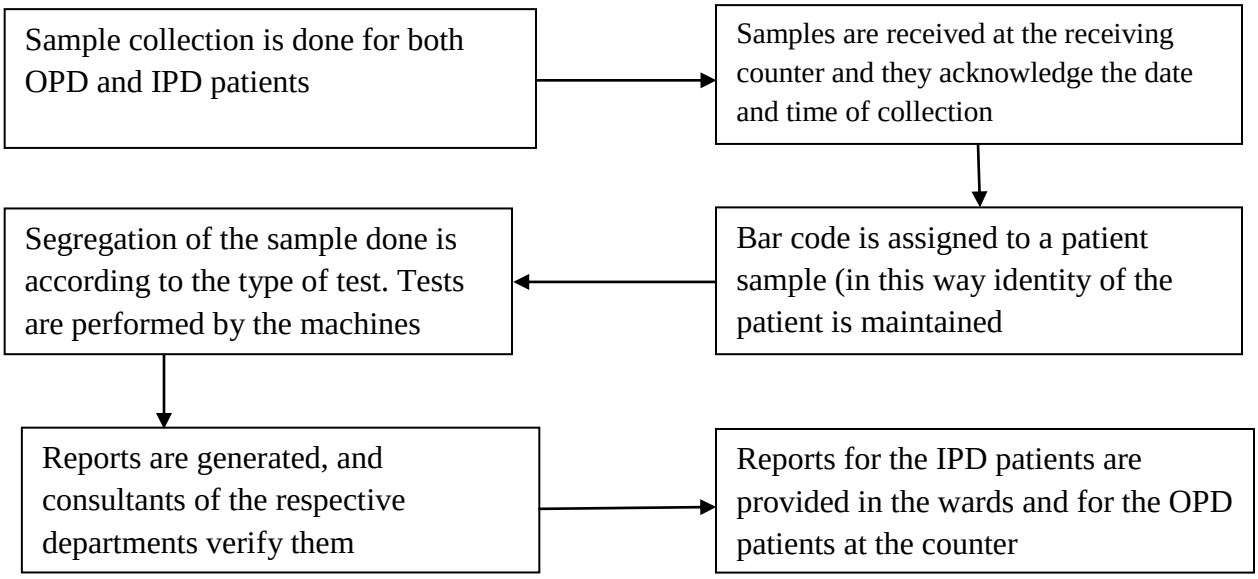
LABORATORY COMPRISES OF THE FOLLOWING DEPARTMENTS-

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

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



PROCESS FLOW-



LABORATORY INFORMATION SYSTEM- It is connected with hospital information system

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

- Indemnity Insurance- Insurance policy to protect employees when they are found to be at fault for a specific event such as misjudgment.

RADIOLOGY DEPARTMENT: -

- Situated at the ground floor of the west wing of the hospital.
- The Department id headed by Dr. Sonia Dhal
- The total staffs working in the Radiology Department are 60.

Procedures done in the department: -

(1) Routine X-Ray studies

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

(2) Routine ultrasound studies

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

3) Mammography

4) Dexa scan(Bone Densometry)

5) Special imaging techniques

(a) CT Scan (Computerized Axial Tomography)
(b) MRI (Magnetic Resonance Imaging) - 1.5 Tesla, 3 Tesla

Divided into two parts: -

1) For Ultrasonography, mammography, Dexa scan

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

Consist of: -

1) Reception: -Counter for appointment and billing

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

3) Diagnostic room

4) Counseling room

5) Changing room

6) Film processing room

7) Radiologist office

8) Report collection room

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

Timings for OPD patients: 8am to 8pm

In between this IPD and Emergency patients are also taken.

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

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

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

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

Process flow in radiology department (OPD)

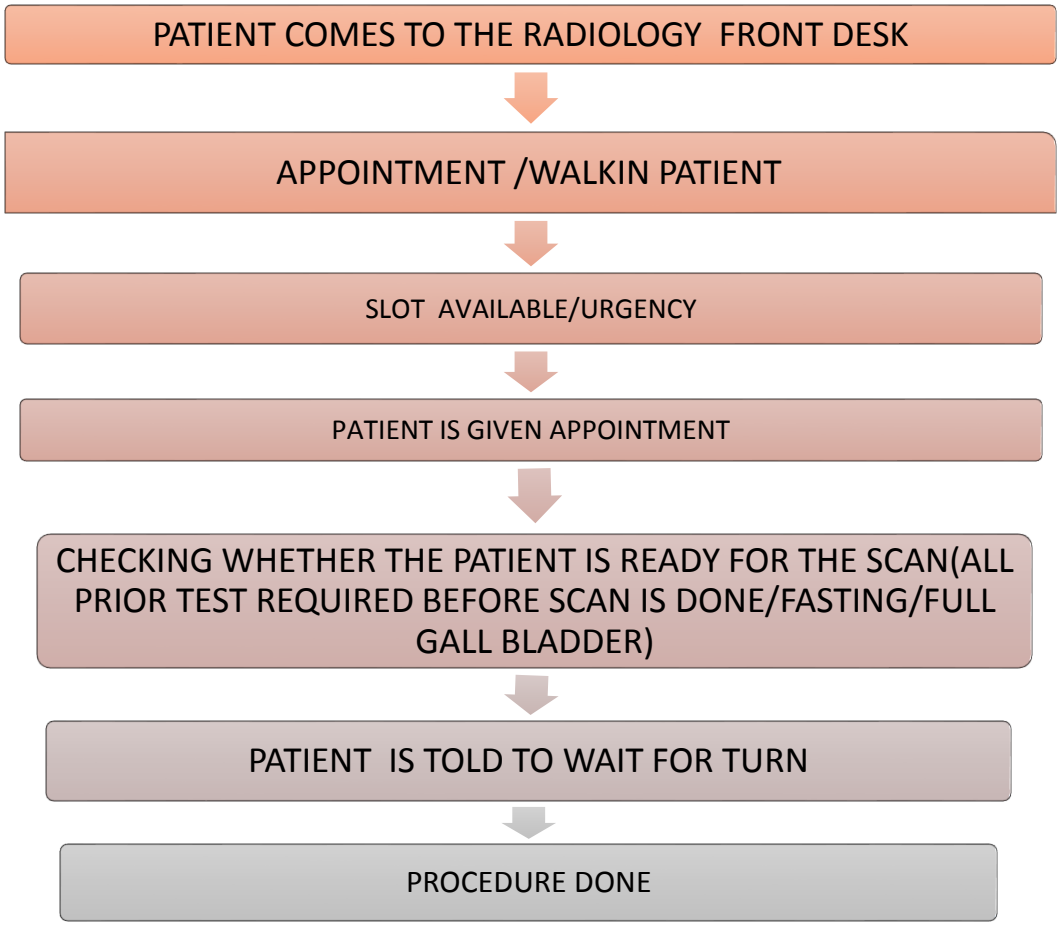


Figure: -Process flow in radiology department for outpatients.

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

Warning sign with Red light is on when the procedure is going on in the room.

- 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

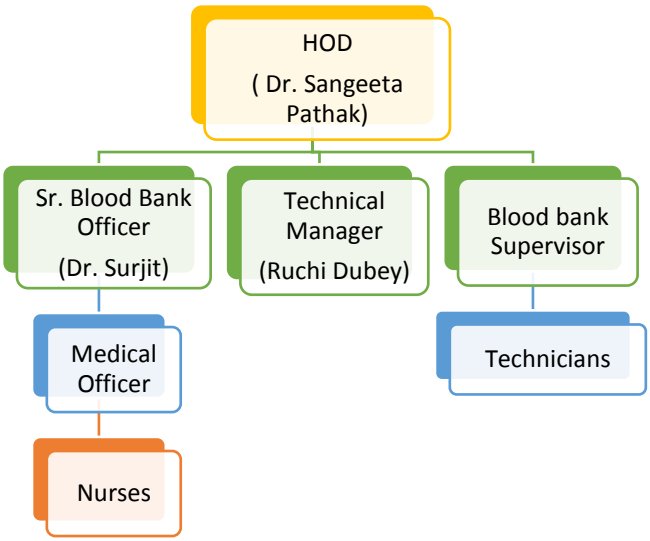
Max super specialty hospital has its own blood bank. All blood groups are available. It is mandatory for the in-patient attendants to donate blood or do replacement of the blood.

Blood bank consists of:

1. Sample collection area / reception area: In reception area a form is given to the attendant of the patient regarding their details before he/ she donates the blood.
2. Component room: In component room the whole blood is separated into packed cells (2-6^{o} C), FFP (-80^{o}C) and platelets (22^{o}C). Packed RBC can be stored for 42 days, Platelets for 5 days and FFP for 1 year.
3. 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.
4. Issue room: This room is to issue the screened blood bags.
5. Quarantine Area: The untested units are stored in this area for 1 day after component separation. This area is also for nucleic acid testing (NAT)
6. Serology Room- Patient and donor's blood processing is done in this area.
7. Refreshment Area- The donors are provided refreshment after donating blood in this area.

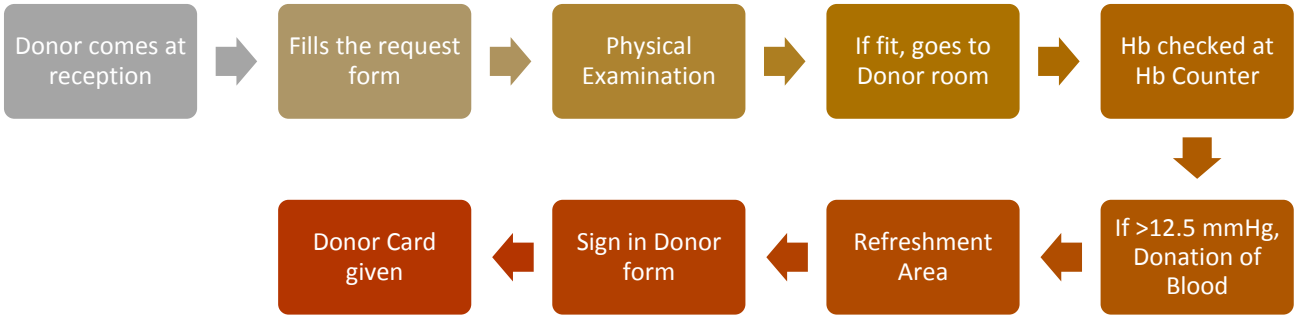
Staff of blood bank consists of 1 HOD, 2 blood bank officer, 1 technician supervisor, 16 technicians, 2 staff nurse, 2 computer executives, 4 GDA.

Hierarchy



- The blood donation timings are from 9am to 5pm. Blood can be donated after every 3 months.

Process Flow



- Voluntary Donor Card is valid for 1 year and Replacement Card is valid for 3 months.
- Record Maintenance – Both manually and digital (Acuren Software)
- Post-Donation Testing is done for and informed to all the donors.
- Report is given only to the patient, if patient cannot come, then the reports are emailed to them.

CENTRAL STERLIZATION SUPPLY DEPARTMENT

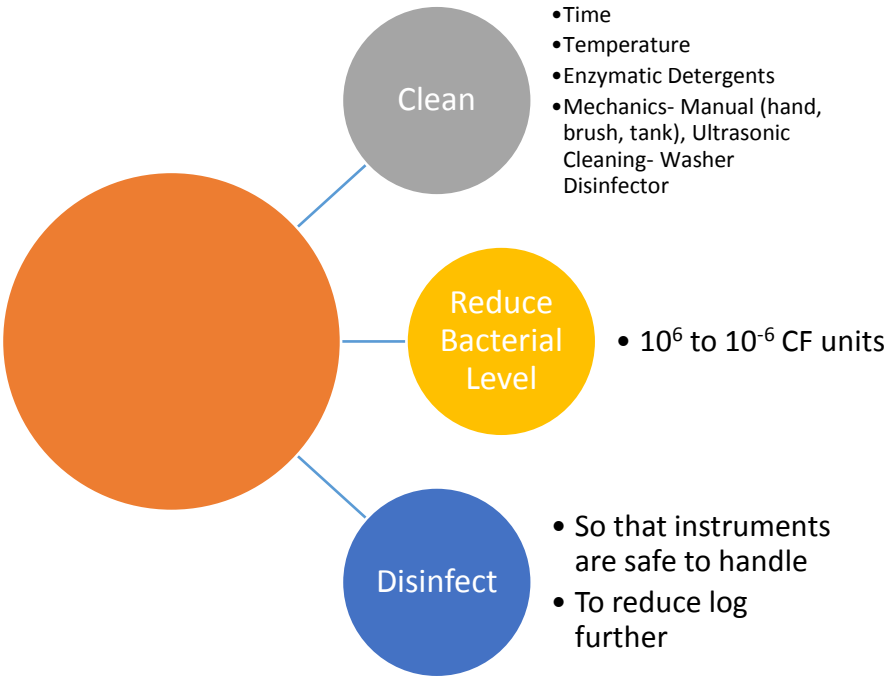
INTRODUCTION-

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}CF Units.

Objective of CSSD:

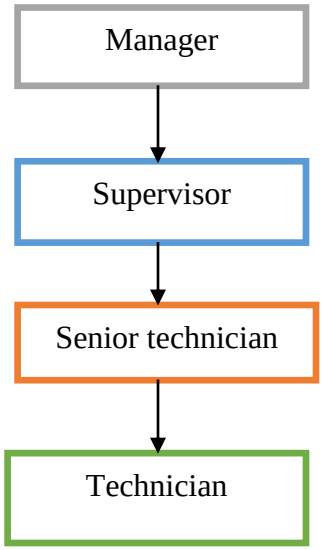


Types of Sterilization-

- Steam- uses saturated steam (heat + water) at 138^{o}C for 4minutes
- Ethylene Oxide
- Plasma

Size of CSSD- should be 10 sq feet per bed, for a 500-bedded hospital.

HIERARCHY OF THE DEPARTMENT-

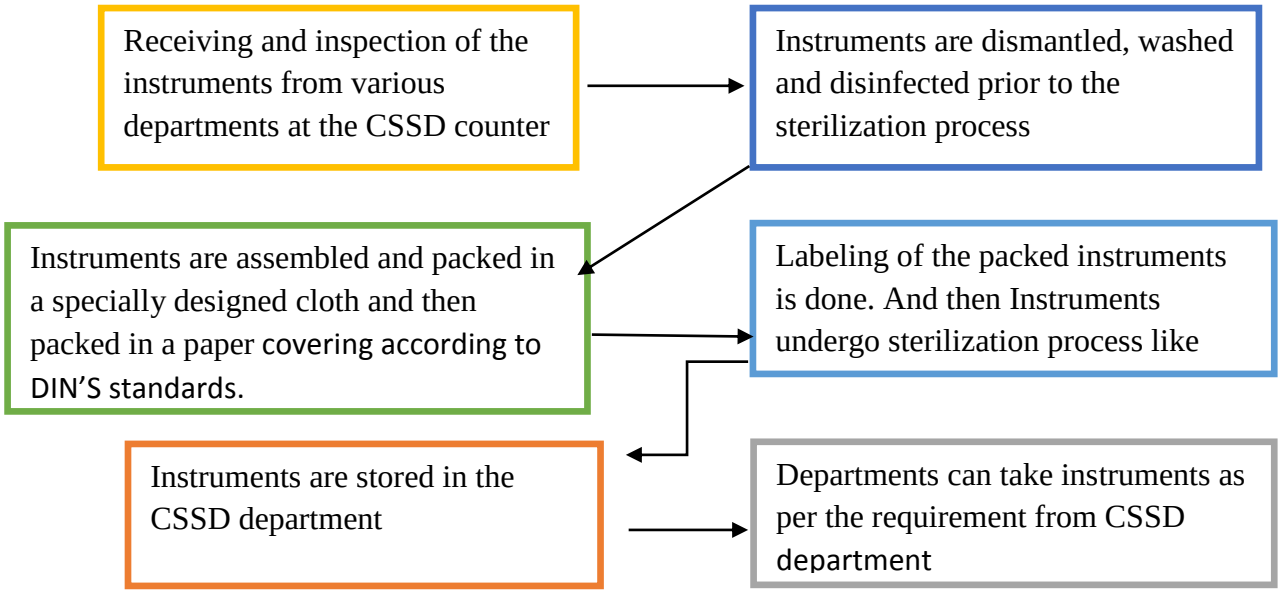


The Department is headed by Dr. Sanjeev Bhatia.

ZONES PRESENT (with color coding)-

- Decontamination Area
- Clean Zone — 18° to 22° C
- Sterile Zone- Temperature- 18° to 20° C

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 SMS (Stem-Mid-Stem bond) paper and cloths are used which are specifically designed for the purpose (they have a zig -zag pattern).
- Once sterilized and packed instrument can be used within 6 months.

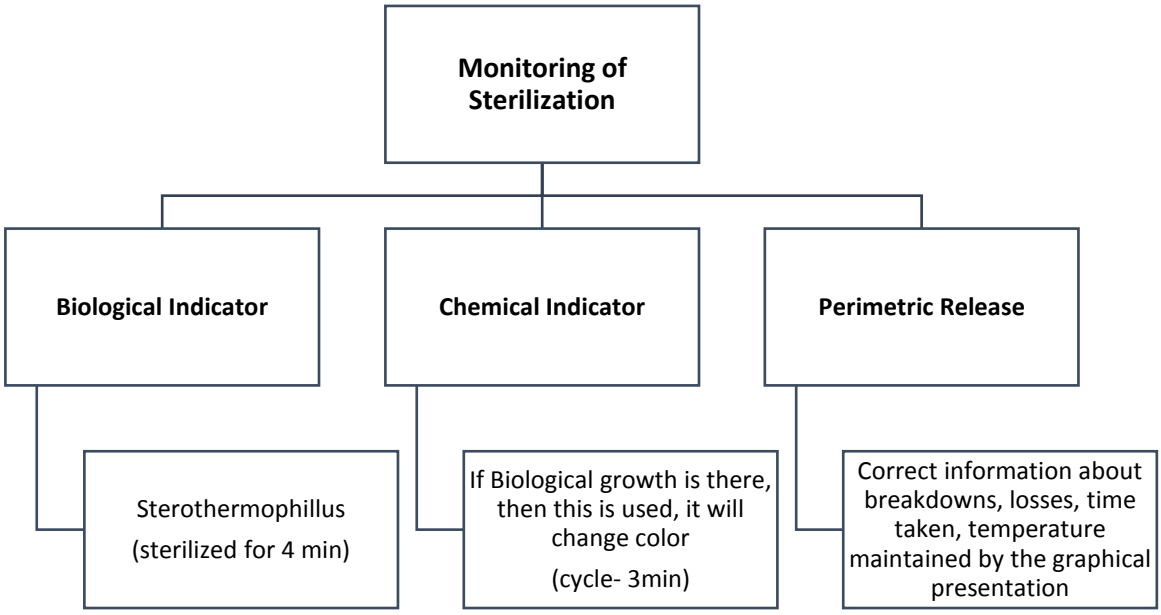
EQUIPMENT LIST-

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

QUALITY INDICATORS-

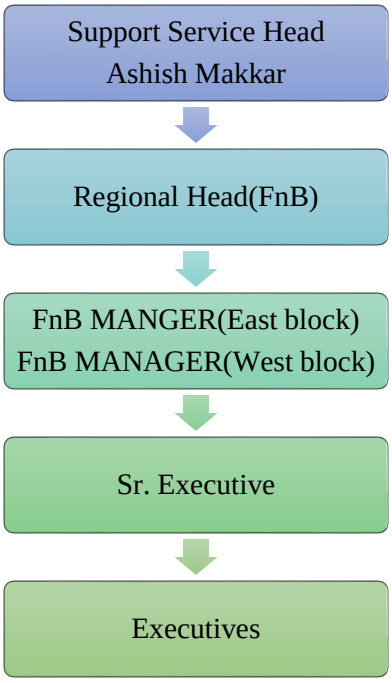
Various quality indicators used in CSSD are-

