

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

- **Study on the Surgical Safety Chcklist compliance in the West Wing, Operation Theatre Complex, Max Hospital ,Saket**
- **Study on the Scheduling, Cancellation and Delays in the Surgeries of the West Wing, Operation Theatre Complex, Max Hospital ,Saket**
- **Study on the OT Utilisation of the West Wing, Operation Theatre Complex, Max Hospital ,Saket**
- **Study on the Surgical Bed Utilisation in the Economic Ward ,East Wing, Max Hospital ,Saket**

**By
Akanksha Mamgain**

**Under the guidance of
Dr. Anoop Khanna**

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



**The IIHMR University, Jaipur
2016**

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Akanksha Mamgain**, student of MBA Hospital and Health Management from the IIHMR University, Jaipur has undergone summer training at Max Hospital, Saket, New Delhi from 1st April to 31st May, 2016.

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

The Internship is in fulfilment of the course requirements.

I wish her all success in all her future endeavours.



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



Dr. Anoop Khanna
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CERTIFICATE OF COMPLETION

This is to certify that

Dr. Akanksha Mamgain

has been associated as an

INTERN

with the department of

MEDICAL ADMINISTRATION

for a period of

1st April 2016

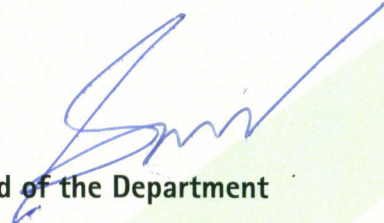
to

31st May 2016

at

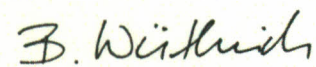
Max Super Specialty Hospital,
Saket

"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 Excellence
Max Healthcare

ACKNOWLEDGEMENT

I am using this opportunity to express my gratitude to everyone who supported me throughout the course of this MBA project and Summer training. I am thankful for their aspiring guidance, invaluable constructive criticism and friendly advice during the project work. I am sincerely grateful to them for sharing their truthful and illuminating views on a number of issues related to the project.

I express my warm thanks to Dr. Sandeep Mor, the Deputy Medical Superintendent at Max Superspeciality Hospital, Saket for their support and guidance. I wish to express my deep regard and gratitude to him, who inspite of his busy schedule took time to hear, guide and keep me focused by giving his helpful advice, constructive comments and encouragement throughout the project. His valuable inputs made this project possible.

I am also very thankful to all the staff of Max for their attention towards my work and helping me which greatly added to my project. The administrative and clinical staff of the hospital has been very helpful to me and I would like to express deep gratification to all.

Dr Akanksha Mamgain



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ABBREVIATIONS

S.No.	Abbreviation	Meaning
1.	SSC	Surgical Safety checklist
2.	WHO	World health organisation
3.	OT	Operation theatre
4.	OR	Operating room
5.	PAC	Pre anaesthetic check up
6.	MRI	Magnetic Resonance Imaging
7.	OPD	Out Patient Department
8.	ALOS	Average length of stay
9.	IPD	In patient department
10.	IPS	International patient services
11.	NABH	National accreditation board for hospitals and healthcare
12.	TAT	Turnaround time
13.	FFP	Fresh Frozen Plasma
14.	TTI	Transfusion transmitted infection
15.	LAMA	Leave against medical advice
16.	GDA	Ground duty assistant
17.	COW	Computer on wheels
18.	ABG	Arterial blood gas
19.	VED	Vital essential desirable
20.	EOQ	Economic order quantity
21.	HEPA	High efficiency particulate arrestance
22.	LINAC	Linear accelerator
23.	CT	Computerized tomography

OBSERVATIONAL LEARNING

Max Healthcare is the country's leading comprehensive provider of standardized and seamless healthcare services. It is committed to the highest standards of medical and service excellence, high care, scientific knowledge and medical education. Max healthcare has 14 facilities in north India, of this 11 are located in Delhi and NCR whereas the other three facilities are in Dehradun, Mohali and Bathinda. The Max healthcare includes state of art tertiary care hospitals at Patparganj, Shalimar Bagh, Vaishali, Mohali, Bathinda and Dehradun, Secondary care hospitals at Gurgaon, Pitampura and Noida and a speciality centre at Panchsheel Park. The company provides patient services including [nuclear medicine](#) and [cardioimaging](#), labs, scans, [interventional cardiology](#), [cardiac pacing](#) and [electrophysiology](#), [neurosciences](#), [orthopedics](#), [gynecology](#) and [obstetrics](#), [pediatrics](#), cancer care, kidney transplant, bone marrow transplant, maternity services, diagnostic services, [pediatric ophthalmology](#), neurophthalmology, internal medicine, general surgery, urology, nephrology, gastroenterology, mental health and behavioral sciences, rehabilitative services

Max healthcare is pioneer in the introduction of technology to provide patients with highest quality medical care examples are the Brain Suit in Asia at Max Saket. The hospital is equipped with advanced medical equipments in cath labs, robotics Ots with HEPA, Nuclear medicine, Gama camera, LINAC for radiotherapy, MRI and CT scan machines. Max healthcare had 2300 leading doctors, 3300 nurses, 3100 trained staff and 22, 00,000 patients from over 80 countries.

HISTORY

Max India Limited was founded in 1985. The first Max healthcare centre was opened as Max Multi Speciality Centre in Panchsheel Park, [New Delhi](#) with OPD facilities and day care surgeries in 2000.

Dedicated to mother and child care, Max Hospital, Noida was opened in 2002 with services including non-invasive cardiology, [orthopedics](#), [ENT](#), [ophthalmology](#), [nephrology](#) etc. Max

Heart and Vascular Institute were established in 2004 with advanced cardiac life support and air evacuation service in Saket.

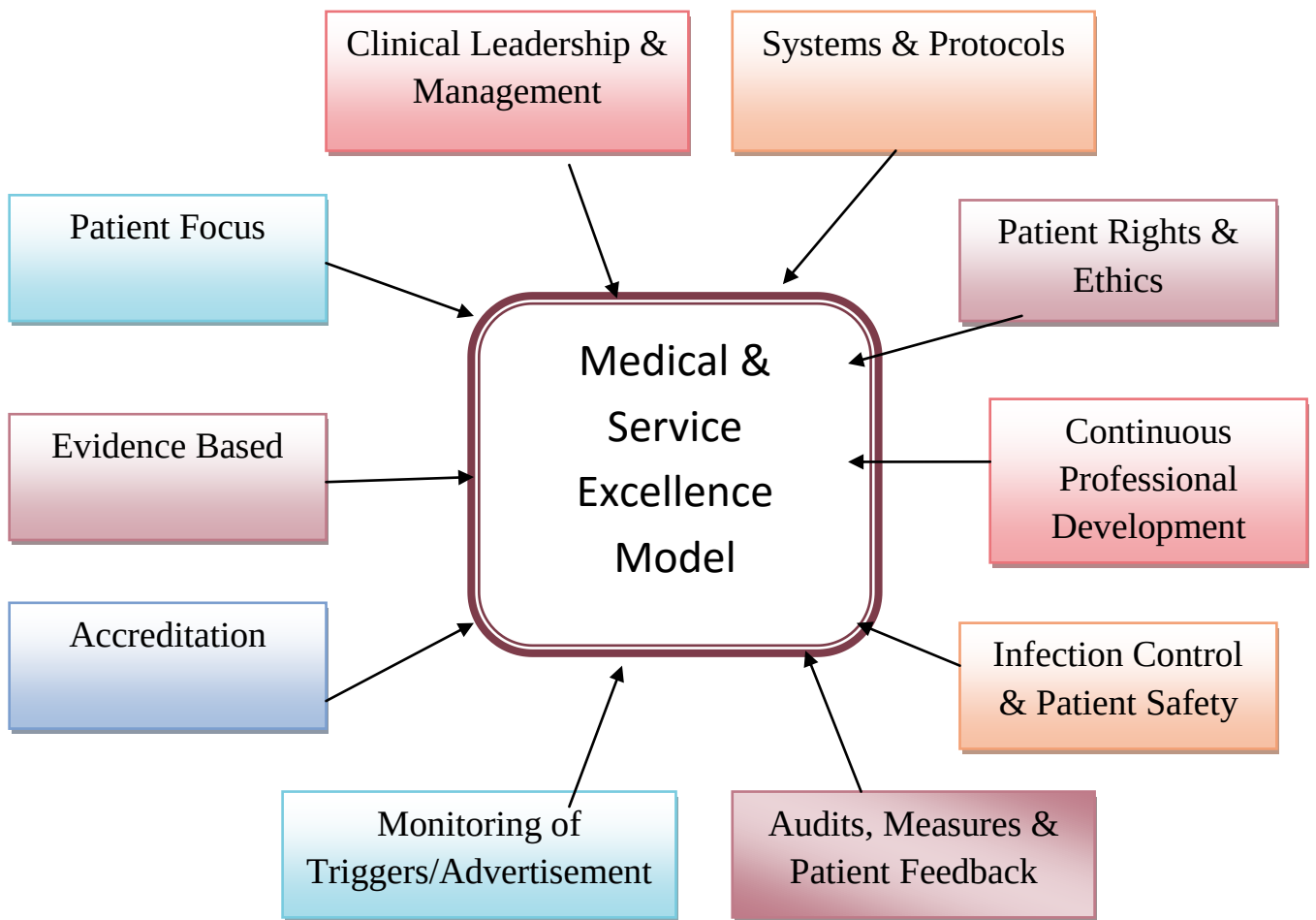
Max Hospital in Patparganj was founded in 2005. In the same year, Max Eye and Dental Care centre was opened at Panchsheel Park, New Delhi. Max Super Specialty Hospital in Saket was founded in 2006 and Max Hospital, Gurgaon was opened in 2007.

In July 2014 the company formed a joint venture with LIFE Healthcare Group, the second largest private hospital operator in South Africa, with the two groups each holding a 46.4% equity stake in the new venture to be known as Max India.

VISION

Our passion well reflects in the fact that we set the industry standards when it comes to cure, care and comfort. To deliver International Class healthcare with a total service focus, by creating an institution committed to the highest standards of medical & service excellence, patient care, scientific knowledge and medical education.

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



The pillars of this model include:

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

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

The hospital has four key areas of specialties:

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

MODE OF DATA COLLECTION

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

Sources of Data

➤ Primary

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

➤ Secondary

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

GENERAL FINDINGS

FRONT OFFICE

- **First contact point** between the patients / their attendants coming to the facility.
- Gives directions to them about the locations of various departments.
- Helps in planning timely discharge a day before by inquiring about the same from the concerned consultants.
- 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.