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



FOOD & 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.
- It is approved by NABH and works on ISO 9000: 2008.
- The department has been outsourced to Sodexo Pvt., ltd., however, the management and supervisory staff is in-house.
- Staff- 230 (outsourced) ; 11 (Max in house)
- Hierarchy



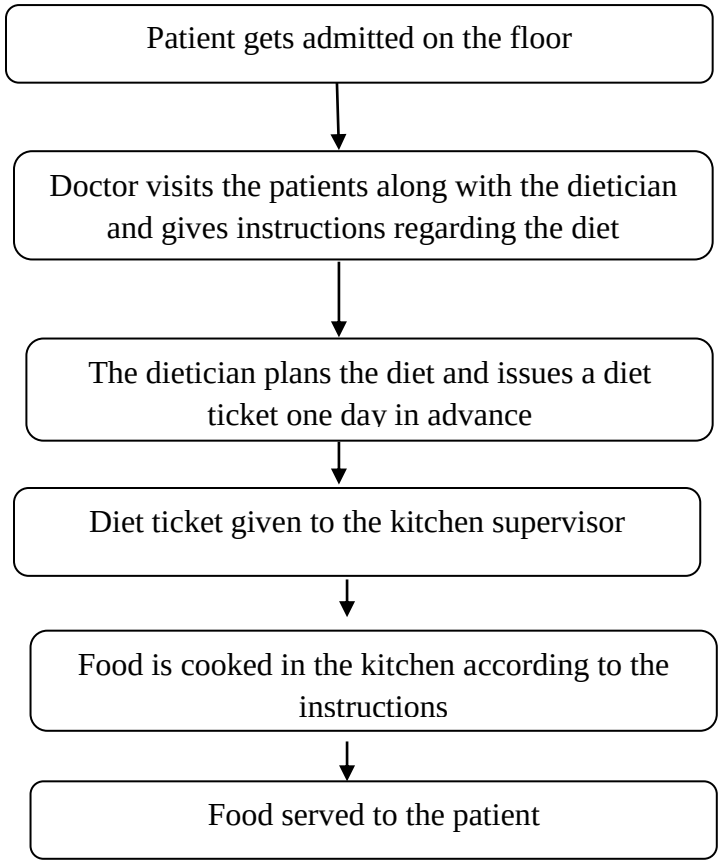
Time table for the diet of the patient: (7 meals/day)

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

- If the patient is on Liquid diet, it is provided every 2 hours, 10 liq. Diet/day.
- 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 want to have something extra, those can be provided to the patient after consulting dietician and calling on 4030 from their room, no 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

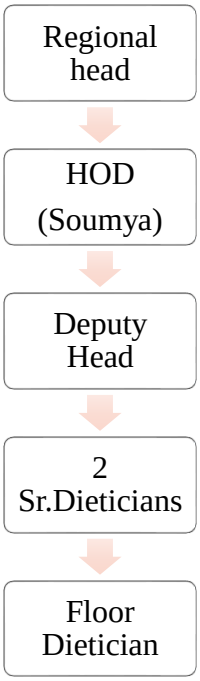


Quality Indicators for F n B department: Food Receiving, Food storage, Staffing

- The raw material is received everyday between 6:30-7am, washed and stored. The cutting is done on color coded chopping boards separately for Veg., Non-Veg. and Sea food.
- The food sample is tested for any infection every 15 days.

DIETETICS

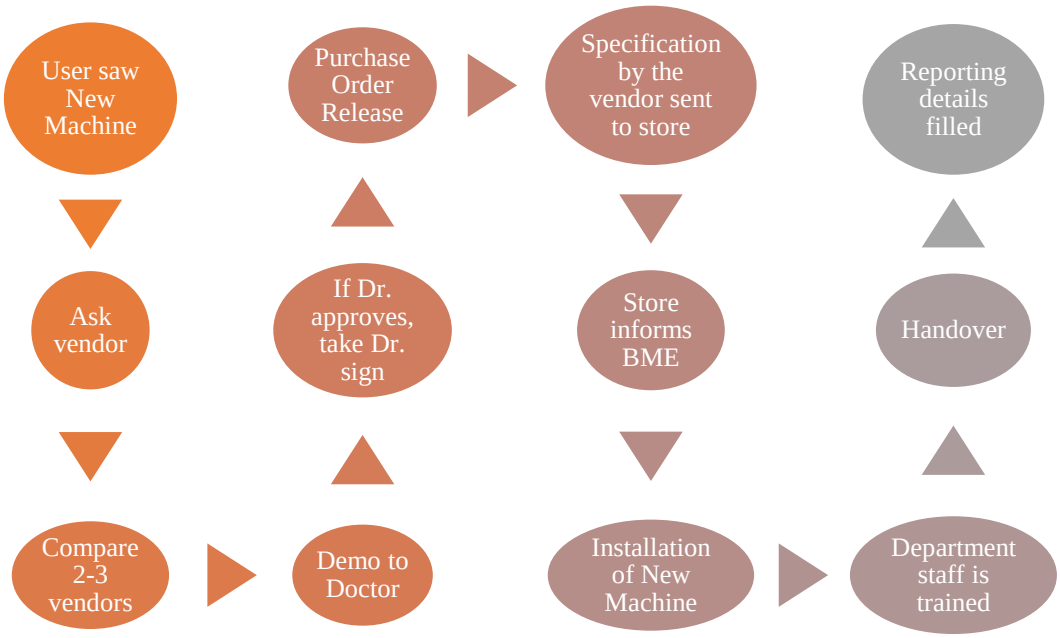
- The department plans diet for all IPD patients in accordance with the primary consultant's opinion on the same.
- Staff- 13 in total.
- Hierarchy



- Dietician: patient – 1:50
- Assessment of each patient to be done within 24 hours of admission and thereafter every 8th day after initial assessment.
- Scoring – Normal, Soft, Liquid Diet
- For enteral nutrition, all commercial supplements for each disease are available.
- Diet Note is put on CPRS on daily basis.

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 (PM) is done – to prevent breakdown, maintenance is done.
  - Calibration is done – i.e. to check how accurate an equipment is functioning There are white stickers on every machine that tells when the last PM and Calibration was done.
  - Breakdown call is checked for
  - Depreciation is measured
- For new equipment-
  - Installation and commissioning is done.

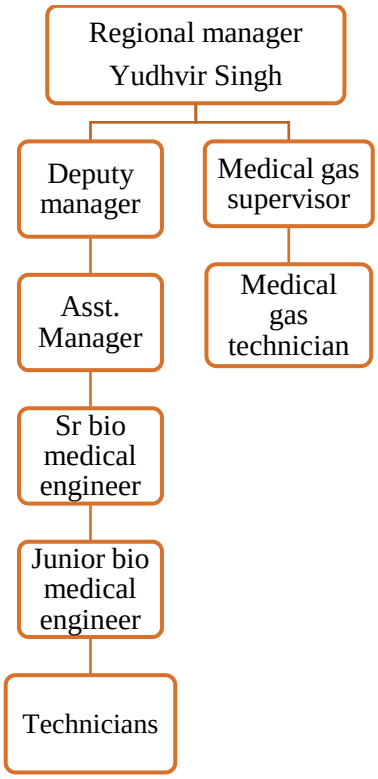


  - Criteria for Up gradation-
    i. The company supplying the equipment has been obsolete and BME recommends new machine
    ii. The staff suggests a new machine, BME checks the budget of the department, if budget allows, and then procedure for procurement is done.

- 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.

- Organizational chart



- Gas Manifold Department- Gas manifolds are also handled by this department and Max is awarded green OT certificate because of the efficient dispersion of OT gases. It maintains the supply of Oxygen, Air, Vacuum, Suction (-ve pressure).
- Compressors- in basement, for +ve and –ve pressure.

PHARMACY

Max pharmacy is self-owned with Central Pharmacy situated at corporate office, Okhla. There are 2 In-patient pharmacy stores, 2 Out-patient stores and 1 EWS pharmacy 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.

  A (mostly used drugs), B (Less used), C (Least Used)

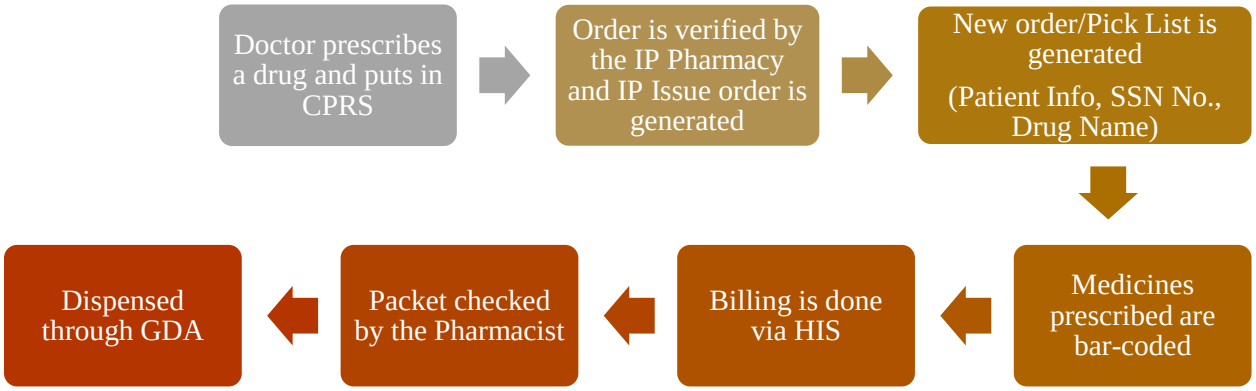
- Weekly requisition is done and vendors take minimum 3 days for delivery of drugs to hospital.

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-



The Stat orders required immediately are dispensed within 30 minutes. The Now order is dispensed within 1 hour and routine order (White color) is delivered by 1 round per day.

NARCOTICS DRUGS

They are in kept in double lock and key system with a label “High Alert Medicines”. 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 colored sound alike and pink colored 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.

Licenses 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)

Staff- In-patient pharmacy- 9 (Pharmacist) + 1 (Executive) + 8 GDA, 5 Data Entry Operator

Out-patient pharmacy-

CALL CENTRE (in-house)

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

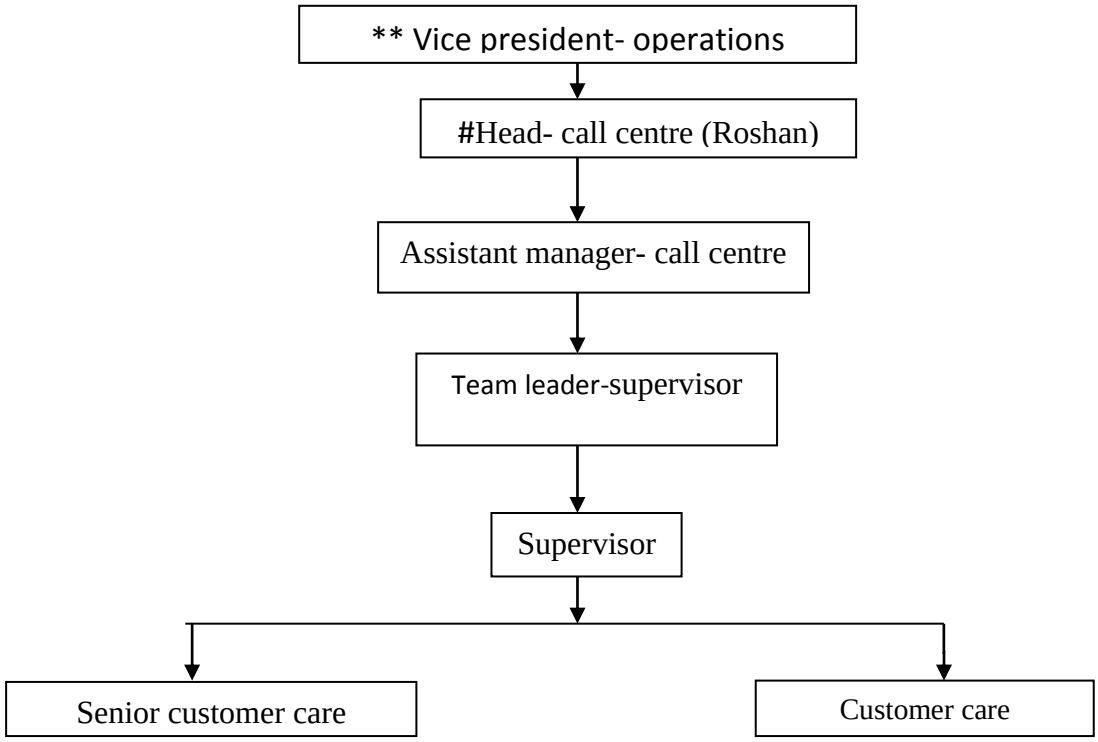
Call centre deals with:

- Doctor's appointment
- Health check ups
- Radiology and diagnostic appointments
- Patient's information

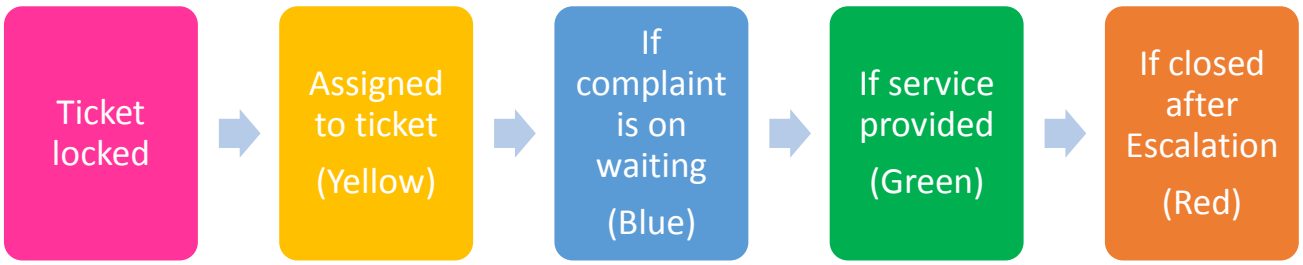
- Doctor's information
- Employee's information
- Specialty information
- Other department information
- In-patient requests, ext. no. 4000
- It handles internal emergency e.g. at ext. no. "11" -Blue code, RRT, Code Yellow, Code Pink, at ext. no. "14", Code Red, Code Black
  Main board line number is: 26525050

- Ambulance Services

Organization chart:



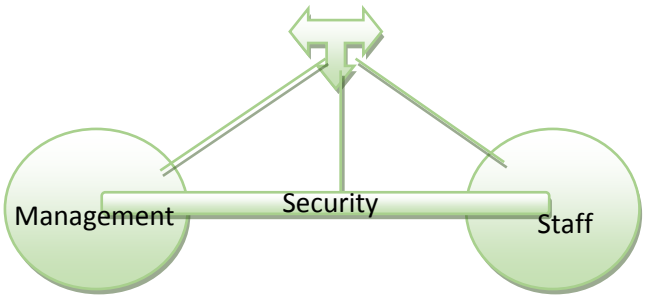
Ticket Process Flow



- If complaint is resolved, it closes automatically in 4 hours.

- Escalation Matrix- If any request is not fulfilled in appropriate time, this matrix enables a message on duty mobile of the department supervisor and so on, i.e. it escalates the unresolved issue to the higher authority concerned.
- All the HODs are messaged daily about the calls and the Turn Around Time (TAT) of the calls.

SECURITY DEPARTMENT



The security department is an eye and ear of every organization acting as a liaison between the 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- Frisking
- Turnout and grooming of security staff
- Death handling
- Training of security staff
- MLC handling- filling MLC intimation and re-intimation (if any) form
  Re-intimation is made when a MLC patient gets admitted again within 10 days of the discharge.
- Dispute handling

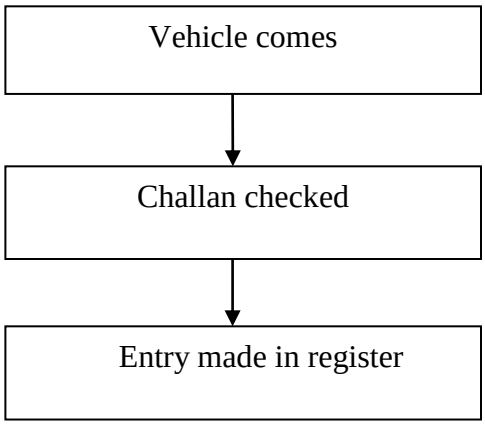
- There are 192 CCTV Cameras recording every action in the hospital premises.
- Two Teams- IRT (Initial Response Team) and ERT (Emergency Response Team)
- ERCC system- Emergency Response Coordination and Communication system sends a voice message (1000 messages on 1 go) on the duty mobile number in an emergency.
- Security divides the RRT in 4 teams to act in an emergency
  1. Action taking
  2. Rescue Team

3. Salvage Team- to remove important documents from that area.
4. Cordon off Team- to not to allow anybody inside the threat zone.

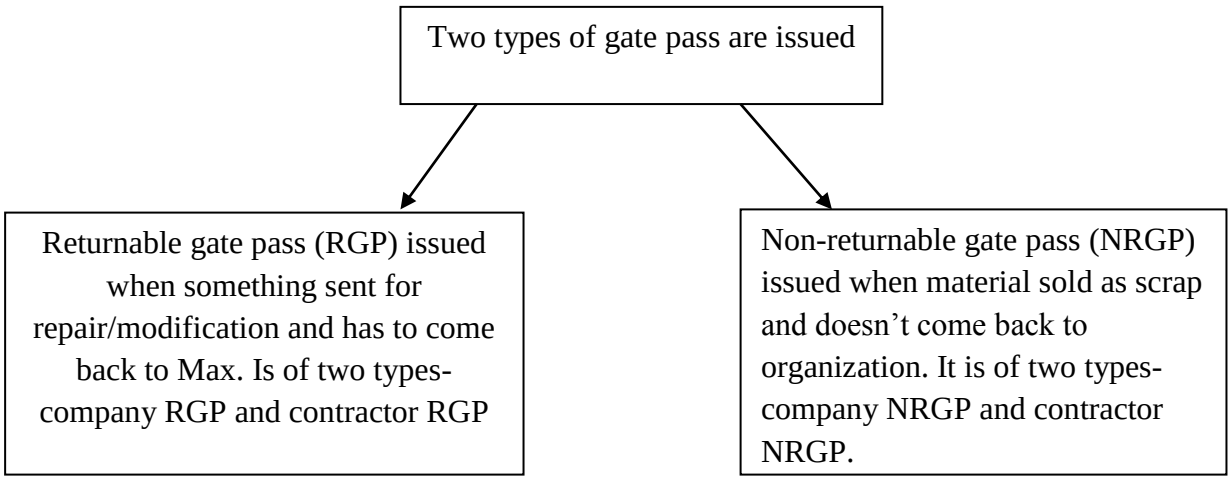
- If emergency occurs during an occupied OT, Security has put up a provision for OT to run for 45min on UPS, so basic stabilization of the patient can be done.
- There is a secret entry for the VIP security in the hospital.

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.

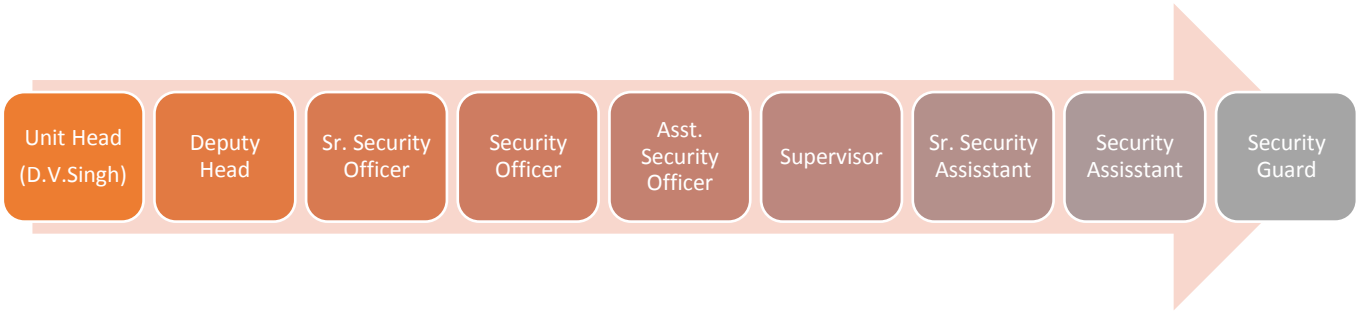
Other disasters include floods, water logging, terrorist attacks.