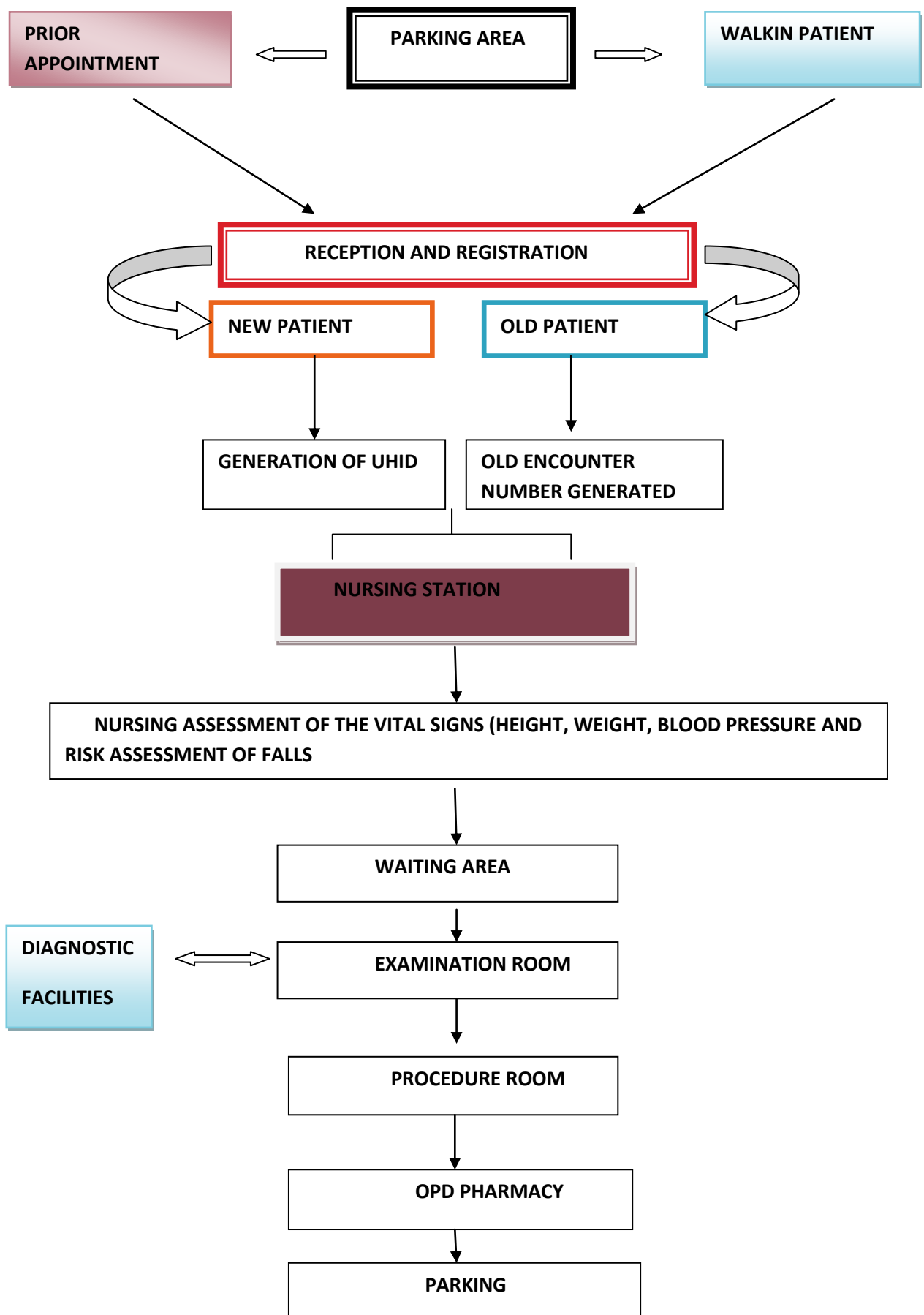
Challenges

- Shortage of staff
- Huge rush during peak hours such as morning

OUT-PATIENT DEPARTMENT

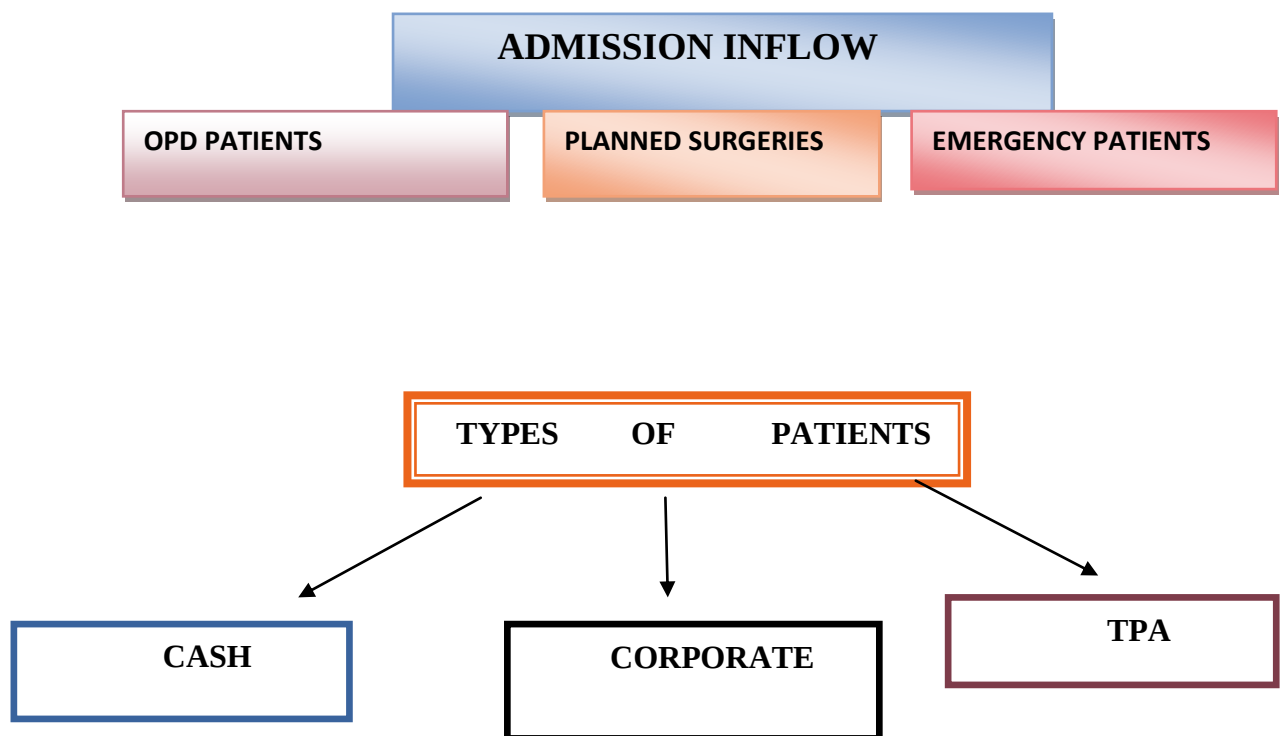
- Each INSTITUTE of Max Saket hospital has its own OPD area as well as IPD area / day-care area wherever applicable with doctor's chambers and procedure rooms.
- Every OPD has a procedure room and its own Front Desk.
- Appointments are centralized and are recorded on the Hospital Information Management System. As soon as appointments are fixed, a text message is sent to the patient confirming the appointment, and a reminder message is sent on the day before the appointment. No walk-in patient is turned away, and the staffs try to accommodate these patients between the appointments already scheduled for the day.
- Each OPD waiting area has the capacity to handle 70-100 patients waiting.
- In case of a new patient, registration is done which is valid pan-Max and for life time of the patient and a UHID is created which becomes a unique identification for all his health related information.
- For Chairpersons and senior doctors, a junior doctor does the initial assessment of the patient, which not only reduces the workload of the senior doctors (whose slots are always overbooked), but it also gives the junior doctors an opportunity to learn from the best brains in the indu

THE GENERAL PROCESS OF OPD FLOW 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 dont's as well as patient's rights and duties are explained to him. An initial token amount is deposited here by the patient which is according to his preference of the room (be it economy , single , twin sharing or suite)
- In case of TPA patients, the admission has to be reported to the insurance company within 24 hours.
- STAFF – 70-80; work in shifts with TPA staff working only from 5-5.
- ISSUES- Huge departmentalisation, which causes co-ordination problems