4. Valet management: -

- Helps internal and external customer 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.

Staffing

The Security department in Max Healthcare, Saket consists of 26 on- roll staff and 144 outsourced staff.



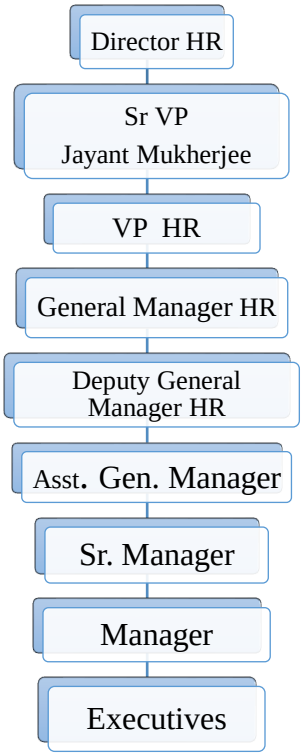
HUMAN RESOURCE MANAGEMENT

Core Values of HR : **Excellence, Credibility and Seva bhavna**

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 Hierarchy



Staff- Manpower of 15 staff is handling the HR system of Max Healthcare, Saket

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 Afghanistan, Iraq, African countries (Nigeria, Congo), Oman, Uzbekistan, Nepal, and Bangladesh.

Staffing:

Director Marketing

→ Regional Head

→ International – Country Head

→ Unit Head of Department

→ Asst. Manager → Senior Executives → Executive

CONCLUSIVE LEARNING

1. There is an information board on every nursing station which includes all the details of on-duty staff, is updated on daily basis.
2. Some of the Nursing station information board has Positive Thoughts (e.g. MAMBS recovery area, 2nd floor, East wing) and some have Good morning and smiling face smiley (e.g. 4th Oncology department)
3. The Emergency area is not designed within easiest reach, as it is not easily visible from the main entrance of the hospital.
4. The board depicting Emergency department does not has a good contrast background. "Emergency" is written with very light color on a bright background, difficult to read.
5. There are no directions in the hospital to reach Emergency department.
6. The Doctors feel very difficult to put notes in CPRS immediately, as they cannot find any system free. Some doctors also suggested of keeping Transcriptors for the same.

Thrombolysis in Stroke: Door to needle time and sources of in-hospital delay

CONTENT

ABBREVIATIONS

ABC	Airway Breathing Circulation
AHA	American Heart Association
AIS	Acute Ischemic Stroke
aPTT	Activated Partial Thrombolplastin Time
ASA	American Stroke Association
BP	Blood Pressure
CBC	Complete Blood Count
CNS	Central Nervous System
CPR	Cardio Pulmonary Resuscitation
CT	Computed Tomography
DBP	Diastolic Blood Pressure
DTN	Door To Needle
ECG	Electrocardiogram
ECT	Electoconvulsive therapy
EKG	Electrocardiogram
EMS	Emergency Medical Services
ESR	Erythrocyte Sedimentation Rate
FFP	Fresh Frozen Plasma
IA	Intra-Arterial

ICH	Intra Cranial Hemorrhage
ICP	Intra Cranial Pressure
ICU	Intensive Care Unit
INR	International Normalized Ratio
IV	Intra-Venous
LOE	Level Of Evidence
MCA	Middle Cerebellar Artery
MRI	Magnetic Resonance Imaging
NECT	Non Enhanced Computed Tomography
NIHSS	National Institute of Health Stroke Scale
NINDS	National Institute of Neurological Disorders and Stroke
OAC	Oral Anticoagulants
PT	Prothrombin Time
PTT	Partial Thromboplastin Time
rt-PA	Recombinant Tissue Plasminogen Activator
SBP	Systolic Blood Pressure
sPO2	Periphery capillary Oxygen Saturation
t-PA	Tissue Plasminogen Activator
TT	Thrombin Time

INTRODUCTION

A stroke is a result of reduced blow flow to brain which results in cell death resulting in altered brain functioning.. There are two types of strokes: ischemic stroke, which occurs due to lack of blood flow and hemorrhagic stroke , due to bleeding. They result in part of the brain not functioning.

Tissue-type plasminogen activator (tPA) is a commonly used intervention for acute ischemic stroke patients. The most important limiting factor for IVT administration is time because it has to be administered within 3-4.5 hours of symptoms onset of stroke. Clinical results are improved as a result of prompt tissue- type plasminogen activator delivery. Because of the significance of rapid treatment, national guidelines suggest that hospitals execute the clinical and digital evaluation of acute ischemic stroke patients and initiate intravenous tPA therapy within sixty minutes of patient's arrival in those without contraindications.

In spite of the proven benefits, patient and hospital characteristics, temporal trends, and outcomes of ischemic stroke with door-to needle times 60 minutes have not been well studied in India.

Despite of several efforts worldwide still percent age of patients with door-to-needle times within 60 minutes has only slightly increased over the last decade.

DNT is increasingly used by administrations as a measure of performance to review quality of care and to compare performances between hospitals. Meanwhile multiple studies and clinical trials are being initiated to examine explicit strategies to improve IVT. However, the emphasis should also be on what is known as best for these patients: reduction of the DNT. In contrast to stroke, in the majority of patients with acute myocardial infarction, fibrinolytic reperfusion can be applied with a DNT <30 minutes. It is hard to contend that for patients with acute ischemic stroke, the DNT is still more than twice as long. DNT provides valuable information in local trends and can serve as a performance guide to improve quality of care, not just by comparing results of one institution over time but also by comparison with other centres nationwide or internationally.

Hospitals are encountering growing burden to enhance the quality of care for stroke patients and decrease treatment delays. Providing tPA with less door-to-needle time involves a complex clinical process requiring coordination across departments and disciplines to effect timely triage, diagnosis, decision making, and treatment of a critically ill acute ischemic stroke patient. require A highly coordinated, multidimensional, focused effort will be required for successful organizational change in this complex clinical process.

This study aims to estimate the median door to needle time for acute ischemia stroke cases and to observe the reasons of intra hospital delay which causes delay in administration of the t-PA.

Since radiographic confirmation of acute ischemia stroke is crucial step to determine the treatment plan for the patients, Door to CT scan time is also an essential quality parameter that should be recorded and maintained. The non availability of the the data has acted as a limitation for the study.
Given below is the Stoke Protocol followed by Max Super Specialty Hospital, Saket, New Delhi which was designed according to American Heart Association guidelines,2015.

MHC - Stroke Protocol

Introduction:
On arrival of a suspected Stroke Patient, an immediate general assessment is performed by the Stroke team

Stroke Team Composition:

- Consultant Emergency Dept.
- Consultant Neurology on Call
- Consultant Interventional Neurology on Call
- Consultant Neuroradiology on Call
- Consultant Neurosurgery on Call

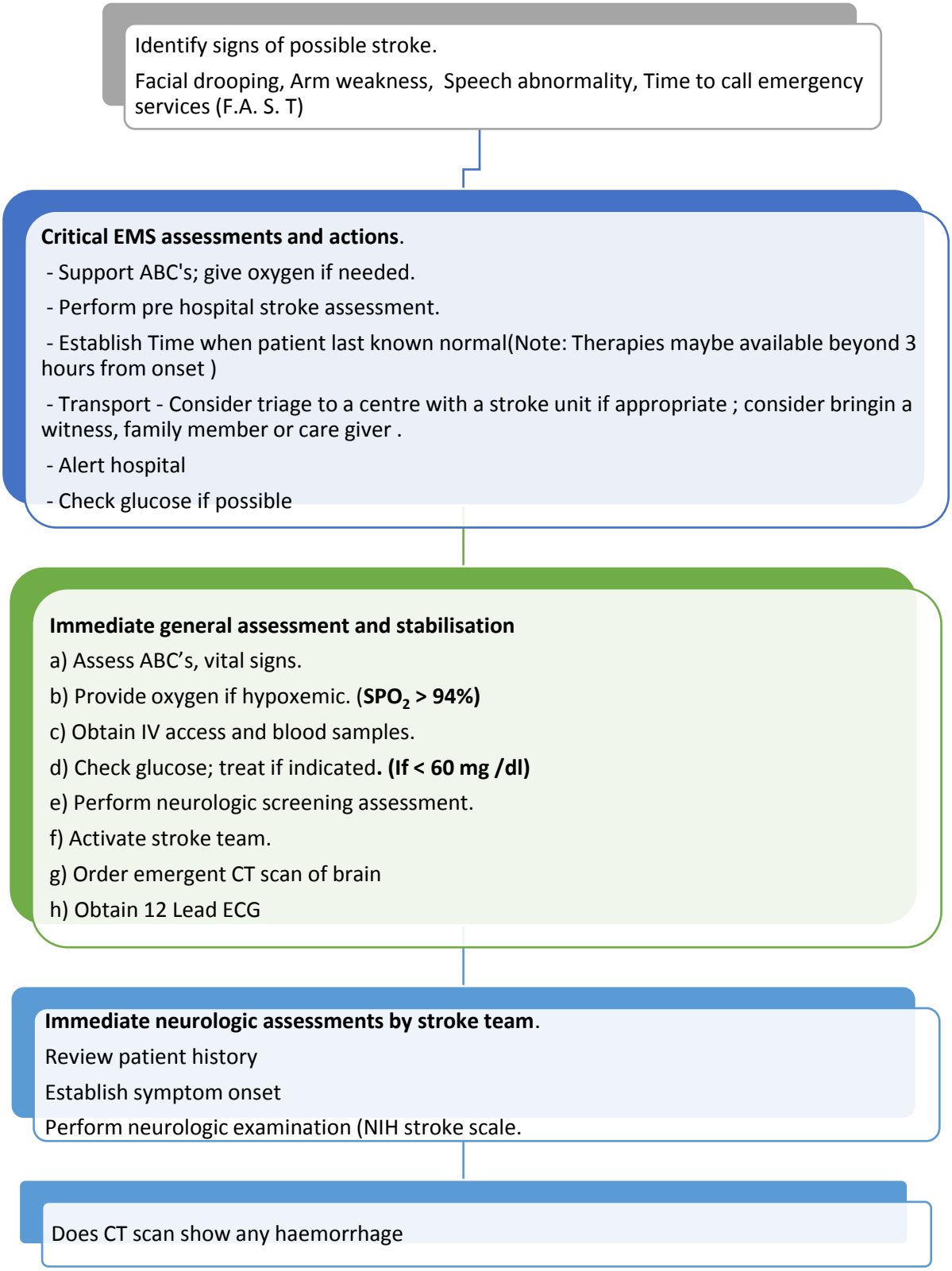
General assessment should be performed by the stroke team immediately on arrival of the patient. An order should be issued by the stroke team for an urgent CT scan/ MRI scan/ CT Angio. Interpretation of CT is to be done within 45 minutes of arrival in ED
Following this, decision confirming of diagnosis whether Ischemic or Hemorrhagic Stroke will be established, and Patient put on following Algorithmic steps.

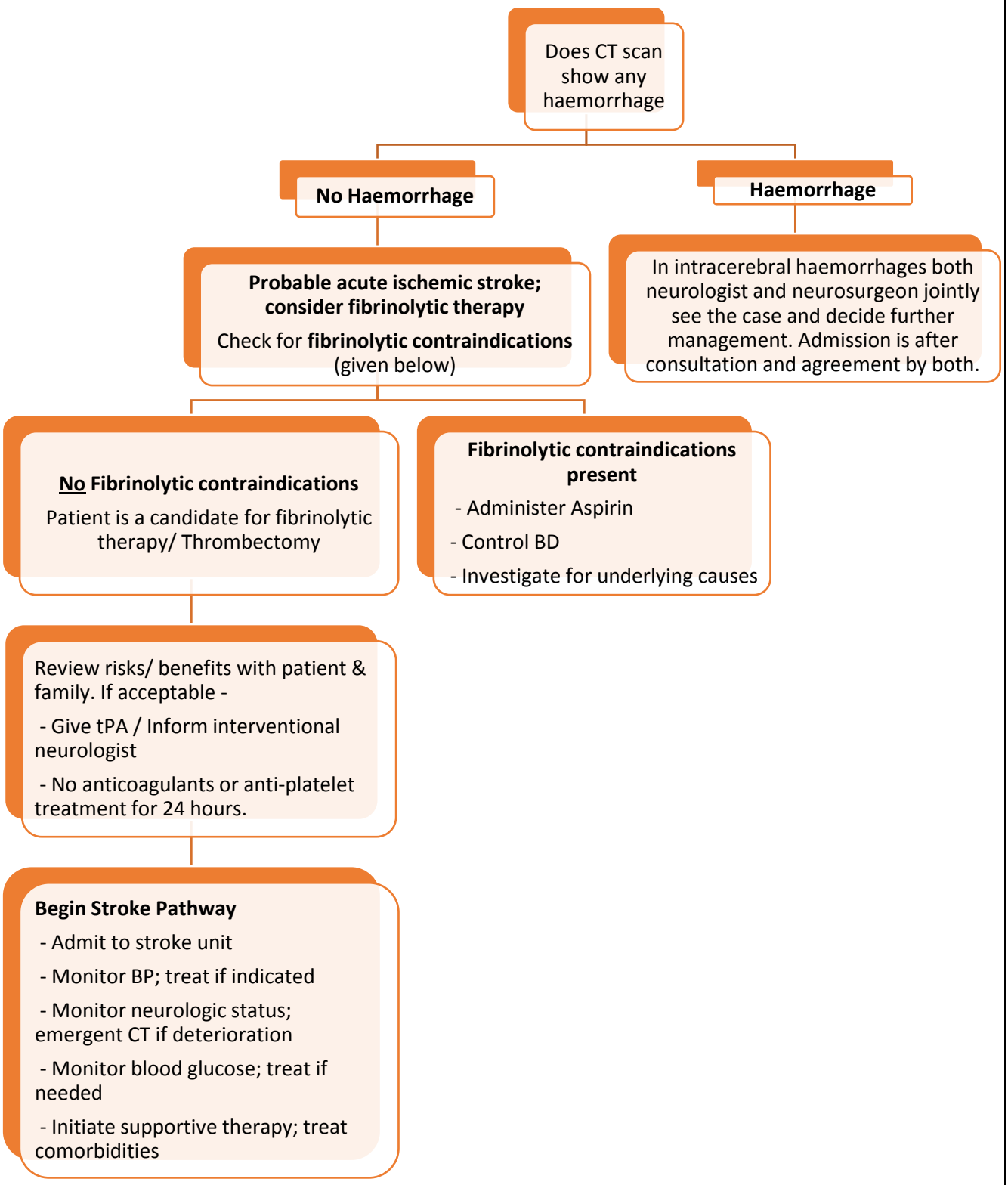
Management of Acute Ischemic Stroke will be followed as per following protocols.

On intimation or arrival of a case of Stroke, the following actions will be considered by the concerned group.

EVENT	TREATMENT	RESPONSIBILITY
Acute ischaemic infarction fulfils criterion for administration of IV rt-PA, onset within 4.5 hrs.	Thrombotic Therapy as per Protocol (Attached)/ Thrombolytic + Thrombectomy as required	Neurology and interventional neurology Team
Acute Ischaemic Infarction onset between 4.5 hrs and 6 hrs.	Bridge Therapy/ Thrombectomy as per attached Protocol.	Neurology + Interventional Neurology Team
Acute Ischemic Infarct, Large Intracranial Artery occlusion coming beyond 6 hrs of Onset and ineligible for rt-PA administration	Mechanical Embolus removal (case to case basis)	Neurology + Interventional Neurology team
Acute large ischaemic stroke Requiring Surgical Decompression	Surgical Decompression	Neurosurgery + Neurology Team

ISCHEMIC STROKE PROTOCOL




Does CT scan show any haemorrhage
No Haemorrhage
Haemorrhage
Probable acute ischemic stroke; consider fibrinolytic therapy
Check for fibrinolytic contraindications (given below)
In intracerebral haemorrhages both neurologist and neurosurgeon jointly see the case and decide further management. Admission is after consultation and agreement by both.
No Fibrinolytic contraindications
Patient is a candidate for fibrinolytic therapy/ Thrombectomy
Fibrinolytic contraindications present
- Administer Aspirin
- Control BD
- Investigate for underlying causes
Review risks/ benefits with patient & family. If acceptable -
- Give tPA / Inform interventional neurologist
- No anticoagulants or anti-platelet treatment for 24 hours.
Begin Stroke Pathway
- Admit to stroke unit
- Monitor BP; treat if indicated
- Monitor neurologic status; emergent CT if deterioration
- Monitor blood glucose; treat if needed
- Initiate supportive therapy; treat comorbidities

Imaging

- Brain Imaging should be interpreted within 45 minutes (or as fast as possible) of arrival on ED.
- Either NECT or MRI is recommended (as decided by the treating team) before IV rt-PA administration to Exclude ICH
- A Non-Invasive Intracranial Vascular Study is strongly recommended during initial imaging evaluation of acute stroke patient if either IA fibrinolysis or mechanical thrombectomy is contemplated for management but should not delay I/V tPA if indicated (Class I, LOE A).
- CT perfusion and MRI perfusion and Diffusion Imaging, including measures of Infarct Core and Penumbra may be considered for selecting patient for acute re-perfusion R_X beyond I/V fibrinolytic time windows. (Class II, LOEB)
- Patient with TIA should undergo Neuro-imaging Evaluation within 24 hrs of symptom onset or as soon as possible. In patients with delayed presentation (MRI > CT). (Class I, LOEB)

Protocol for Intravenous rt-PA for Acute Stroke

IV thrombolysis should be done at the earliest even in triage if not getting ICU bed. (Goal is Door-to-Needle time of 60 minutes)

Inclusion criteria:

- Acute ischemic brain infarction with onset, clearly defined, less than 4.5 hours. (Exclude all wake up Stroke)
- For otherwise medically eligible patients ≥18 years of age, intravenous alteplase administration within 3 hours is equally recommended for patients <80 and >80 years of age
- Intravenous alteplase treatment in the 3- to 4.5-hour time window is also recommended for those patients <80 years of age without a history of both diabetes mellitus and prior stroke, NIHSS score <25, not taking any OACs, and without imaging evidence of ischemic injury involving more than one third of the MCA territory

Absolute Exclusion Criteria:

- Hemorrhage on CT
- Known CNS vascular malformation or tumor
- Symptoms suspicious for subarachnoid hemorrhage
- Significant trauma within 3 months (includes CPR with chest compression within past 10 days)
- Stroke within 3 months

- Recent History of intracranial hemorrhage
- Recent intracranial or intraspinal surgery within two weeks
- Active internal bleeding
- Acute bleeding diathesis, including but not limited to Platelet count <100 000/mm3, Heparin received within 48 h resulting in abnormally elevated aPTT above the upper limit of normal, Current use of anticoagulant with INR >1.7 or PT >15 s, Current use of direct thrombin inhibitors or direct factor Xa inhibitors with elevated sensitive laboratory tests (eg, aPTT, INR, platelet count, ECT, TT, or appropriate factor Xa activity assays)
- SBP > 185 OR DBP > 110 mm Hg, despite basic measures to lower it acutely
- Blood glucose < 50 mg/dL
- Arterial puncture at a non-compressible site within past 7 days.
- CT demonstrates multilobar infarction (hypodensity >1/3 cerebral hemisphere)

Intravenous Thrombolytic Therapy:

- Dose: 0.9 mg/kg (maximum dose of 90 mg);
- Give 10% as bolus followed by the remaining 90% as continuous infusion over 60 minutes
    - Select dosage from: 1 vial of Actilyse (rt-PA) 100 mg or 2 vials Activase (rt-PA) 50 mg or one vial of 50 mg + 1 vial of 20 mg as per availability
    - 100 mg preservative free diluent for reconstitution supplied with rt-PA
    - 2 (60 cc) luer-lock syringe
    - 1 (10 ml) syringe, labeled "t-PA Bolus"
    - 2 (19 mg) needles
    - 1 needle-less needle
    - standard pump tubing
    - Intravenous infusion pump
    - 1 (100 ml) bag of sodium chloride (0.9% NS) labelled "t-PA Infusion dose"
    - alcohol wipes
    - 2 medication labels

Administration:

- Hand the t-PA bolus syringe to the stroke neurologist and together verify the bolus dose, discard dose and infusion rate.
- Verify potency of IV site and tubing connections.
- Verify that the non –invasive blood pressure cuff is attached to the other arm. Verify that all required blood work has been drawn and sent.
- Bolus dose is given IV push over 1minute. Infusion dose is given over 1hr.