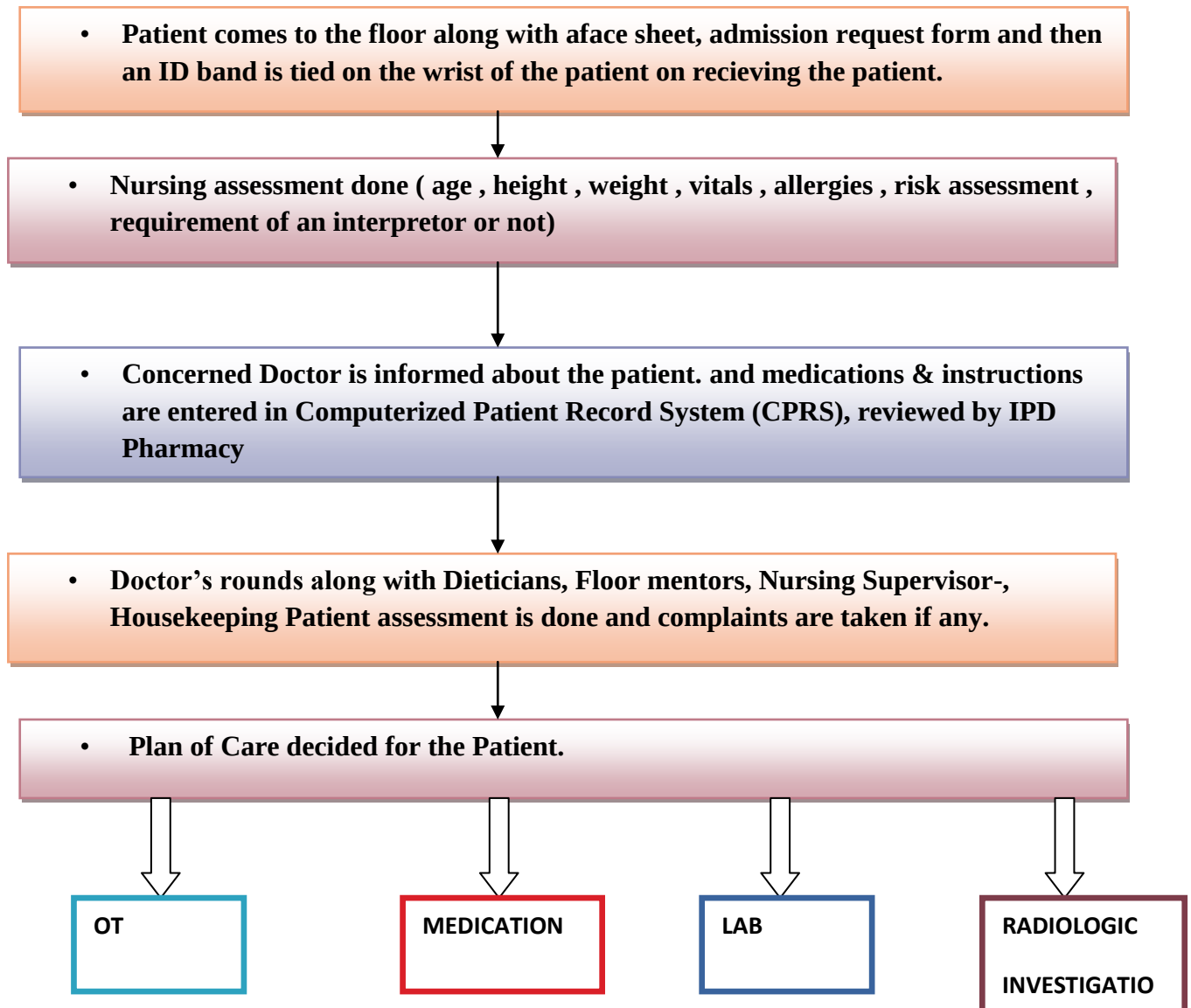


IN-PATIENT DEPARTMENT (IPD)

- IPD is distributed over four floors (3rd-6th) in the east wing and over five floors (2nd-6th) of west wing of Max hospital including a total number of 539 beds.
- Every bedside has:
 - **Details of Consultant, Nurse and Mentor written at the top of every bed**
 - **Room equipment checklist – side rails, Oxygen, Suction**
 - **Important Instructions**
- The rooms available in IPD have the following structure of beds per room:
 - **Economy room – 4 beds per room.**
 - **Twin Sharing – 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)
 - **Crash Cart parked next to the nursing station**
 - **Computer on wheels (COW) - 4**
 - **Cupboards with forms- down time form, investigation track sheet, blood request form, PAC sheet, informed consent, inventory files and registers**
 - **Medication rooms – 2 ;Pantry – 1**
 - **Records room**
 - **Biomedical Waste Disposal**

- Nurse to bed ratio = 1:5 or 1:6
- General Duty Assistants (GDAs) = 2-3 in every shift
- Average Length of Stay (ALOS) for normal Laparoscopic surgeries = 2-3 days
- Quality Indicators are: Patient Fall, Hypoglycaemia, Needle stick Injury
- Process of admission of new patient to IPD

IPD PROCESS FLOW



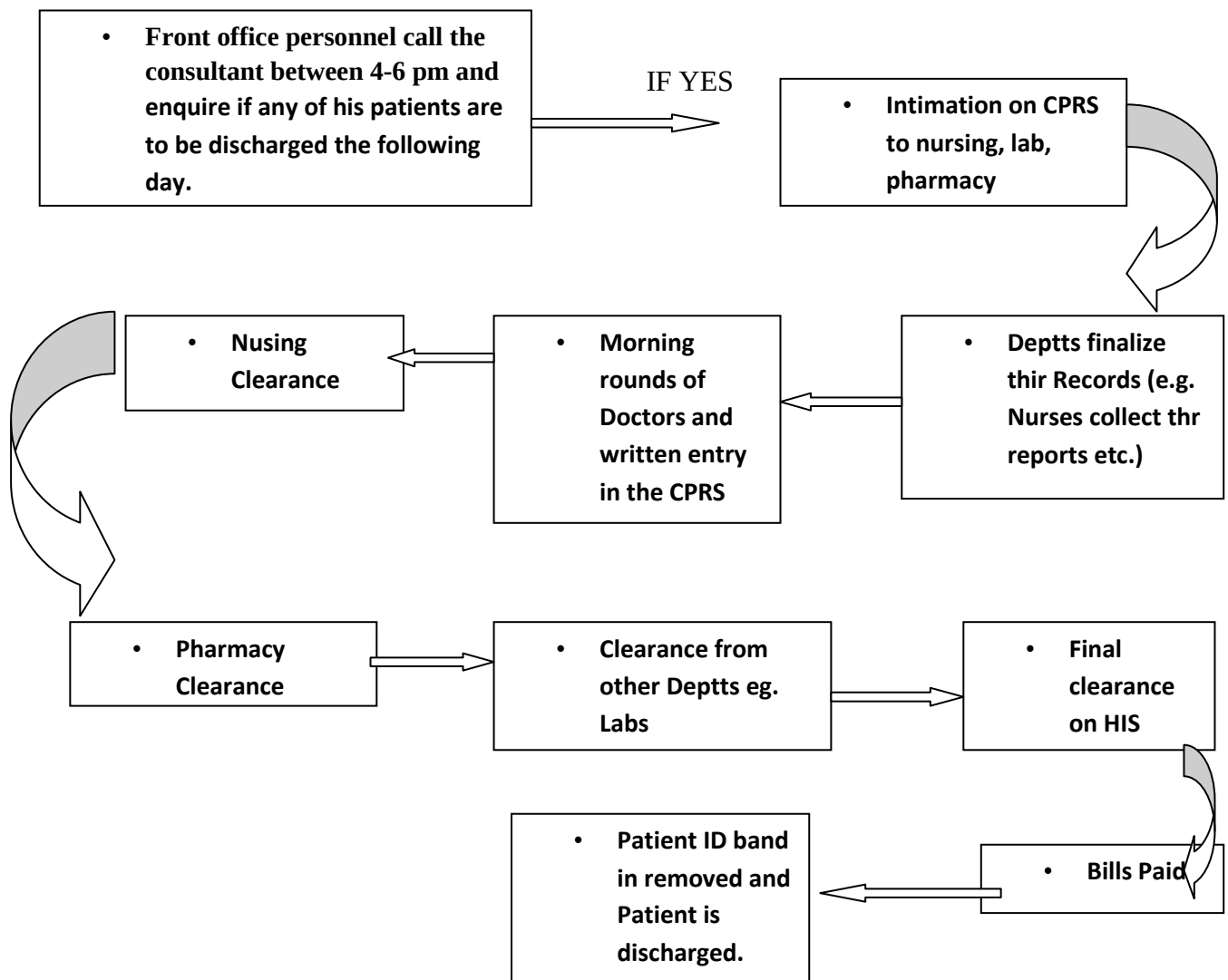
❖ **BARRIER NURSING-**

Isolation of the patient in case the blood or urine culture of the patient has been tested positive for any infection so that the infection does not spread to others.

❖ **REVERSE BARRIER NURSING-**

Done in cases where patient is immuno compromised so that infection does not travel to him from others.