- Document start time of infusion and name of stroke neurologist.
- At the end of infusion, inject 20 ml of normal saline into the bag and purge the pump to empty the line completely of t-PA.
- Document end time of infusion.
- Perform neurological assessments every 15 minutes during the alteplase infusion, every 30 minutes for the next 6 hours, and then hourly until 24 hours

Antiplatelets:

No antiplatelet therapy for 24 hrs after rt – PA (thrombolysis). Antiplatelets should be started once in CT head plain is negative for hemorrhage after 24 hours of thrombolysis.

Blood Sugar:

Blood sugar should be tightly controlled during 24 hrs of acute ischemic stroke. The recommendation is to keep B. sugar less than 140 mg %

Stroke is a prominent cause of severe disability. Recent medical intervention for ischemic strokes have little to no impact on neurologic recovery, but timely intravenous administration of tissue plasminogen activator (tPA) within the first hours of onset can significantly decrease disability. Even slight reductions in the time from emergency department arrival to tPA treatment (door-to-needle [DTN] time) drastically improve the prospect of favorable clinical result.Yet, despite practice guidelines recommending DTN time within 60 minutes10-12 and prominent quality enhancement efforts to reduce DTN time, 12 the times until tPA treatment inpatients with acute ischemic stroke remain suboptimal. To exclude the possibility of hemorrhagic stroke, brain imaging is a necessary first step in the process of tPA delivery. The time from hospital arrival to brain imaging (door-to imaging time [DIT]) is generally thought to be the main driver of DTN time. Guidelines recommend DIT within 25 minutes,10 and the Centers for Medicare and Medicaid Services require hospitals to report the time to imaging interpretation.[9]

"The benefits of intravenous tissue-type plasminogen activator (tPA) in acute ischemic stroke are time dependent, and guidelines recommend an arrival to treatment initiation (door-to-needle) time of 60 minutes."[1]

"The importance of treating ischemic stroke patients quickly has long been recognized, and the mantra "Time is brain", is now ubiquitous. Unfortunately, the thinking "We still have time in the treatment window…" is occurring too often during the acute stroke code. The treatment window from time of onset is 4.5 hours in most guidelines, yet there is declining benefit as time elapses. A 1997 National Institute of Neurological Disorders and Stroke (NINDS) Symposium and the subsequent Brain Attack Coalition6 set the standard of 60 minute door-to-needle time."[5]

"Tissue-type plasminogen activator (tPA) is a proven intervention for acute ischemic stroke patients, with a Class I, evidence-based recommendation from the American Heart Association/American Stroke Association (AHA/ASA). The benefit of intravenous tPA in acute ischemic stroke is strongly time-dependent. Analyses of pooled data from large randomized intravenous tPA trials have shown greater neurological improvement at 90 days with early Tpa

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[1] [9] Hospital Variation in Thrombolysis TimesAmong Patients With Acute Ischemic StrokeThe Contributions of Door-to-Imaging Time and Imaging-to-Needle Time.

treatment. The therapeutic benefit of tPA is greatest when given early after ischemic stroke onset and declines with time, such that there is no significant benefit after 4.5 hours.Because of the importance of rapid treatment, national guidelines recommend that hospitals complete the clinical and imaging evaluation of acute ischemic stroke patients and initiate intravenous tPA therapy within 60 minutes of patient arrival in those without contraindication.However, fewer than one third of acute ischemic stroke patients who receive tPA are treated within guideline-recommended door-to-needle times."[3]

"Because treatment effects decline rapidly with the time passed after symptom onset, early administration of rtPA is a major challenge."[2]

"Besides its use as a performance measure, an additional advantage of a uniform DNT registration is facilitation of future research aiming to improve the DNT. In addition to the DNT, the proportion of patients treated with IVT can also serve as an important performance measure."[7]

"Many stroke patients eligible for thrombolysis were not treated appropriately because of delayed presentation to the hospital or delayed examinations and management in the hospital. Although delays are mainly caused by patients themselves , it should be possible to minimize the in-hospital delay. According to the recommendations made by the National Institute of Neurological Disorders and Stroke, a patient with AIS should receive rtPA within 60 minutes of arrival at the emergency department (ED) . A pilot study to address the quality of acute stroke care in 4 states of the US found that less than 20% of the patients treated with intravenous rtPA received it within 60 minutes of arrival ".[10]

"The major contributors to lengthened door to needle times included delays
in emergency room (ER) stroke triage and scanning."[8]

"According to previous reports, a considerable percentage of patients within 3 h after ischaemic onset did not receive iv t-PA . Delays in the identification of stroke patients who were eligible for iv t-PA might have caused lower rates of iv t-PA use than expected . However, our hotline system notified our stroke team when a patient who was dispatched would need iv t-PA, and this enabled us to decrease time delays in the identification of iv t-PA candidates at the ER."[6]

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[1] Timeliness of Tissue-Type Plasminogen Activator Therapy in Acute Ischemic Stroke Patient Characteristics, Hospital Factors, and Outcomes Associated With Door-to-Needle Times Within 60 Minutes.

[5] . Good is not Good Enough: The Benchmark Stroke Door-to-Needle Time Should be 30 Minutes Kamal, Noreen, Oscar Benavente, Karl Boyle, Brian Buck, Ken Butcher, Leanne K. Casaubon,
Robert Côté, Andrew M Demchuk, Yan Deschaintre, Dar Dowlatshahi, Gordon J,et al.

[1]

"A pre-hospital notification system might be a helpful aid for reducing intra hospital processing for iv t-PA, but should be implemented in the context of efficient rescue systems outside the hospital, which would ultimately help to improve clinical outcomes after iv t-PA use in AIS from the viewpoint of public health." [6]

"Recognizing that locating brain imaging within the emergency department might be particularly challenging for some hospitals, Target: Stroke did not include this strategy as a core strategy, despite its association with shorter door-to-needle times.20 Other strategies, such as having a stroke neurologist in the hospital at all times, are potentially costly and complex to implement, and therefore they were not incorporated into the core recommendations of the campaign,
even though this strategy in particular may be associated with faster door-to-needle times." [3]

"Although there have been concerns that attempting to achieve shorter door-to-needle times may lead to rushed assessments, inappropriate patient selection, dosing errors, and greater likelihood of complications, our findings suggest that more rapid reperfusion therapy in acute ischemic stroke is feasible and, importantly, can be achieved not only without increasing rates of symptomatic intracranial hemorrhage, but with actual reductions in complications.
Prior experiences of hospitals successful in improving the quality of cardiovascular care suggests that improvement is most effective when integrated into an environment that includes explicit goals; collaborative, interdisciplinary teams; a patient focused organizational culture; engaged clinical leaders and senior management; and detailed data feedback." [4]

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[1] [3] Improving Door-to-Needle Times in Acute Ischemic Stroke The Design and Rationale for the American Heart Association/American Stroke Association's Target: Stroke Initiative.

[2] Stroke Thrombolysis: Having More Time Translates Into Delayed Therapy Data From the Austrian Stroke Unit Registry

[7] Door-to-Needle Time and the Proportion of Patients Receiving Intravenous Thrombolysis in Acute Ischemic Stroke

[10] A Parallel Thrombolysis Protocol with Nurse Practitioners As Coordinators Minimized Door-to-Needle Time for Acute Ischemic Stroke.

[8] Reduction in IV t-PA Door to Needle Times Using an Acute Stroke Triage.

[6] Pre-hospital notification reduced the door-to-needle time for iv t-PA in acute ischaemic stroke

[3] Improving Door-to-Needle Times in Acute Ischemic Stroke The Design and Rationale for the American Heart Association/American Stroke Association's Target: Stroke Initiative.

[4] Door-to-Needle Times for Tissue Plasminogen Activator Administration and Clinical Outcomes in Acute Ischemic Stroke Before and After a Quality Improvement Initiative.

PROBLEM STATEMENT:

The timely administration of the thrombolytic agent, t-PA, is a proven treatment modality which improves the treatment outcome in stroke patients. There is no doubt that if door to needle time, which is an important quality measure for stroke patient's care, is maintained within sixty minute the quality of treatment and care improves drastically. Even though this is a fact, still there was modest increase in the number of cases with short door to needle time in previous decade.

PROBLEM JUSTIFICATION:

This report is intended to estimate the time taken for a patient to receive Intravenous injection of tissue plasminogen activator (tPA) which may improve the clinical outcomes drastically in an acute ischemic stroke patient, using Door to Needle (DTN) time as the performance indicator.

This study will also present the observations related to sources and reasons for in-hospital delay in the administration of tissue plasminogen activator. Most studies focus on efficacy of tissue plasminogen activator from medical view point, but from the administrative point of view continuous monitoring and reduction of door to needle time will improve clinical outcomes and quality of patient care in a hospital. Maintaining records of door to needle time and tracking down the time sources of in-hospital delay causes and sources is seldom done in developing countries like India.

RESEARCH QUESTION:

What is the door to needle time taken in acute ischemic stroke patients for thrombolysis and what are the reasons and sources for in-hospital delay in this process?

OBJECTIVES:

General objectives:

To study the door to needle time in patients with acute ischemic stroke and sources of in-hospital delay in the hospital.

Specific Objectives:

1. To estimate the door to needle time in patients eligible for administration of tissue plasminogen activator in acute ischemic stroke.
2. To observe the sources and reasons for in- hospital delay in the procedure of administration of tissue plasminogen activator.
3. To give recommendations for further improvement in the process.

RESEARCH METHODOLOGY

Type of study:
Descriptive

Target population:
Cohort of patients with acute ischemic stroke eligible for thrombolysis

Study location:
Emergency Department, Ground floor, East wing, Max Super Specialty Hospital, Saket, New Delhi.

Duration of study:
3 weeks (May 1,2017- May 21,2017)

Technique:
Direct Observation of the Process using Hospital checklist and In-depth interview of the medical staff.

Data collection:
Primary data collection (observation and interviews) and secondary data collection (review of past data of January2017 – April 2017)

Data entry:
Manual

Data analysis:
Microsoft Excel

DATA ANALYSIS AND INTERPRETATION

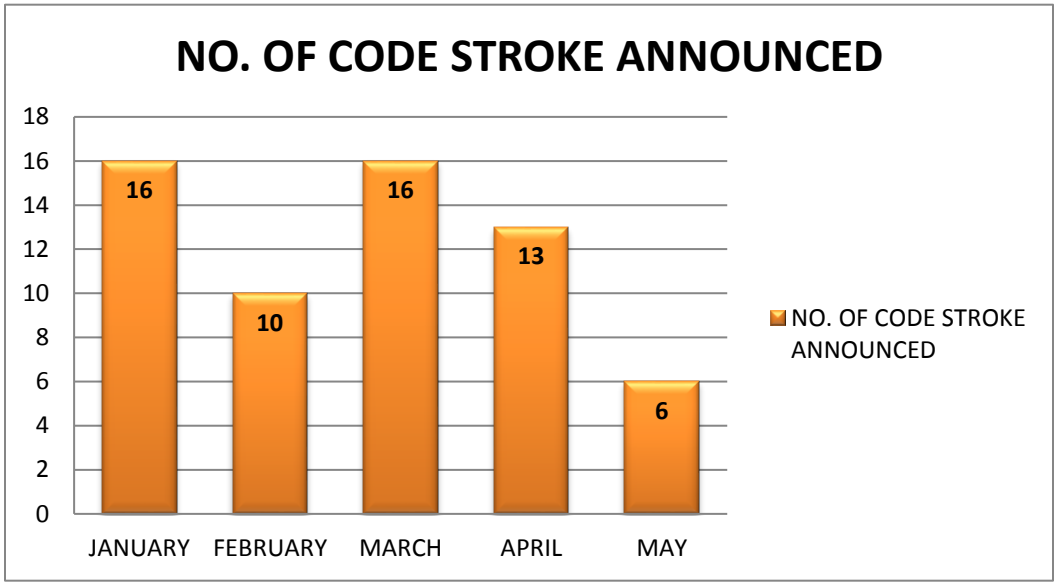

Fig. No.1: Figure depicts the number of Code Stroke announced from January 1,2017- May 21, 2017 in the hospital. In the month of January code stroke was announced 16 times, similarly in February-10, March-16, April-13 and in the month of May (till 21st May) code stroke announced 5 times.

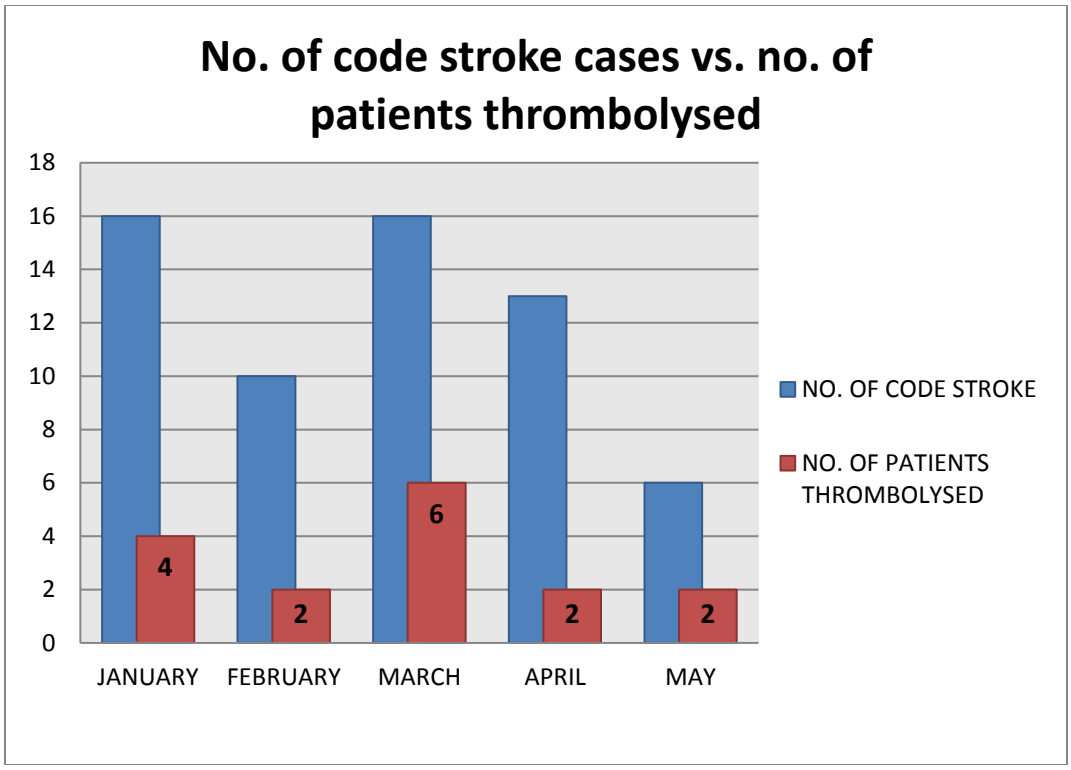

Fig. No.2: Figure reveals that out of 16 patients who were diagnosed with acute ischemic stroke, 4 patients were thrombolysed, in february out of10 patients 2 were thrombolysed, in March out of 7 patients 6 were thrombolysed, in April both the patients were thrombolysed, and in May (till May 21, 2017)2 were thrombolysed out Of 10 patients.

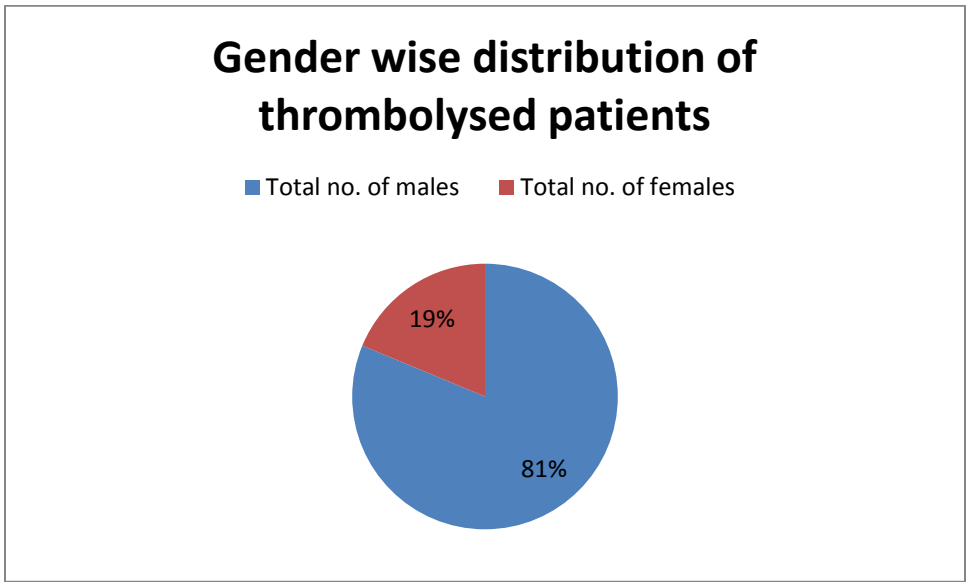

Fig no. 3: Figure shows that out of 16 patients who were thrombolysed from January to May (21st May), 81% patients were male and 19% were female.

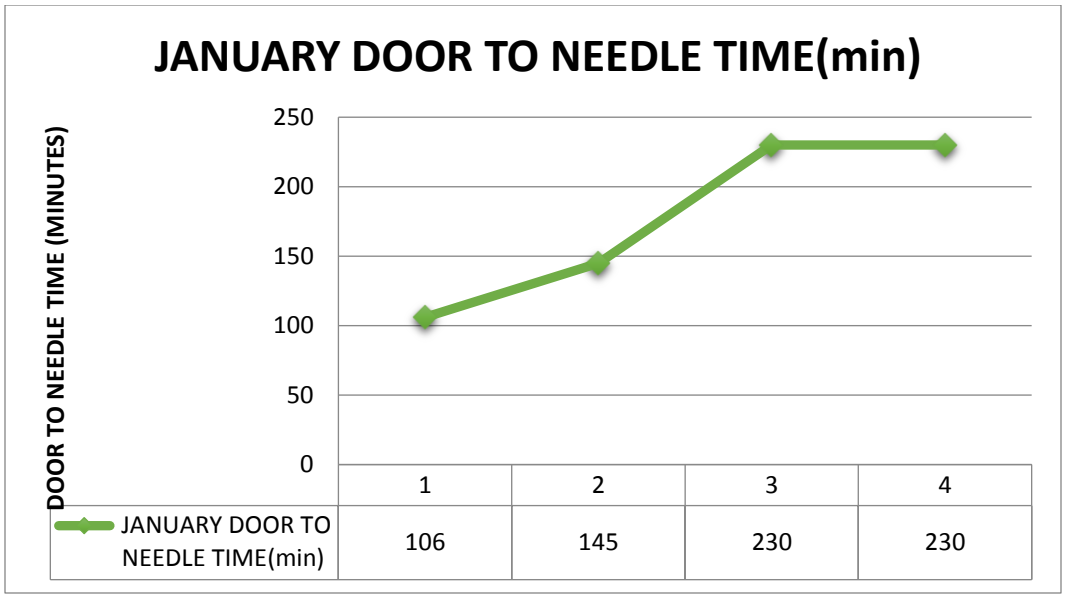

Fig. no. 3: Figure shows the door to needle time recorded in four patients who were thrombolysed in the month of January,2017.

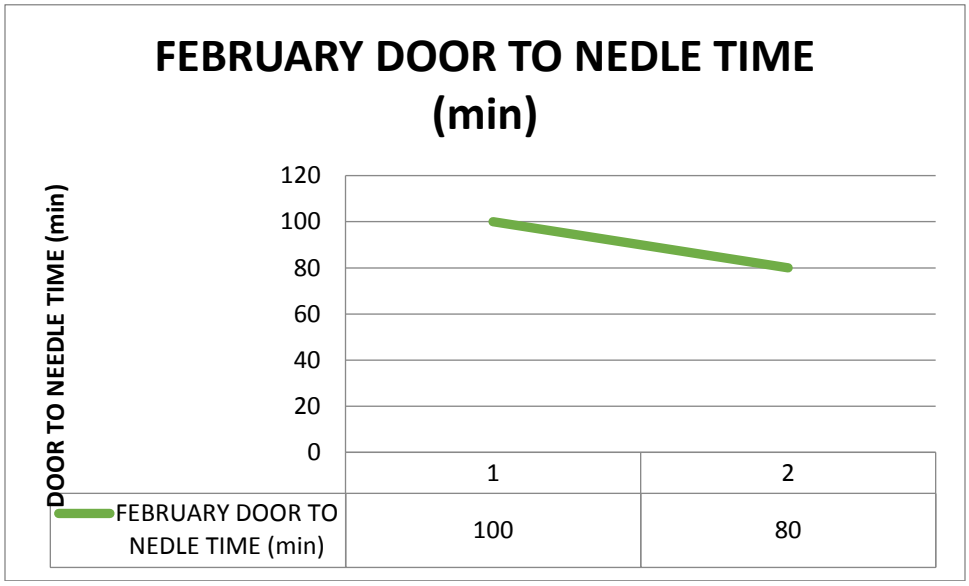

Fig. no. 4: Figure shows the door to needle time recorded in two patients who were thrombolysed in the month of February, 2017.

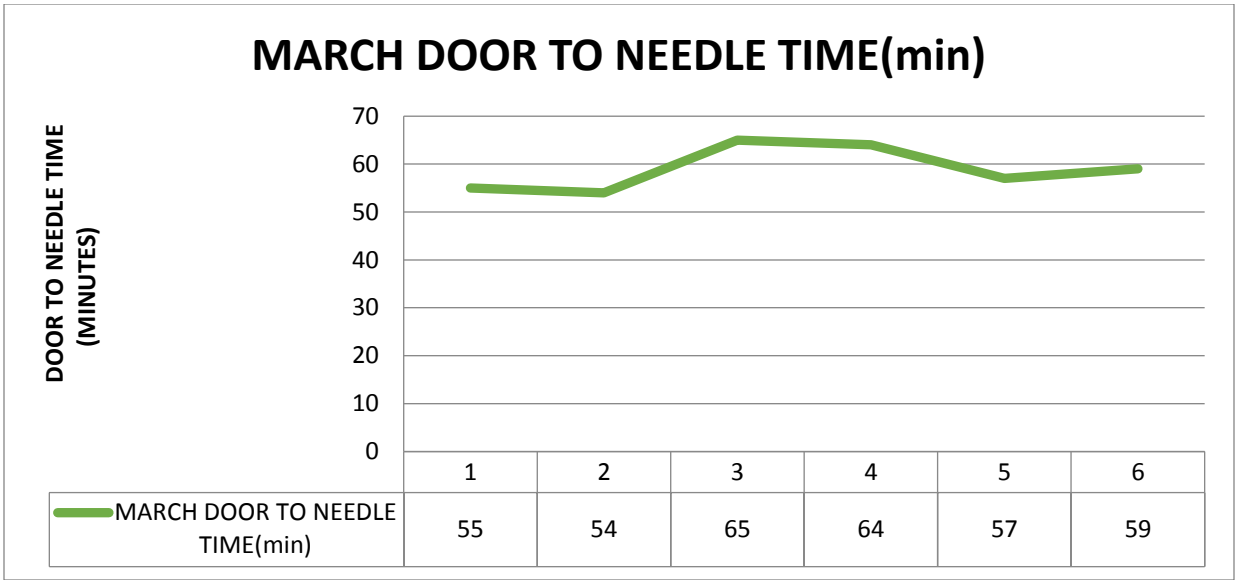

Fig. No.5: Figure shows the door to needle time recorded in six patients who were thrombolysed
in the month of March, 2017.

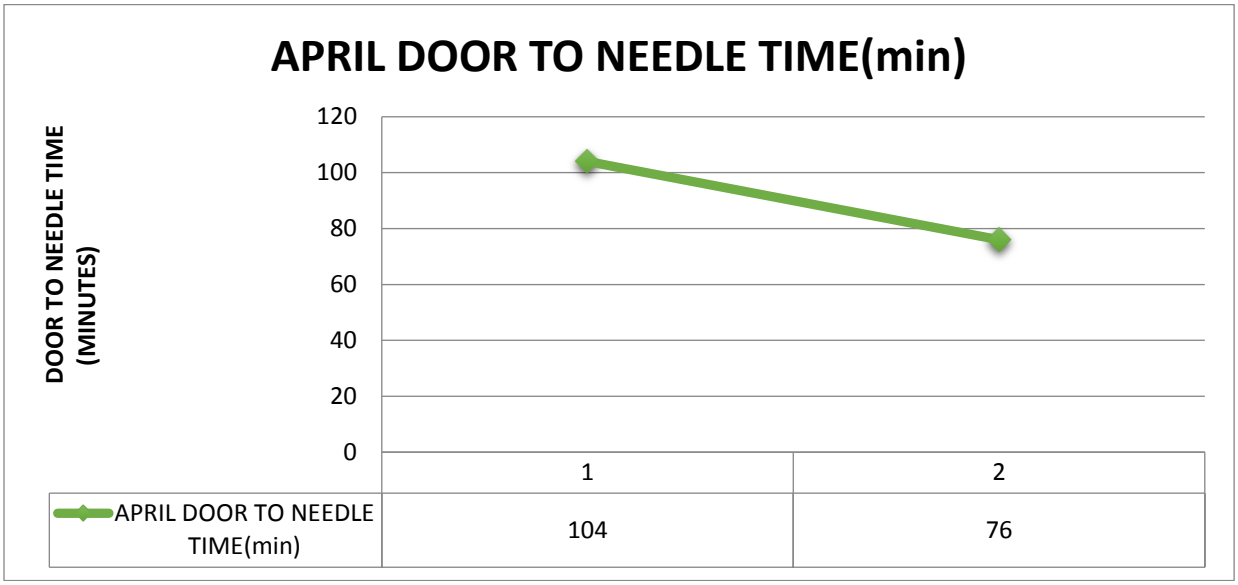

Fig. No.6: Figure shows the door to needle time in both the patients who were thrombolysed in the month of April.

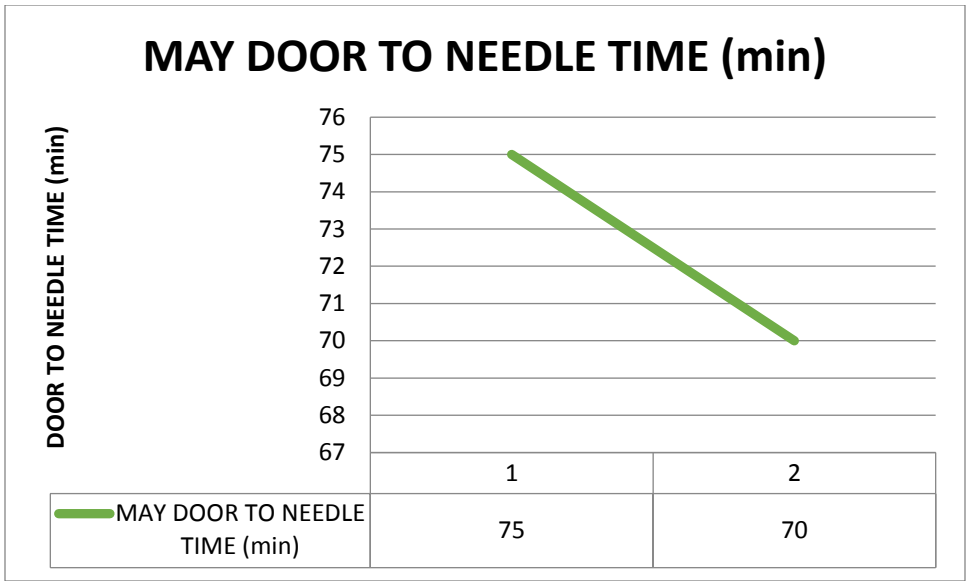

Fig. No. 7: Figure shows the door to needle time in both the patients who were thrombolysed in the month of May.

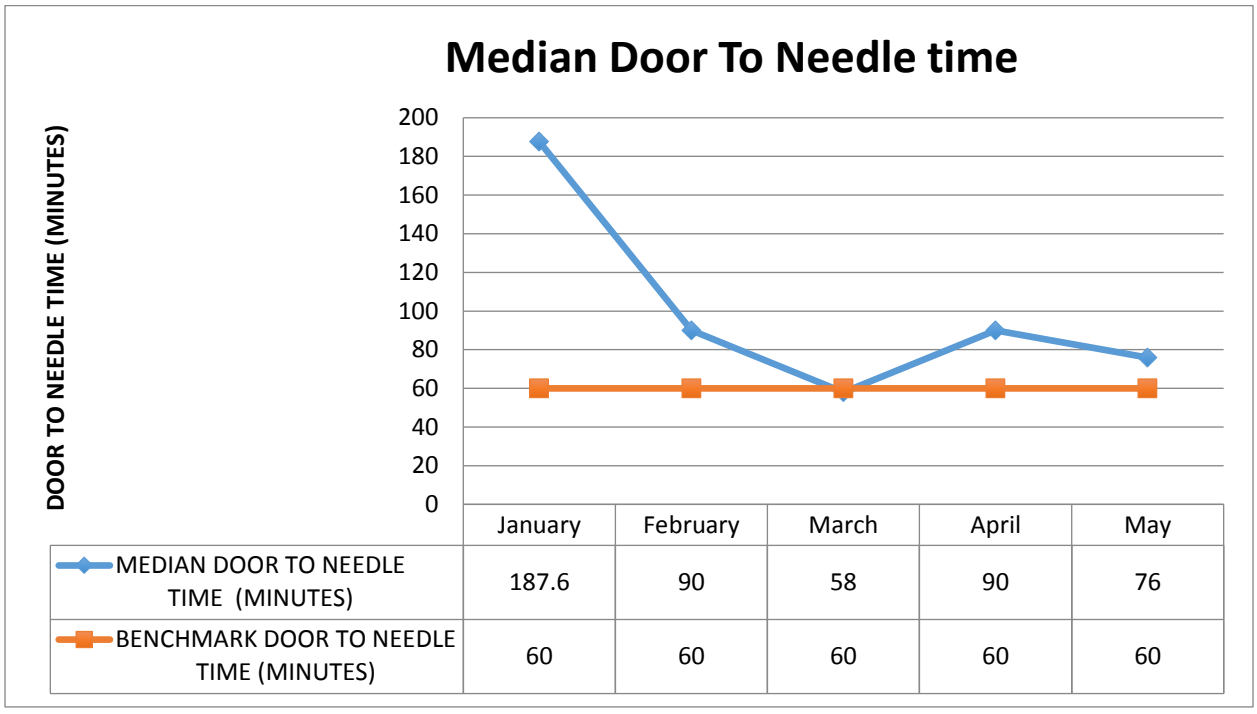

Fig. No. 7 :Figure depicts the median door to needle time from January to May 21, 2017 and the expected door to needle time which is sixty minutes for each month.

OBSERVATIONS AND FINDINGS

The following table gives the median door to needle time from January-May, 2017 :

S. No.	Month,2017	Median door to needle time (mins)
1.	January	187.6
2.	February	90
3.	March	58
4.	April	90
5.	May	76

Table no. 1:Table shows the median door to needle time for respective months from January to May,2017.

The major causes which were observed and were stated by the medical professionals in an interview who deal with care of stroke patients for in-hospital delay are as follows:

1. **CT scan room occupied with another patient.**
   The radiology department has one room designated for CT scan which is easily accessible to the patients in emergency, which may be already occupied by a different patient. In this case the patient with stroke is made to wait till the previous patient's imaging is done.

2. **Obtaining correct history of the patient:**
   Onset of stroke time is a crucial parameter in deciding the treatment plan for stroke patients. Patient's medical and drug history are also important factors to be considered before suggesting thrombolysis as a treatment option. At times eliciting accurate time of onset of stroke and patient's previous medical history from patients and their relatives becomes a difficult task for doctors.

3. **Explaining the risk of thrombolysis and obtaining the consent from the patient's family.**

   Before the patient is given rt-PA injection, the patient's family is explained about the possible risks due to thrombolysis including internal bleeding. This is a time consuming process as the patient's family who is already under stress, takes time in understanding the details and signing the consent form.

4. **Difficulties with drip or catheter insertion.**

   Nurses in some cases experienced difficulty in obtaining IV access and insertion of catheter.

5. **Difficulty in weighing the patient.**

   The dose of tissue plasminogen activator is determined according to the weight of the patient. As most of the stroke patients are in serious condition, weighing them to obtain their accurate weight is difficult.

7. **Indent for drug and it's mixing**

   In few cases delay in ordering alteplase was observed and after its arrival time was lost in mixing of the drug before its administration.

6. **Tracking the location of the patient.**

   The patient who is brought to the emergency department with symptoms of stroke is examined by the specialists of different team. But at times they found it difficult to locate the bed in which the patient is present as there is no designated room for stroke patients.

RECCOMENDATIONS

1. Establish uniform flow-The emergency department should have designated rooms for code stroke so that the specialists from different departments reach the area on time.

2. As soon as code stroke is announced, the radiology department should also be notified so that the suspected stoke patient could be given priority and is not made to wait.

3. Pre-hospital notification and EMS involvement in decision making.(Ante-cubital IV line placement) if the patient utilizing hospital ambulance services.

4. Information gathering on electronic systems (electronic medical record, PACS) while the patient is still in the pre-hospital stage.

5. Rapid patient registration into electronic system.

6. Postponement of placement of foley's catheter ;this can be done after tPA is delivered.

7. Large digital timer adhered to the stretcher from the moment of arrival to show the team the time going by.

8. Standard stroke protocol CT imaging programming.

9. Patients transferred directly from triage to the CT table from the ambulance stretcher.

10. If available and possible use CT table to measure the patient weight

11. tPA should be delivered in CT immediately after imaging.

12. Regular communication with every member of the team about the value of reducing door-to-needle times and encouraging the staff to execute the same.

13. Distribution of the reports for Door To Needle times regularly.

14. Regular suggestions should be sought from the departmental administration team.

15. Reward and recognition program for team members treating patients in less time.

CONCLUSION

This study was commenced with the objective of evaluating the median door to needle time, and to find out the reasons for the delay in the treatment of the acute ischemic stroke patients, who are eligible for thrombolysis. The study findings reflect that the trend of median door to needle time in the study hospital is not in conformity to that which is set by the guidelines of the hospital, for the majority of the study period. The major areas of delays which were observed during the course of the study were, the non availability of the CT scan room, as it was already occupied by other patients; obtaining consent from the family for thrombolysis of the patient and insertion of foley's catheter before thrombolysis, which can be done afterwards.

Reducing treatment times begins with public education. The intra hospital variables that can be restrained as soon as the patient reaches the hospital should be identified by the administration team and steps should be taken to limit them.

Since "Brain is Time" in stroke patients and timely intervention can drastically impact the clinical outcome for the patient, it is imperative to overcome the obstacles which delay the administration of the t-PA.

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ANNEXURE

Annexure 1: STROKE DATA COLLECTION TOOLKIT

Time of Arrival in ER _____ Time of Activation of Emergency Medical System _____

Time from the onset of stroke to arrival in ER (mins) _____

Presenting Complaints:				
	Eye	Verbal	Movement	**Total**
GCS Score				
NIHSS Score - _____				
Seizure at presentation		□Yes □ No		
Old history of Stroke		□Yes □ No		
Old treatment History (Antiplatelate / antithrombotic)		□Yes □ No		
(if yes detail)				
Patient Compliance on Previous Treatment		□Yes □ No		

RISK ASSESSMENT					
Risk Factors:	**Status**	**Duration**	**Risk Factors:**	**Status**	**Duration**
DM	□Yes □ No		HTN	□Yes □ No	
Dyslipidemia	□Yes □ No		Atrial fibrillation	□Yes □ No	
Smoking	□Yes □ No		Genetics	□Yes □ No	
Others			Others		

DIAGNOSIS (IMAGING)			
CT	□Yes □ No	Time taken from arrival in ER	_____

CTA MRI MRA DSA	□Yes □ No □Yes □ No □Yes □ No □Yes □ No	to CT/ MRI Head (min) Time taken during Imaging	
Type of Stroke - □ Ischemic □Hemorrhagic			
Extent of Infarct/ Volume of ICH ASPECTS SCORE: ICH volume (ml): Findings of Angiography			
Other comment			

TREATMENT COURSE IN HOSPITAL (To be filled by JC Neurology)			
	Is Candidate for Thrombolysis	□Yes □ No	Reason (If No)
	Thrombolysis Done	□Yes □ No	Needle Time _____(In min)
	Drug Used for Thrombolysis _____ Dose---------		Door To Needle Time_____(In min)
	Is Candidate for Mechanical Thrombectomy	□Yes □ No	
	Is Mechanical Thrombectomy done Door to groin time--------(min)	□Yes □ No	If Not done (Mention reason)
	Is Neurosurgical Intervention Required	□Yes □ No	Outcome of Acute Intervention
	Is Mechanical Ventilation required	□Yes □ No	Reason
	If ICU Admission Required	□Yes □ No	Reason
	Is Atrial Fibrillation/ Flutter in Ischemic Stroke Patient	□Yes □ No	
	Patient Prescribed Antithrombotic Therapy	□Yes □ No	

	Anticoagulation Therapy during Stay in the Hospital	□Yes □ No	
	Outcome (Condition at the time of discharge)		
	mRS at the time of Discharge _____		
	Present status in the Hospital □Discharged □Death		
DISCHARGE (to be filled if patient is discharged to home)			
	Anticoagulation therapy prescribed at discharge (as per discharge summary)	□Yes □ No	
	Follow-up instruction Given at discharge		
	Medications prescribed explained at discharge		
	□ Risk factors Explained for Rehabilitation □ Warning Signs explained □ Assessed		

Comments :

Signature of Consultant

Annexure 2: STROKE DATA COLLECTION CHECKLIST

DATE: **UHID NO. :**

1. Time of onset of the stroke symptoms……
2. Time of arrival in the ED……..
3. Time taken for triage……..
4. Time of activation of Emergency Medical system……..

TIME FOR ONSET OF STROKE TO ARRIVAL IN ER (min)…….
Remarks:

5. Time of arrival of the last member of the stroke team…….
6. Time required for taking history…….
7. Time taken for neurological assessment……
8. Time taken for conducting CT/ MRI…….

DOOR TO CT/ MRI TIME (min)…….

Remarks:

9. Time taken for interpretation of CT/MRI…….
10. Time taken for obtaining consent for thrombolysis…….
11. Time taken for making indent and delivery of t-PA to ER……
12. Time taken for mixing and administration of t-PA……..

CT/MRI TO NEEDLE TIME (min)……

Remarks:

DOOR TO NEEDLE TIME (min)…….

Remarks:

A study on No-show patients: Reasons for not maintaining scheduled appointments by patients in Urology department

CONTENT

INTRODUCTION

Improving patient experience of medical care has been set as one of the important aims to advance the health care systems in many countries. This goal is contemplated as justly, if not more, imperative as the other targets of improving the health of the population and maintaining per capita cost of medical treatment. An important contributing factor in enhancing patient experience of care is to offer better flexibility to patients regarding how, when and where to receive treatment.