THE PROCESS OF DISCHARGE FROM IPD:



EMERGENCY DEPARTMENT

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

Ambulance - 2 ACLS (with CCTV camera for telemedicine, Suction Cardiac Monitor, Defibrillator, Oxygen Pump) and 2 BCLS (Ferno Stretcher, Oxygen Pump)

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

Response time:

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

Infrastructure:

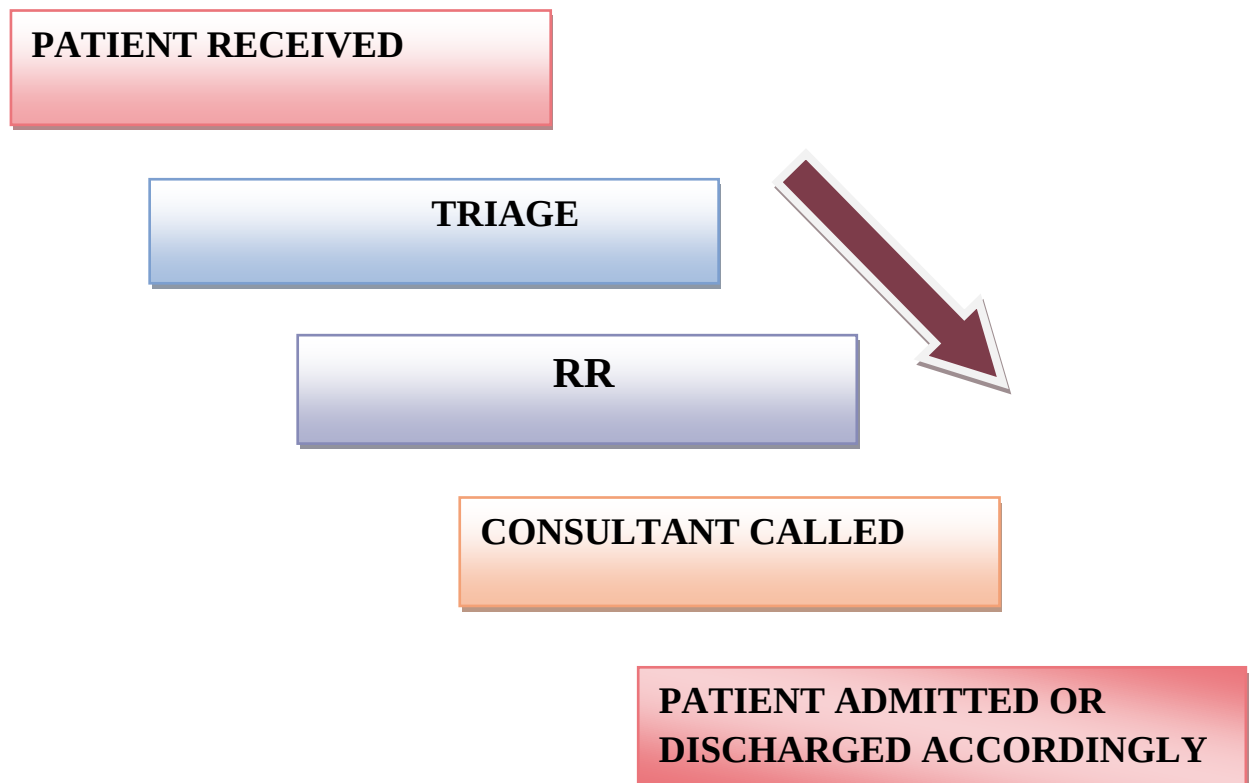
- Total 16 bedded triage
- Resuscitation suite -1 bed
- Urgent care area – 4 beds
- Observation area – 9 beds
- Clinical decision unit – 2 beds
- Doctors work station-is located in the centre of the urgent care area
- Store room- is located behind the reception. Medications are filled twice a day and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

- COWS(computer on wheels)
- Waiting area for patient's attendants is outside the department.

Staffing:

1. Senior consultant (Emergency medical officer)
2. 4 doctors
3. Team leader
4. Emergency physicians - 3
5. Nurses : 32 (8 nurses per shift)
6. 2 personnel at reception
7. Paramedical staff for ambulance
8. 4 GDA per shift
9. Outsourced staff: security personnel.

PROCESS FLOW



OPERATION THEATER COMPLEX

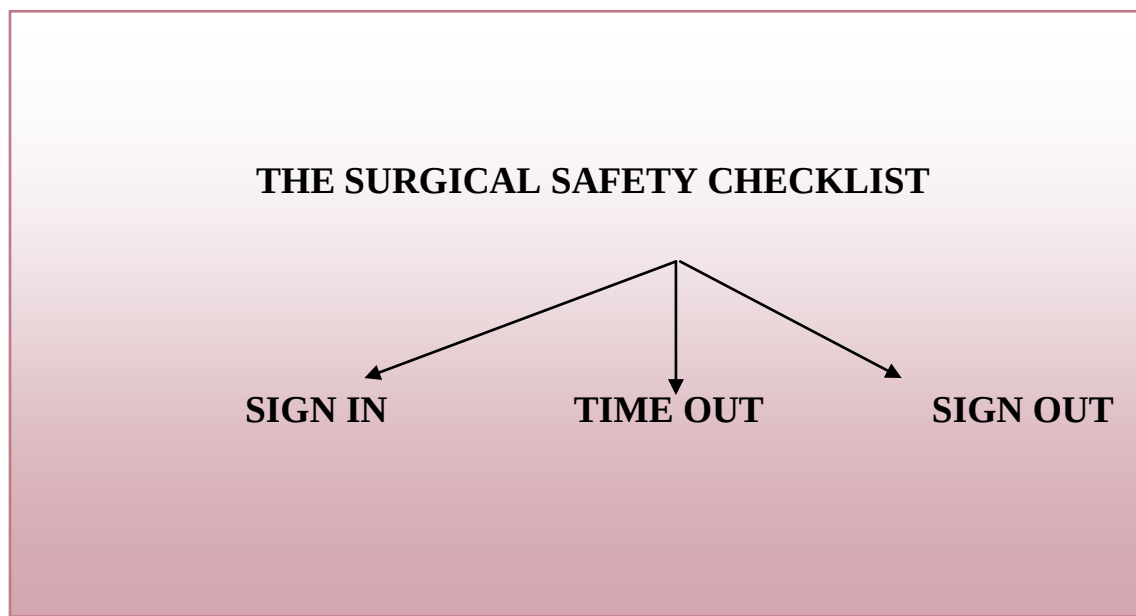
Operation theatre complex of East wing is located on first and second floor. Operation theatre complex has 11-operation theatre assigned to various departments. Cardiac, oncology, bariatric laparoscopic, gynaecology, ENT and plastic surgeries are performed in these operation theatres. Operation theatre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

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

Anaesthetist and surgeon, nursing staff, technician, supportive staff.