Appointment systems have two objectives: (i) provide improved services to patients by providing them a very short time window during which they are assured to get the medical service, and (ii) safeguard the system from daily variations in demand which can lead to an incompetent system with decrease employment levels in some days and overburden in others. However, appointment schedules do not solve all the unpredictable situations of daily requirement.

Appointment breaking by patient causes problems for the hospital. Patients who neither keep nor cancel their appointments are often referred to as "no-shows".

The factor of patient no-shows (patients who fail to arrive for scheduled appointments) is serious in many healthcare settings, where no-show rates can differ significantly. No-shows decrease provider capacity and hospital productivity, raise healthcare expenditure and reduce the ability of a hospital to offer its patient population by limiting its effective capability. Some service systems such as those in health care experience from huge no-show and cancellation rates, which originate supplementary layers of uncertainty and can result in serious incapability if not dealt with judiciously. The monetary impact is not alleviated by the same-day appointments.

Although multiple causes have been known as barometers of patient no-show including patient demographics, environment, and medical conditions there is limited quantitative research that utilizes patient no-show practise in the appointment scheduling process.

Earlier research reveal patients who miss appointments were younger age group and of lower socioeconomic status .They had a history of being appointment defaulters, had government-provided health insurances, and psychological issues. They are also less inclined to comprehend the intent of the appointment. No-show rates inflate with increasing duration of period between scheduling and the actual appointment. Longer waiting times have been known to be linked to reduced satisfaction which, in turn, leads to less predictable appointment maintenance. Patients have given several reasons for no-shows like busy with work, care of the children, transportation, and financial cost. In addition, both patients who felt healthier and patients who felt sicker were unable to come for the appointment.
A variety of alternatives have been implemented, although none has been fairly effective. The most commonly used have been reminder calls. Other modalities include providing

transportation, education of new-patient, changes in schedules, and incentives or disincentives. In addition, overbooking of the appointment slots by expected no-show rates has been suggested.

The aim of this study is to find out the reasons given by the patients for not turning up for the scheduled appointment and to observe the trend of no show patients in the Urology department of the study hospital, as well as to make recommendations to reduce the no show rates of the department.

In the study hospital, there are three ways of scheduling an appointment: phone call, website and mobile app. Patients can also visit the front office desk and schedule an appointment.

This study focuses on the patients who book their appointments through phone call and includes findings obtained from the telephonic interview conducted with them and in-depth interview conducted with the appointment secretaries who engage with appointment patients.

This study excludes the patients who book their appointments through website, mobile application or those who books appointment in person. This study also excludes routine patients and kidney transplant patients.

REVIEW OF LITERATURE

"No-shows, or missed appointments, represent a common phenomenon in health care." [8]

"Appointment no-shows present problems to both the patient and the treatment organization. In addiction services, employing process-related interventions that can reduce waiting time for services and increase the capacity for services could be beneficial. Nonprocess improvement changes such as improvements to the physical environment should not be addressed in isolation. This study confirms that behavioral engagement strategies do impact appointment show rates and increase the patient's therapeutic engagement with the clinician." [11]

"Three interconnected themes emerged from the interviews as barriers to appointment attendance: emotional barriers, perceived disrespect of the patient's beliefs and time by the health care system, and distrust and lack of understanding of the scheduling system. Transportation and child care were logistical barriers, but respondents noted they could be overcome." [7]

"For patients, the cost includes their dissatisfaction and reduced quality of care. An automated telephone appointment reminder system may decrease the no-show rate. Understanding characteristics of patients who miss their appointments will aid in the formulation of interventions to reduce no-show rates. In general health, staff reminder calls reduced no-show rates from 23.1% to 13.6%." [12]

"Improved strategies for communications with parents, a flexible appointment system and better communication between the clinical and admin teams resulted in a significant reduction in the no-show rate in this busy paediatric neurology clinic. There were also associated benefits of improving access for urgent patients and a reduction in the overall waiting time.Sustaining the gains required vigilance and regular audit of the outcome measure, which is currently one of the key performance indicators for paediatric neurology. A feedback loop was created for the clinical team to inform the booking services when the no-show rate goes up to rectify the process." [10]

[1]

[1] [8] Missed appointment rates in primary care: The importance of site of care.
[11] Reducing Appointment No-Shows: Going from Theory to Practice.
[7] Why we don't come: Patient's perceptions on No-shows.
[12] The effectiveness of outpatient appointment reminder systems in reducing no-show rates
[10] A Quality Improvement Project to Reduce the 'No-show' rate in a Paediatric Neurology Clinic.

[1]

"In static scheduling, appointment times are not adjusted once the scheduled day begins, while in the dynamic case, schedule adjustments can be made as the day evolves. Dynamic scheduling is appropriate for in-patient situations where patients are available for early service or can wait in their rooms if the schedule is delayed. It can also be applied in outpatient settings with same day scheduling. In most outpatient clinics, however, there is little opportunity to adjust patient appointment times once the schedule is fixed." [1]

"Performance measures dictate how a schedule is evaluated and are categorized as time, congestion, and fairness-based. Time measures are a function of patient waiting time, physician idle time, and staff overtime; congestion measures capture features such as waiting room utilization; and fairness measures look at how waiting times are distributed across the day (often, patients arriving later experience greater expected waiting)." [2]

"Gupta et al. (2006) proposes several additional measures. The design of an appointment system is specified by the "block" (number of patients arriving at the beginning of an appointment period), the \initial block" (number of patients arriving for the initial appointment), and the \interval" (length of the appointment interval which is either fixed or variable). These parameters can be adjusted based on the presence of environmental complexities such as walk-ins, urgent and emergency patients, and patient specific service time distributions."[3]

"Kim and Giachetti (2006) also propose clinical overbooking to cope with patient no-show, again with a single no-show probability for all patients. Their model assumes deterministic service time and maximizes expected revenue minus overtime and penalty costs incurred when patients leave without being seen. They do not explicitly consider patient waiting time as part of the objective."[6]

[1] [1] Dynamic routing of customers with general delay costs in a multiserver queuing system.
[2] A controlled trial of an advanced access appointment system in a residency family medicine centre
[3] Outpatient scheduling in health care: A review of literature. Production and Operations Management
[6] A Stochastic Mathematical Appointment Overbooking Model for Healthcare Providers to Improve Profits.

PROBLEM STATEMENT

The issues arising from no show patients are faced by every healthcare organization, irrespective of location and scale of the organization. Problems arising from no show patients have troubled many managers as they have both temporal and monetary implications for the hospitals. The care and skill which could be provided to patients by the medical staff will not reach its maximum potential if no show rates are not contained. Even though this is a universal matter, still it has not received the amount of attention it demands.

PROBLEM JUSTIFICATION

In conventional appointment scheduling systems, patients are informed by the hospital the date and time of appointment and the name of the doctor or are given options on the phone. Patients who plan and book appointments and fail to maintain them have an unfavourable impact on the workflow of the hospital in many different ways. When patients fail to maintain the appointment it will affect the patient care, productivity, and learning. No-show patients also have financial implications for the hospital and opportunity cost for other patients.. This report intends to find out what percentage of patients fail to keep the scheduled appointment and study the reasons given by the no-show patients and patients who cancel the appointment for not turning up, so that in case if there is a need of modification required in the current appointment system, then it can be identified.

RESEARCH QUESTION

What is the trend in appointment scheduling and patient turn up in the Urology department of a Super specialty hospital, New Delhi?

What are the reasons given by the patients for not turning up and cancelling the scheduled appointment?

OBJECTIVES

To study the trend in appointment scheduling and patient turn up in the urology department of a Super specialty Hospital, New Delhi.

To identify the reasons given by patients for cancelling the appointment and for not turning up for the scheduled appointments.

RESEARCH METHODOLOGY

Type of study:
Descriptive

Target population:
Cohort Analysis of patients who failed to turn up for the scheduled appointment

Study location:
Department of Urology, Ground floor, East wing, Max Super Specialty Hospital, Saket, New Delhi

Duration of study:
3 weeks (May1, 2017- May 21,2017)

Type of data:
Quantitative

Technique:
Telephonic interview and interview of the staff

Data collection:
Primary data collection

Data entry:
Manual

Data analysis:
Microsoft Excel

DATA ANALAYSIS AND INTERPRETATION

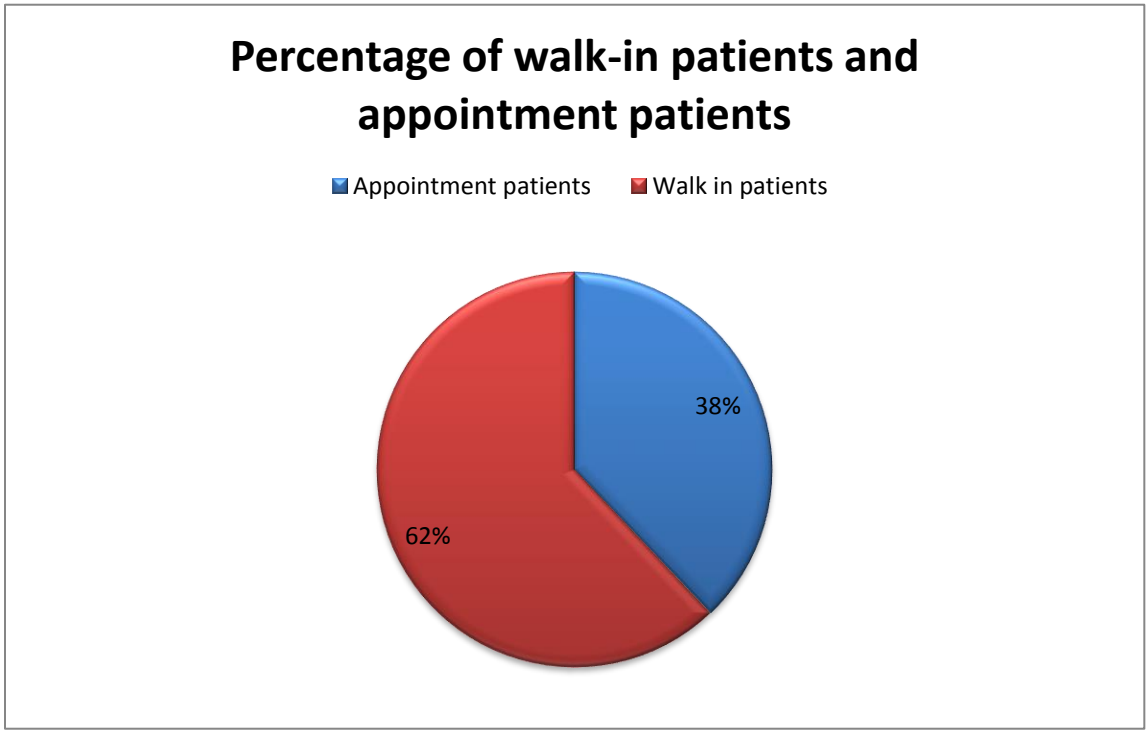

Fig. No.1: Figure depicts that out of 393 patients who visited the department in three weeks, 38% patients were appointment patients.

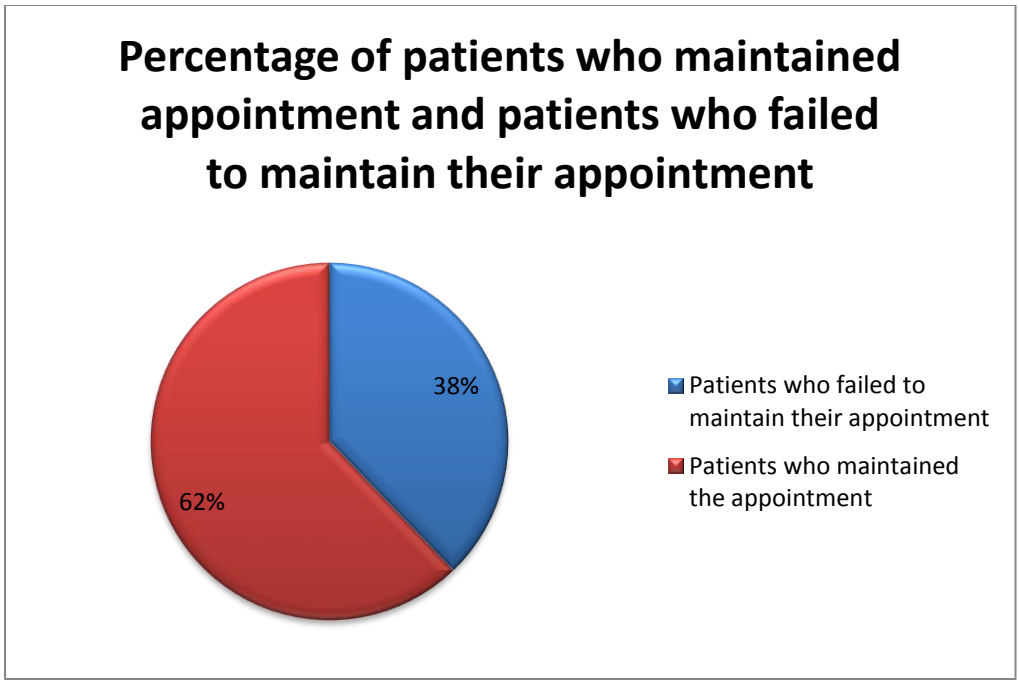

Fig. No. 2: Figure shows that out of 238 scheduled appointments, 62% patients maintained their appointment, whereas 38% patients failed to maintain their appointments.

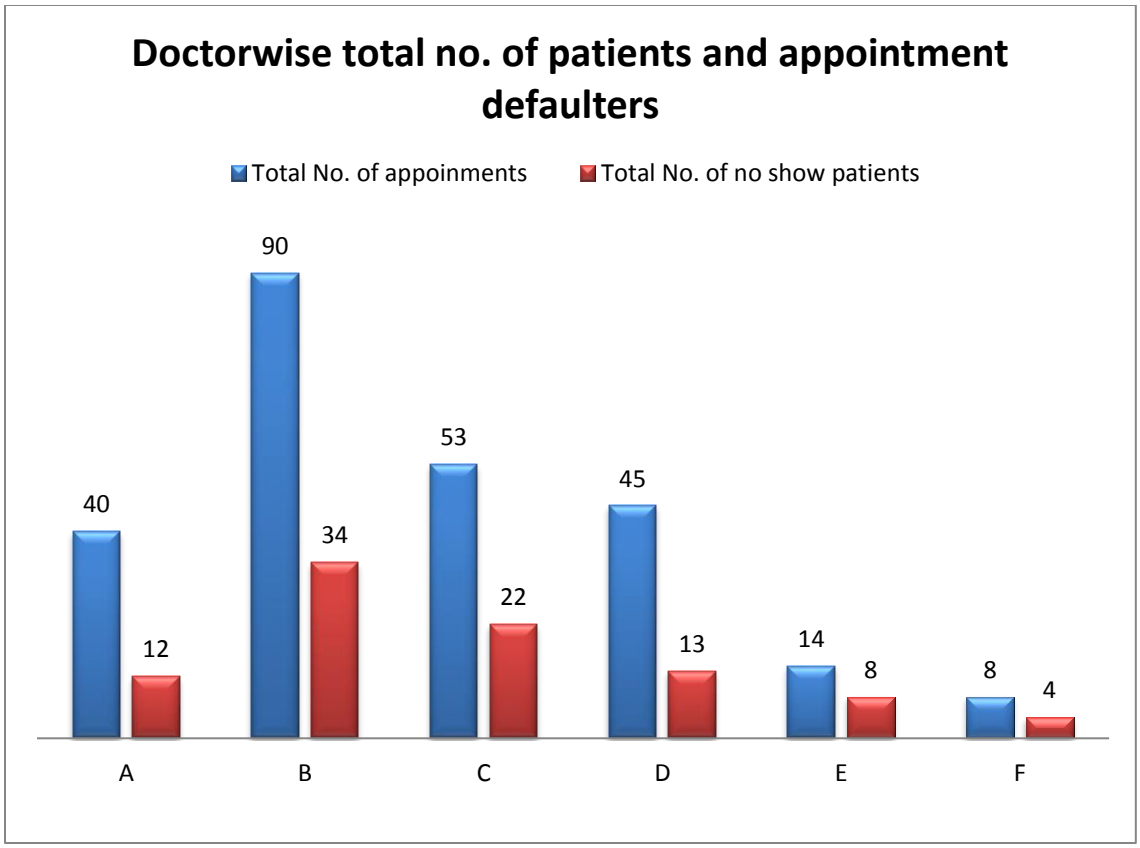

Fig. no. 3: Figure depicts scheduled appointments and proportion of appointment defaulters for each doctor of the department.

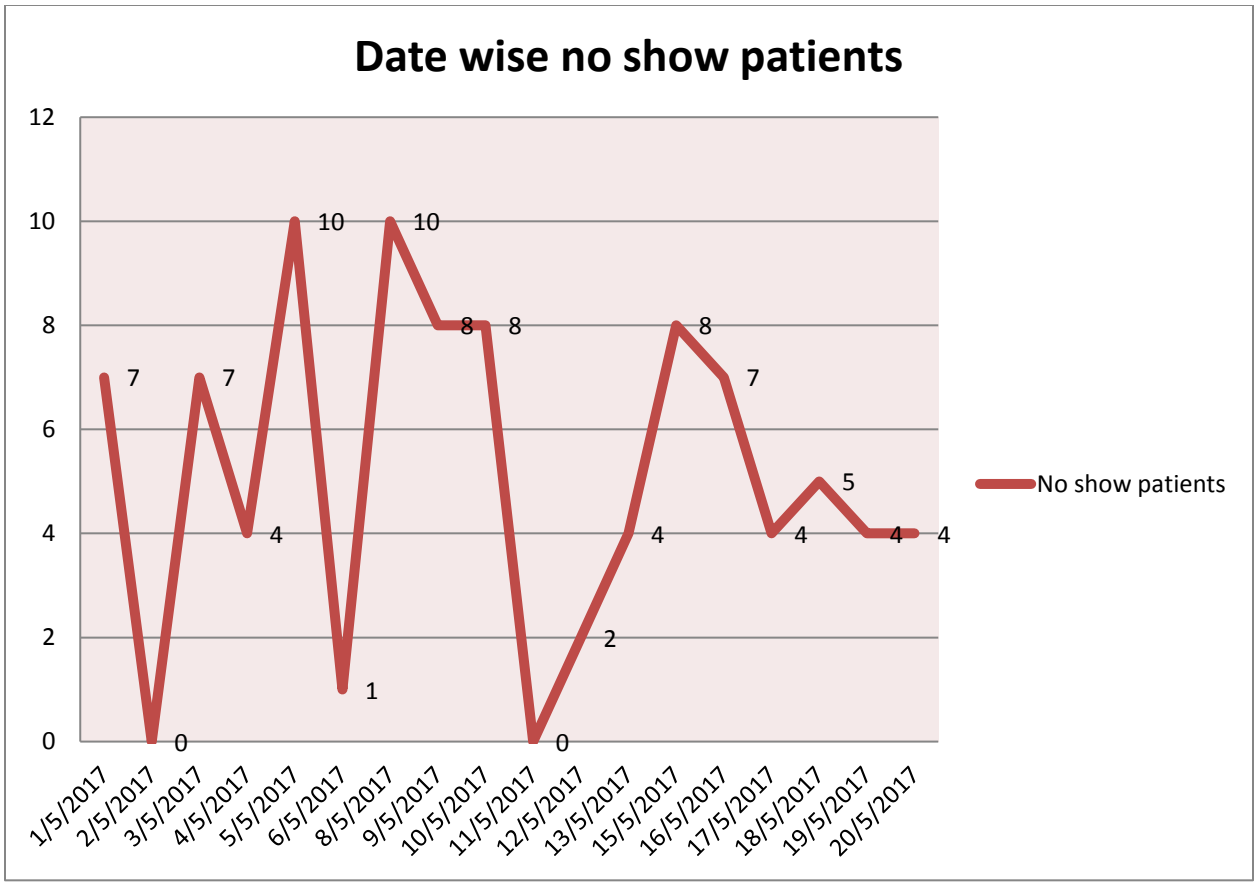

Fig. No.5 : Figure shows date wise trend of no-show patients and appointment defaulters. On 5th May,2017 and May 8,2017, maximum no. of patients failed to maintain their appointments.