- Average number of cases done per day – 30 in each wing
- 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).
- Staffing ratio- Nurses : patients – 4:1(pre-op) ; 2:1(post-op)
Technicians: patients- 1:1
- OT Utilisation – average is 70%
- Max super speciality hospital recently got a GREEN OT certificate which signifies minimal amount of pollution caused by OT gases and acceptable standards of practices being followed here.
- Sterilisation is done by ETO (12 hrs); autoclave. Fumigation is done twice a day in the morning and evening.
- Bio medical waste disposal is done every 2 hours.
- No. Of pre-op beds -3
- No. of post-op beds -4

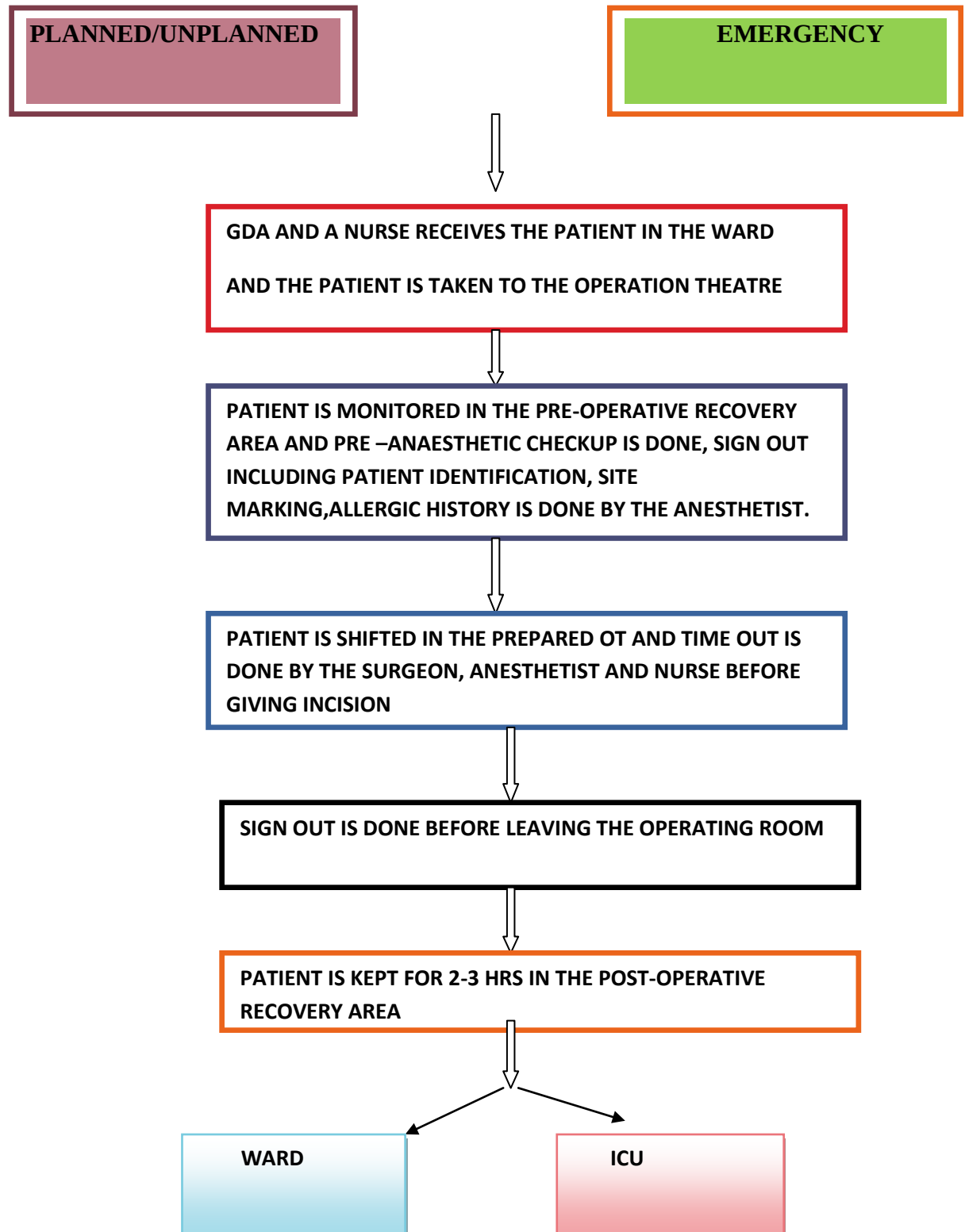
- The maintenance of patient safety is an important concern for the hospital. Max Hospital; Saket also follows WHO's Surgical Safety Checklist to keep an eye on the standards to be followed in the process flow of surgery for the safety of its patients. The surgical safety checklist has three important elements: the sign in, before induction of anaesthesia, the time out, before giving an incision inside the operating room and sign out, before leaving the operating room.



Quality indicators:

- **wrong patient**
- **wrong surgeon**
- **wrong surgery**
- **return to OT(within 7 days)**
- **waiting time for OT**

PROCESS FLOW IN THE OPERATION THEATRE COMPLEX



GREEN OT CERTIFICATION

Green OT certification was undertaken with an object to promote sustainable healthcare delivery using green and safe practices in the operation theatres.

Green OT protocols focuses on the below mentioned factors which influence the activities in the operation theatre.

- Types of anaesthetic agents used
- QA safety norms followed by operation theatre.
- Scavenging systems used
- Ventilation systems
- Anesthesia filling system
- Other relevant factors

Currently in the MHC network, two Max Hospitals are Green OT certified.They are
Max Superspeciality Hospital, Saket.

Max Superspeciality Hospital, Shalimar Bagh

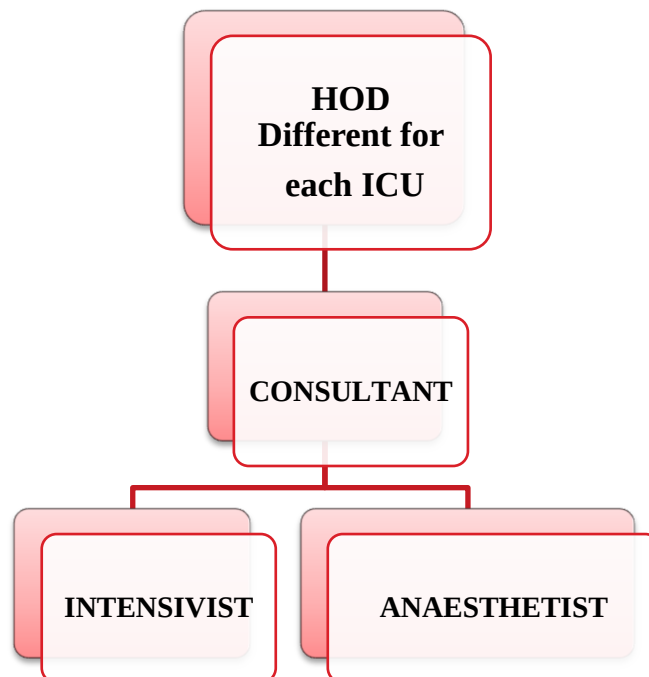
INTENSIVE CARE UNIT (ICU)