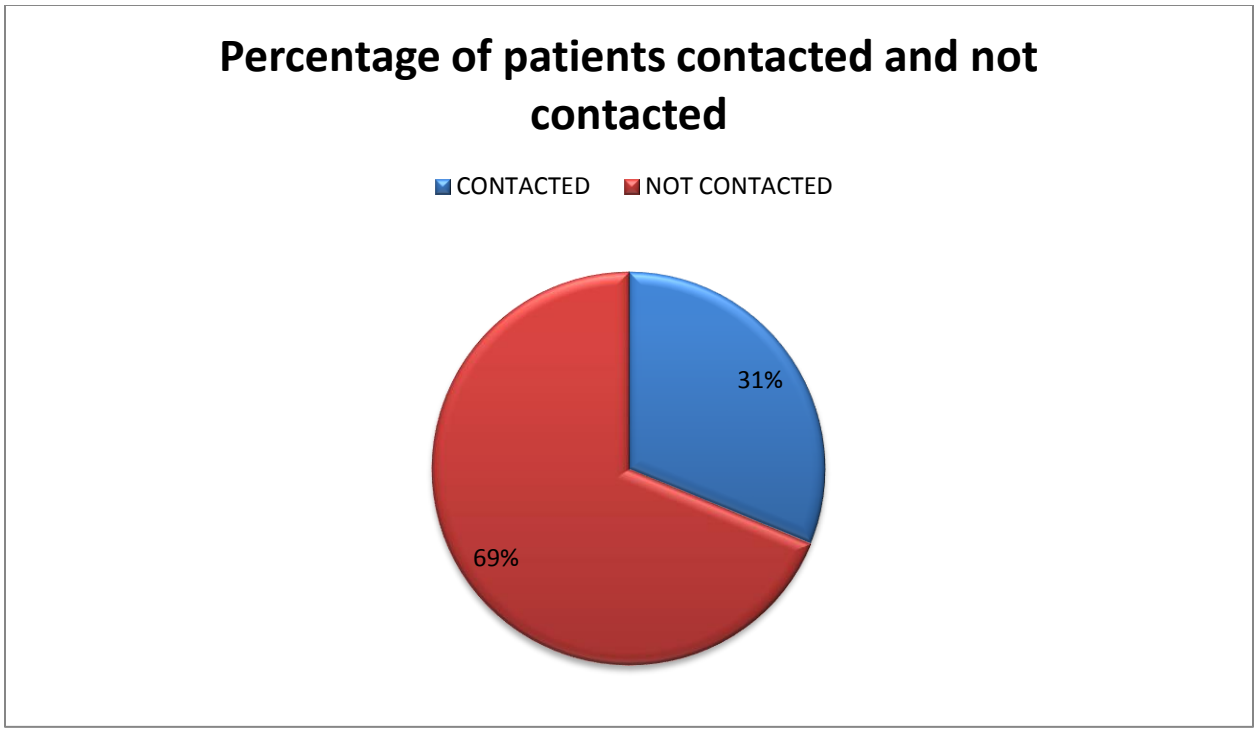

Fig. No. 6: Figure depicts the percentage of patients contacted for the study. Reasons for not contacting the patients were: No answer, Not a valid contact no. , mobile switch off, Not reachable and wrong no. Out of 93 patients, 29 patients were contacted.

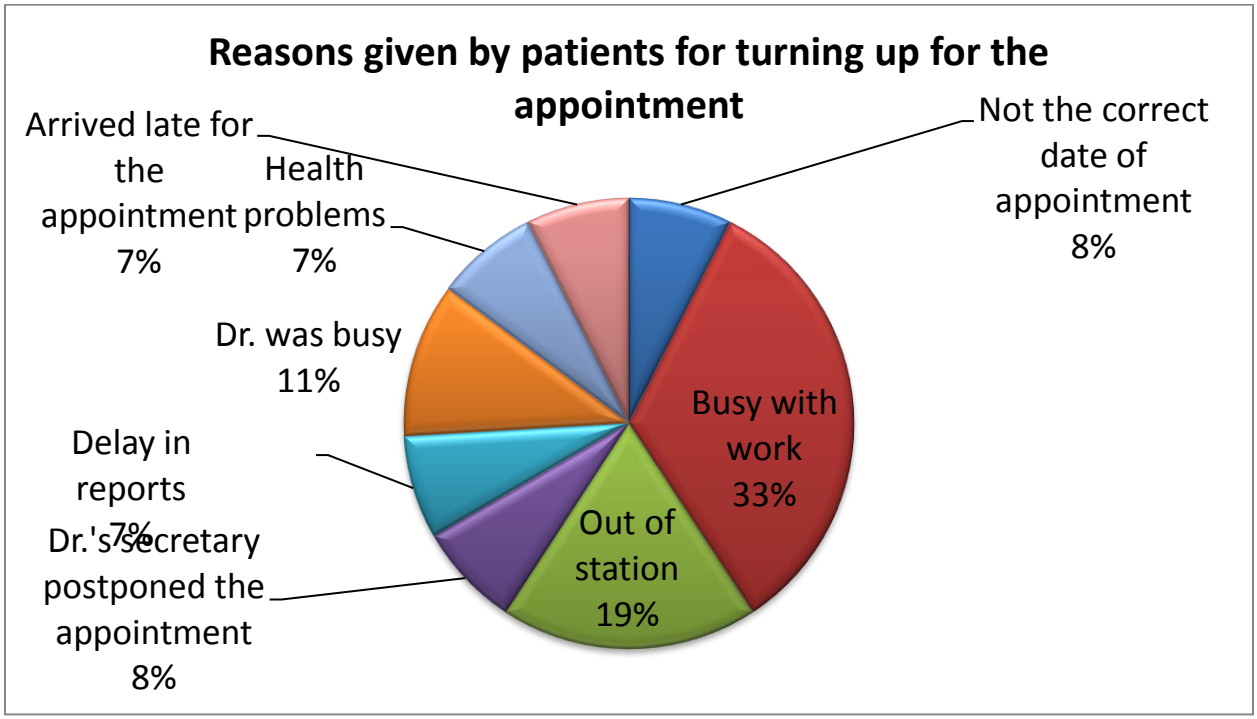

Fig. No. 7: Figure reveals the reasons given by the patients who were unable to maintain their appointment. 33% contacted patients stated that they were busy with work, 19% patients stated that they were out of station and 11% patients said that doctor was busy during the scheduled appointment slot, so they left after visiting the department.

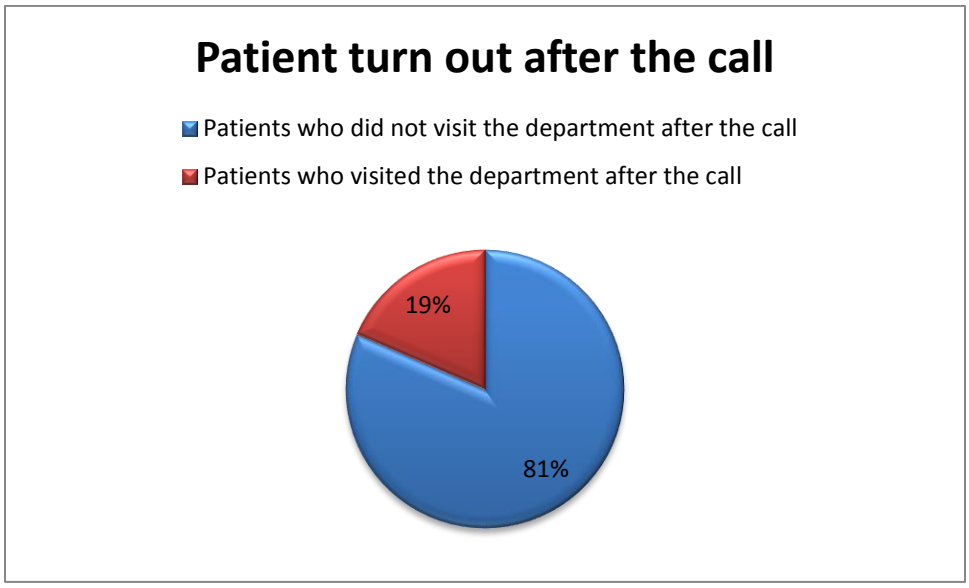

Fig. no. 8: Figure shows the turnout of the patient after the telephonic interview with no-show patients was conducted, 19% of the contacted patients visited the department for the appointment.

OBSERVATIONS AND FINDINGS

The observations of the study will be discussed under the following headings

Interview of the patients:

Telephonic interview of 29 patients were conducted to identify the reasons given by them for not maintaining their scheduled appointments. Following were the reasons given by them:

1. Busy with work-33%
2. Patient was out of station on the day of appointment-19%
3. Doctor was busy during the scheduled appointment time slot, so patient left without consulting the doctor-11%
4. Doctor's secretary called and postponed the appointment-8%
5. Date recorded in the appointment schedule is not the same as intimated to the patient-8%
6. Delay in obtaining reports (to show the reports patient took the appointment)-7%
7. Health problems (patient was too unwell to travel or patient started feeling well)-7%
8. Patient was late for the appointment-7%

Interview of the staff:

An interview of the staff who manages the appointment of the doctors was conducted. Following are the main findings from the interview:

1. Doctor gets engaged in the surgery which gets extended beyond the expected time, so the secretary postpones the appointment after consulting with the patient.
2. Doctors are also asked for consults from different departments which are unavoidable in which case the secretary reschedules the appointment for a later day.
3. VIP Patients may arrive without prior intimation, which leads to increased waiting time for other patients/
4. Even though appointment patients are given priority but majority of patients are walk-in patients, so while accommodating walk in patients' strict compliance to scheduled time slot for appointment patients becomes difficult.
5. On multiple occasions patients have complained that there is a long waiting time in the department and their value of time is not respected.

6. Patients who are follow ups or those who have to show their investigation reports fail to make an appointment and show up during OPD peak hours and they request the secretaries to arrange a meeting with their doctors.

RECOMMENDATIONS

1. OPD services after standard office hours and on weekends might provide an easier access to the services of the department for office goers.
2. A flexible appointment scheduling system should be available which will accommodate varying needs of the patient.
3. Appointment keeping behavior among patients can be enforced if appointment making is made mandatory before the consultation. Patients who are follow ups or are visiting the clinic to show their investigation reports should be informed to make a prior appointment as well.
4. If the doctor is busy with surgery and his/ her patient is already present in OPD, then the patient should be asked to seek consultation from any other doctor of the team.

   Patient should be assured that the details of the discussion will be shared with their treating doctor.
5. If patient fails to show up for the appointment, next day patient should be called to find out the reason for not turning up for it and he/ she should be provided with an option for rescheduling the appointment according to the convenience of the patient.
6. Walk-in patients who are classified as emergency cases should be advised to visit the emergency department first and then accordingly schedule an appointment from next time with the department for consultation so as to avoid any delay in treatment for self and other patients.
7. Patient education regarding the importance of appointment scheduling should be done in new patients, so that they are motivated to do the same in the future.One of the ways could be by display of posters in the department highlighting the benefits of taking an appointment.
8. During peak hours of the OPD, number of staff should be increased at front office for patient management. Delay in registration and billing services should be avoided. Staff of the department should treat patients with patience be and respectful while they are dealing with patients who complain about the waiting period.

CONCLUSION:

Failure of patients to keep appointments constitutes to a barrier to the delivery of continuous care in many hospitals. The problem of patient no-show in outpatient delivery systems has been a long recognized issue. The negative impacts include underutilized medical resources, increased healthcare costs, decreased access to care and reduced hospital efficiency and provider productivity.

Appointment schedules are designed with the purpose of providing quality and timely patient care and to maintain the patient flow. But it is observed that seldom patients maintain their appointments. Most of the reasons given by the patients for not turning up for the appointment are justified on their side, but it creates patient management problems for the hospital which to a large extent is avoidable. A contemporary and flexible appointment scheduling system and a practical appointment cancellation policy should be designed to cater the varying needs of different patients. Patients should be motivated to schedule an appointment for their visit and in case they are not disposable for it, then they should be requested to make a cancellation call.

Mutual understanding between the patients and hospital staff in understanding the importance appointment scheduling can lead to better patient care and appointment attendance.

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ment system in a residency family medicine center.[https://www.ncbi.nlm.nih.gov/pubmed/15129381]. Accessed April 29, 2017.

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Medication turnaround time in IPD Settings

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INTRODUCTION

Medication turn-around time, is defined as the interval from the time a medication order was composed (manually or electronically) to the time the medication was handed over to the nurse and administered. Moreover, time-to-first dose can be broken down into two key phases: the time from when the order was composed to the time that the pharmacy verifies the order, and the time from pharmacy verification to the time the medication was delivered.

This process can be divided into the following three steps:

1. Ordering: Indent for drugs made by the doctor
2. Ancillary services:
   In patient pharmacy receives printed order notice.
   Entry into the pharmacy system
   Composing the drug order
   Delivery of the drug
3. Order completion:
   Administration of the drug
   Electronic documentation

Observing medication turnaround time settings having inpatient facilities permits the organizations to weigh the overall efficiency of the coordinated delivery of patient care by the medical team and the inpatient pharmacy services.

Prescribed medication turnaround time for stat medications is thirty minutes, now medication is sixty minutes and for routine drugs it is one hundred and twenty minutes in the study hospital.

This study is an Observation study wherein observations will be made regarding:

1. The time doctor made the indent for the drugs.
2. The time orders were received, verified by the pharmacy and the issue slip was generated.
3. The time taken by the pharmacist to compose the order
4. The time taken for delivering the medicines

This study aims to evaluate the average medication turnaround time for stat and routine medicines prescribed for inpatient and new admissions respectively.

This study excludes medication turnaround time for routine medicines of inpatient admissions, stat medicines for new patients and now medicines for both inpatient and new admissions.

REVIEW OF LITERATURE

"Medication turnaround time can be defined as the time between when a medication indent is composed, either hand written or electronically recorded, and the time medications are delivered to the nursing unit. Medication error is defined as any preventable event that may lead to inappropriate medication usage or harm to patient while the medications are in the control of the healthcare professionals. Patient safety needs to be ensured in every step of the process, from choosing the medication, to writing prescription, to dispensing the medication. On a management level, the result of this study can be used to improve and strengthen administration and nursing, physician support." [1]

"Process breakdown, including traditional patient safety issues, work flow interruptions, and inefficiencies has been shown to account for as much as 78 percent of adverse drug events1,6 contributing significantly to an increase in associated costs.The accurate administration of medication requires the completion of four interdependent steps—order placement by the physician, transcription by the nurse, verification and dispensing by the pharmacy, and administration by the nurse. Errors introduced at any step of the process can be unwittingly transmitted to the next step. The percentage of medication errors occurring in the four stages of the medication process has been categorized: Physician ordering constitutes 39 to 49 percent of the reported errors, nursing administration 26 to 38 percent, medication transcription 11 to 12 percent, and pharmacy verification and dispensing 11 to 14 percent."[2]

"A medication event was defined as the completion of the entire cycle, from the physician order (manual or electronic) through medication administration. In the study of medication turn-around times, additional measurements specific to pharmacy were made. These included the time orders were received and verified by pharmacists, the time orders were entered into the pharmacy system, and the time medications were actually administered to the patients. The accurate administration of medication requires the completion of four interdependent steps—order placement by the physician, transcription by the nurse, verification and dispensing by the pharmacy, and administration by the nurse."[3]

[1]

"The Effects of Computerized Provider Order Entry on Medication Turn-around Time: A Time-to-first Dose Study at the Providence Portland Medical Center by Jeffery R. Jensen. According to this study, Time-to-first-dose, or medication turn-around time, is considered the interval from the time a medication order was composed to the time the medication was delivered. Moreover, time-to-first dose can be broken down into two key phases: the time from when the order was composed to the time that pharmacy verifies the order, and the time from pharmacy verification to the time the medication was delivered."[4]

"Inefficient medication use processes for stat orders jeopardize the effectiveness of pharmacotherapy in treatment regimens and the quality and safety of care in the inpatient setting. Pharmacists, pharmacy technicians, and nurses expressed the need to re evaluate and standardize the stat medication process in order to achieve the hospital policy which states that medication orders written as stat should be administered to the patient within 30 min of the time that the order is written. Pharmacy's direct involvement in this process improvement can be divided into two measurable processes. The process of order fulfillment includes the time elapsing from order request to product check by pharmacist. The second process consists of medication delivery to the patient care area, represented by time elapsed from departure of medication from the pharmacy until delivery to patient care area. Additional process categories may include order transcription, order verification, filling of medication orders, product check by a pharmacist, medication delivery, as well as staging between process steps. Although medication turnaround time, in its entirety, is well defined, the individual component processes are highly variable and influenced by a wide variety of factors. Despite evolving technology in the hospital pharmacy environment, few technology solutions have provided complete visibility into process flow. Real-time tracking of pharmacy processes and performance, similar to what occurs in other industries, provides the capability to quickly and efficiently measure, analyze, and apply process and performance data within the field of inpatient pharmacy operations. Ideally, a technology solution should track not only medication location

[1] [1] Turnaround time of IP Pharmacy, Monitoring Medication errors and material management of central store, OT store and pharmacy.
[2] Immediate benefits realized following implementation of POE at an Academic Medical Centre.
[3] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC346640/

[4] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1839570/
[5]http://www.plusdeltatech.com/d/PharmTrac%20Performance%20Monitoring%20White%20Paper%202013%203.1.2013.pdf
[6] https://web.wpi.edu/Pubs/E-project/Available/E-project-060310-122231/unrestricted/IQPVA_FINAL

through the process but also track critical information regarding workflow, productivity, and efficiency and provide real-time feedback regarding performance."[5]

"Poor performance, i.e., late deliveries, also contributes to the incidence of missing medications and numerous calls from nursing to determine medication location. Published evidence has suggested that missing medications may represent nearly 3% of total pharmacy volume dispensed, equivalent to over 200 missing medications per day in one organization."[6]

RATIONALE

Medication turnaround time is one of the important parameters which reflects the efficiency of the pharmacy and coordination between pharmacy, GDAs and nurse staff. Only if the drug is delivered on time, will it be administered on time, which highly affects the health outcomes of the patient. Since medicines have a major role in the hospital system and patient care, monitoring of the medication turn around should be a norm for every hospital, and strict policies regarding the ways to reduce the turnaround time should be framed and implemented, so that no delay in delivery of drugs can create a threat to patient care.

OBJECTIVES

1. To estimate the Turnaround time for stat and routine drugs in inpatient and new admissions respectively in a Super Specialty Hospital, Saket.

2. To identify the reasons contributing to increased medication turnaround time.

3. To make recommendations to improve the medication turnaround time.

RESEARCH METHODOLOGY

- Study type: Quantitative, Descriptive, Observational study

- Sample location: Critical and Non critical areas for both East and west blocks (busiest floors with patients receiving mixed specialty services, predominant services being CTVS, Urology), Max Super Specialty Hospital, Saket, New Delhi.

- Study sample:
  - For routine drugs, newly admitted patients
  - For stat drugs, already admitted patients
  -
- Sample size: 150 patients

- Study period: 2 weeks (May 1,2017-May14, 2017)

- Sampling technique: Convenience sampling (non-probability)

- Data collection:

  - Primary data: Time motion study tool
  - Secondary data: Research paper, articles, guidelines

DATA ANALYSIS AND INTERPRETATION

FIGURE-1

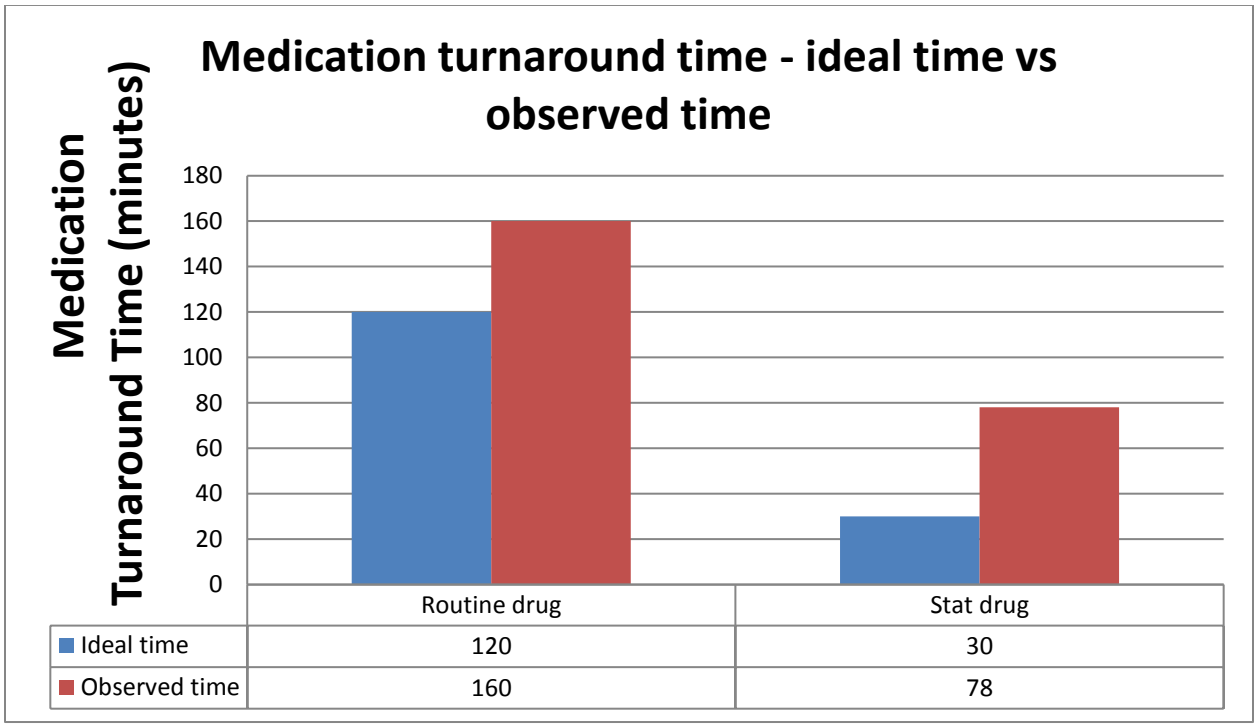

Fig. no.1: Figure depicts that the medication turnaround time for routine drug should be 120 minutes ideally, but on observation medication TAT was 160 minutes. Similarly for Stat drugs medication TAT should be 30 minutes, but it was observed to be 78 minutes.

FIGURE-2

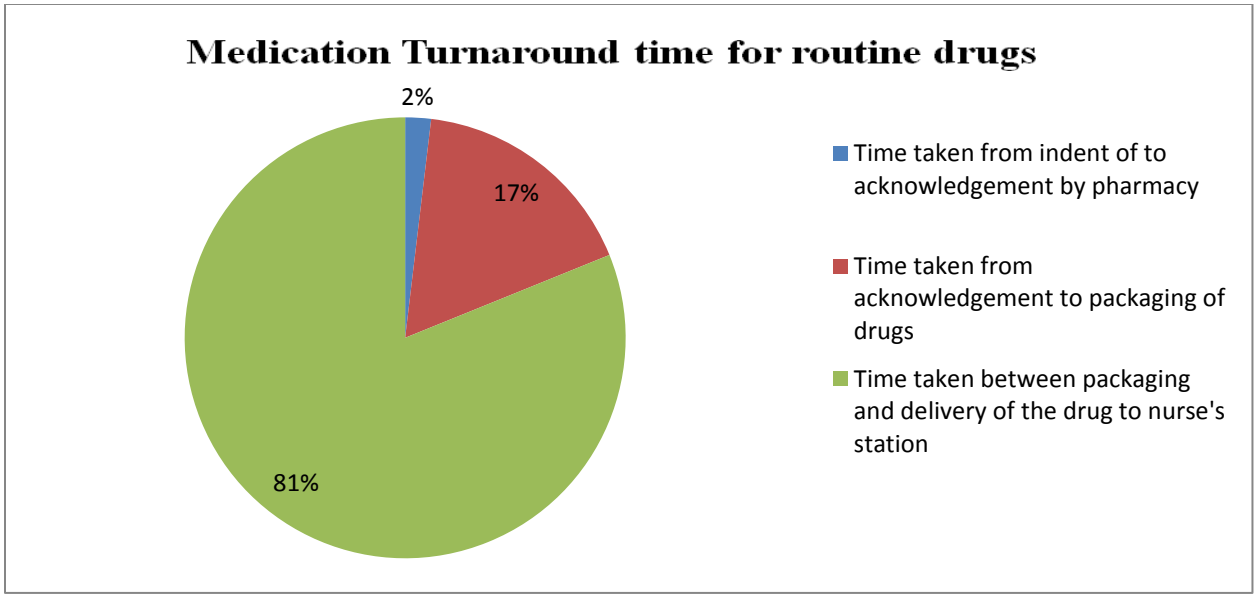

Fig. No.2: Figure shows that for routine drugs out of total Medication TAT 81% time was used for delivery of drugs, 17% was used for packaging of drugs, and 2% time is utilized in acknowledgement.

FIGURE-3

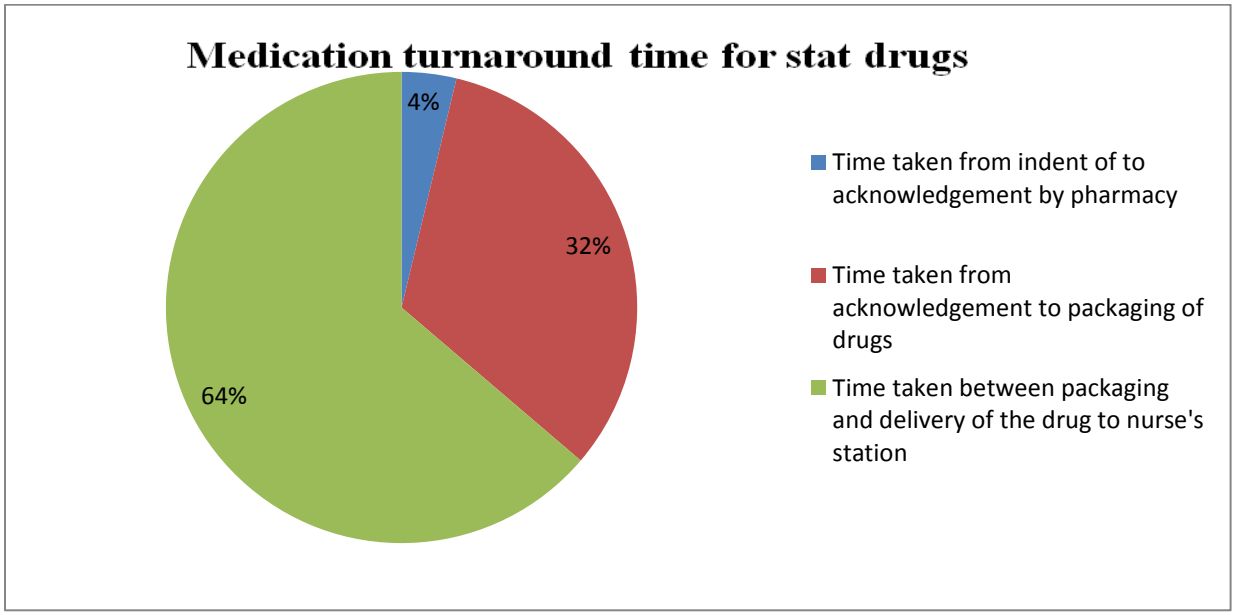

Fig. no.3: Figure shows that for stat drugs out of total Medication TAT 64% time was used for delivery of drugs, 32% was used for packaging of drugs, and 4% time is utilized in acknowledgement.

FIGURE-4

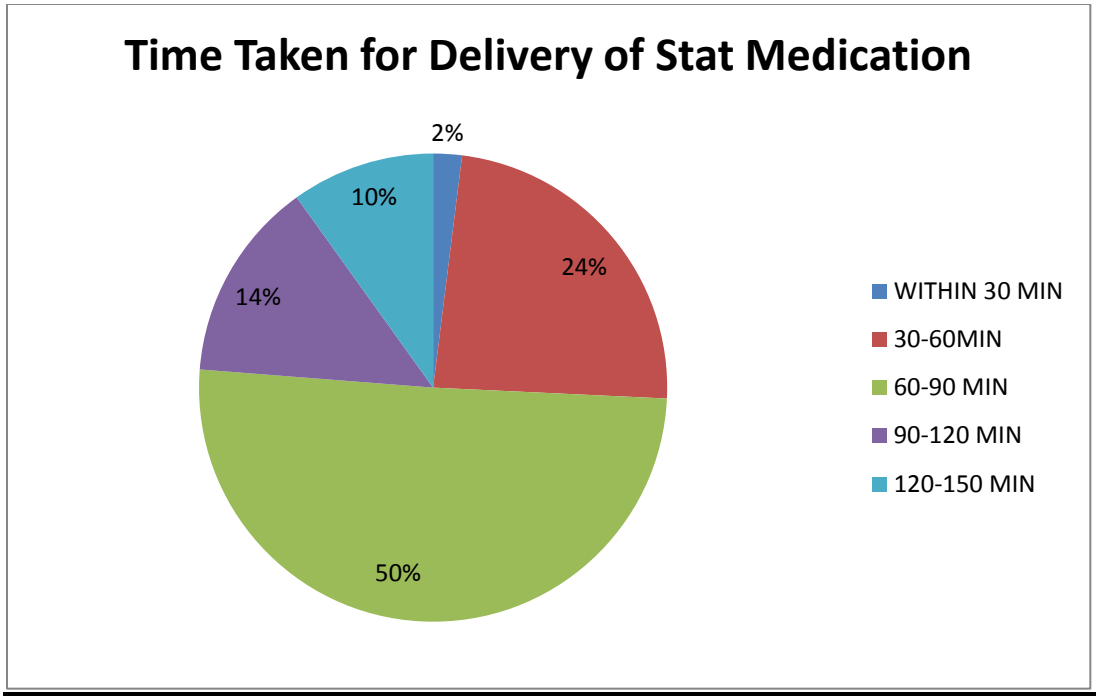

Fig. no.4: Figure shows that for stat drugs out of total Stat Medication TAT 50% of drugs get delivered within 60-90 min, 24% of drugs get delivered within 30-60 min, 14% of drugs get delivered within 90-120 min, 10% of drugs get delivered within 120-150 min and 2% of drugs get delivered within 30 min.

GURE-5

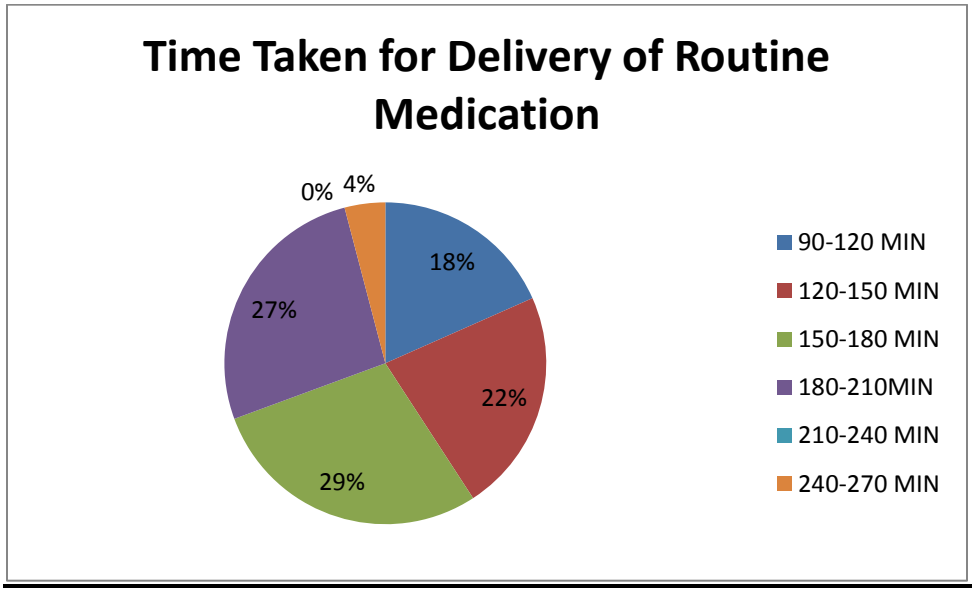

Fig. no.5: Figure shows that for Routine drugs out of total Routine Medication TAT 29% of drugs get delivered within 150-180 min, 27% of drugs get delivered within 180-210 min, 22% of drugs get delivered within 120-150 min, 18% of drugs get delivered within 210-240 min and 4% of drugs get delivered within 240-270min.

FIGURE-6

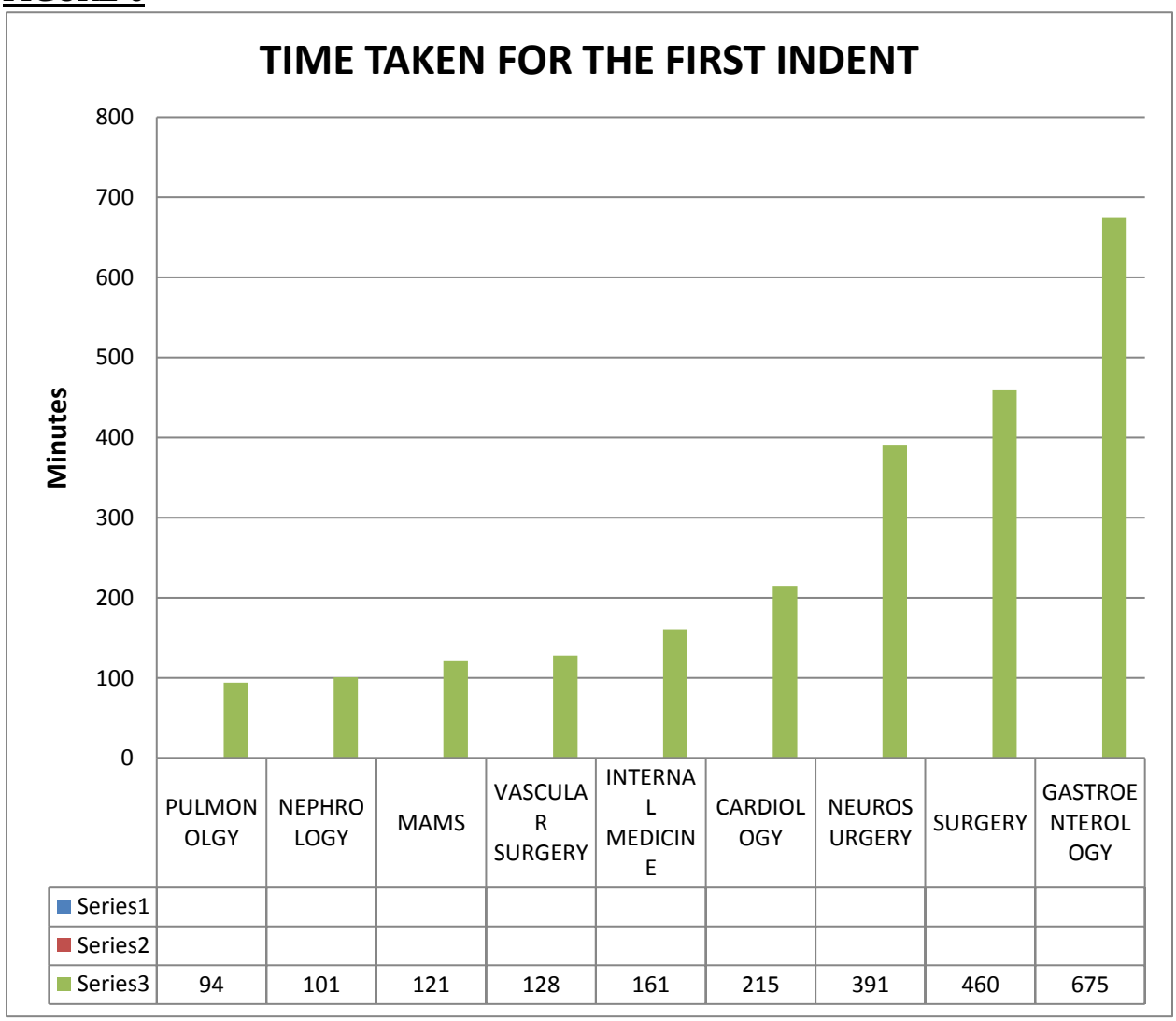

Fig. no.6: Figure shows the time taken in placing first indent for Routine drugs in newly admitted patient department wise.

OBSERVATIONS AND FINDINGS

	Routine drug	Stat drug
Ideal time (minutes)	120	30
Observed time (minutes)	160	78

	ROUTINE DRUGS	STAT DRUGS
Average time taken from indent of to acknowledgement by pharmacy (T2-T1)	3 min	3 min
Average time taken from acknowledgement to packaging of drugs(T3-T2)	27 min	26 min
Average time taken between packaging and delivery of the drug to nurse's station(T4-T3)	129 min	51min
Average time taken from indent of drug to its delivery to nurse's station (T4-T1)	160 min	78 min

- The ideal medication turnaround time for routine drugs is 120 minutes, but it was observed as 160 minutes in the study hospital.

- The ideal medication turnaround time for stat drugs is 30 minutes, but it was observed as 78 minutes.

- During the study it was observed that following acknowledgement of the order by the pharmacy, an issue slip is generated. Issue slips are generated at a time for multiple orders without giving priority to the order time of the drugs.

- Physical unavailability of the drug in the pharmacy, which might take time for restocking process.

- Composing of drug order in pharmacy is not done according to the priority status of the drugs, which results in delivery of stat and routine drugs at the same time.

- On issue slips, the priority of the drug was not present which otherwise might have aided in identification of the order and its timely delivery.

- Single GDA is allotted to multiple floors for delivery of drugs which is the main reason for increase in medication turnaround time.

- It was observed that when there is extreme delay in the arrival of drugs, the nurse's send their staff to the pharmacy to collect the drugs.

- In many instances it was seen that GDA was made to wait for acknowledgement of drugs by the nurses, because of which he was unable to reach other designated floors on time.

- Other than the nurse who acknowledged the delivered drugs, other nurses of the team were not aware of the delivery of the drugs to the nurse's station.

- CPRS is not updated when the priority of the drug is modified.

RECCOMENDATIONS

- Sorting out of stat and routine drug orders should be done strictly on the basis of priority so that the stat drugs reach the counter within thirty minutes.

- Issue slip should contain an allocated space for the mention of priority of drug, so that their identification by the GDA and nurses becomes easier.

- Number of GDAs should be increased for the delivery of the drugs, and they should be divided floor wise.

- GDAs for critical and non- critical areas of the hospital should be divided.

- A single person should be present at every nurse counter to whom the GDA will report and who will be responsible for acknowledgement of the drugs, verification and sorting out the drugs on the basis of priority.

- Creation of different counters within the nurse's station for rooms of the floor in a visible area where the above said person will place the drugs and inform the nurses of the arrival of the drugs.

CONCLUSION

Patient safety is ensured when every step of the process, from intending the medication, to dispensing the medication is optimized to prevent delays in therapy and medication errors.

Through this study, we were able to identify various points of delays, which were occurring in delivering indents to the patients. The results of the study revealed that all types of indents were delayed; especially stat indents, which is the major area of concern.

The delays in delivering of drugs and medical consumables interrupt smooth functioning of pharmacy. Monitoring medication turnaround time in inpatient settings allows organizations to measures the impact of their quality on the increased efficiency of patient care. Hospitalized patient may experience delays in care due to medication administration. Delays can lead to problems thats why continuous monitoring of the procedure and continuous efforts, dedication of whole staff and co-ordination between the staff members is required for smooth running of the process of pharmacy to vitalize the lifelines of hospital that is "medicines".

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