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

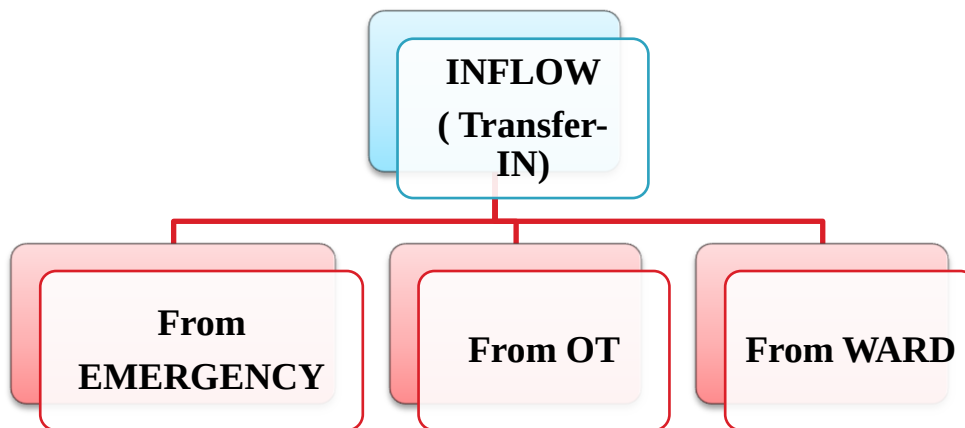
1. Respiratory ICU – 8 Bedded
2. Medical ICU – 8 Bedded
3. Neonatal ICU – 8 Bedded
4. Apex Coronary Care - Bedded
5. Stroke and Neuro Medical ICU - Bedded
6. Neurosurgical ICU – 8 Bedded
7. CTVS ICU - Bedded

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

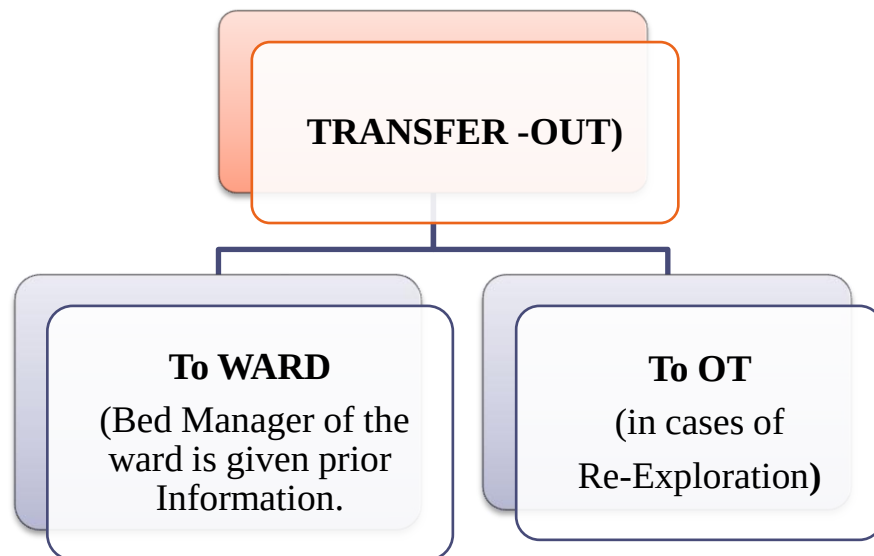
Hierarchy



Patient Flow



Before hand information is given on call to the ICU for *transfer-in* of the patient



- Patient: nurse – 1:1(for all patients)
- Patient counselling – done throughout the day; Relative counselling – done twice a day by the Intensivist.
- Protocol for infected patients –
 - Isolation

- Visitor's policy- no visitor allowed inside the isolation room
- Aseptic policy
- Full PPA
- Separate linen disposal in separate bags
- Separate dressing trolley
- Separate housekeeping material- dusters, mops etc
- **Quality indicators-**
 - **Patient falls**
 - **Bed sores**
 - **Medication error**
 - **Nosocomial infections**

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

CATH LAB

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

Diagnostic procedures performed here are:

- Angiography
- Electrophysiology study
 - Cath study

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

Other procedures are:

- Percutaneous Transluminal Coronary Angioplasty
- Peripheral Transluminal Angioplasty
- Radio Frequency Ablation
- Permanent Pacemaker Implantation
- Intra Cardiac Defibrillation

- Cardiac Resynchronisation Therapy Defibrillator Device
- Cardiac Resynchronisation Therapy Pacemaker
- Left and right sided pressure studies
- Closure of some [congenital heart defect](#)

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

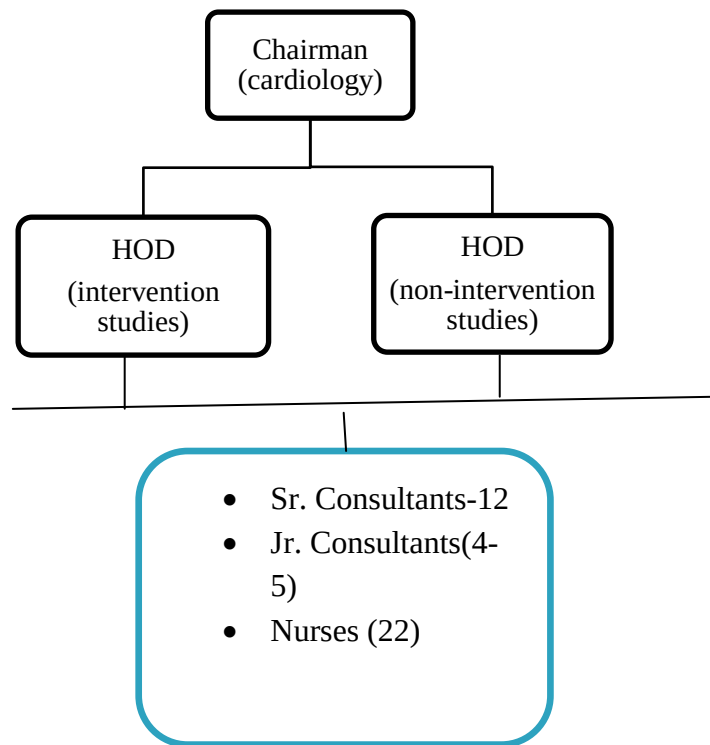
Units of cath lab:

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

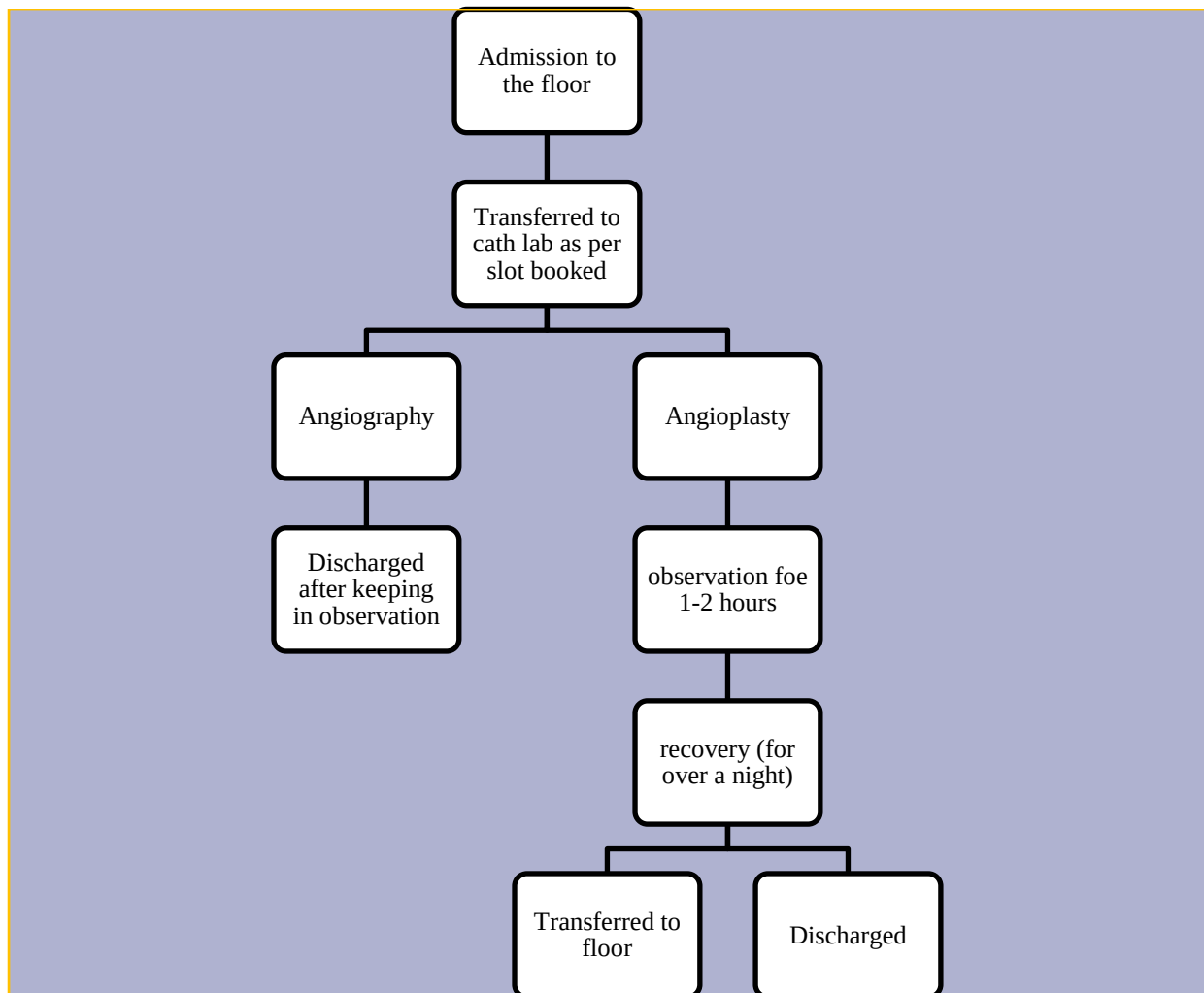
Location: Cath lab is located on the first floor with the vicinity areas as

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

Staff



FLOW OF THE PATIENT



DEPARTMENT OF LAB SERVICES

INTRODUCTION-

An ISO 9001:2000 certified lab, it is open 24 hrs a day. It's a high-tech lab with fully automated instruments which are directly interfaced with **hospital information system** and **laboratory information system**. Facility of stat tests (emergency) and sample collection from home is also available.

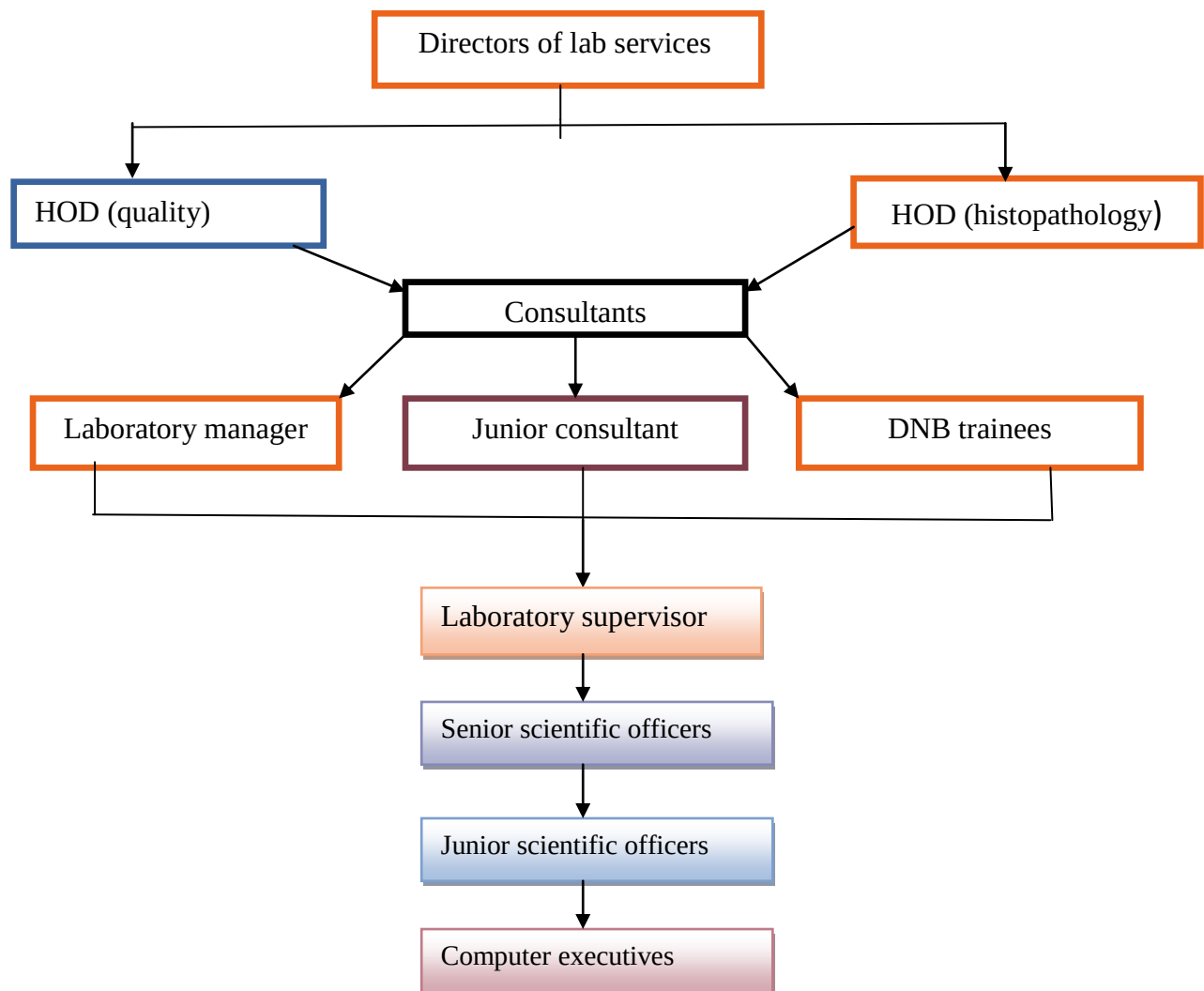
LABORATORY COMPRISES OF THE FOLLOWING DEPARTMENTS-

- Biochemistry
- Haematology
- Immunoassay

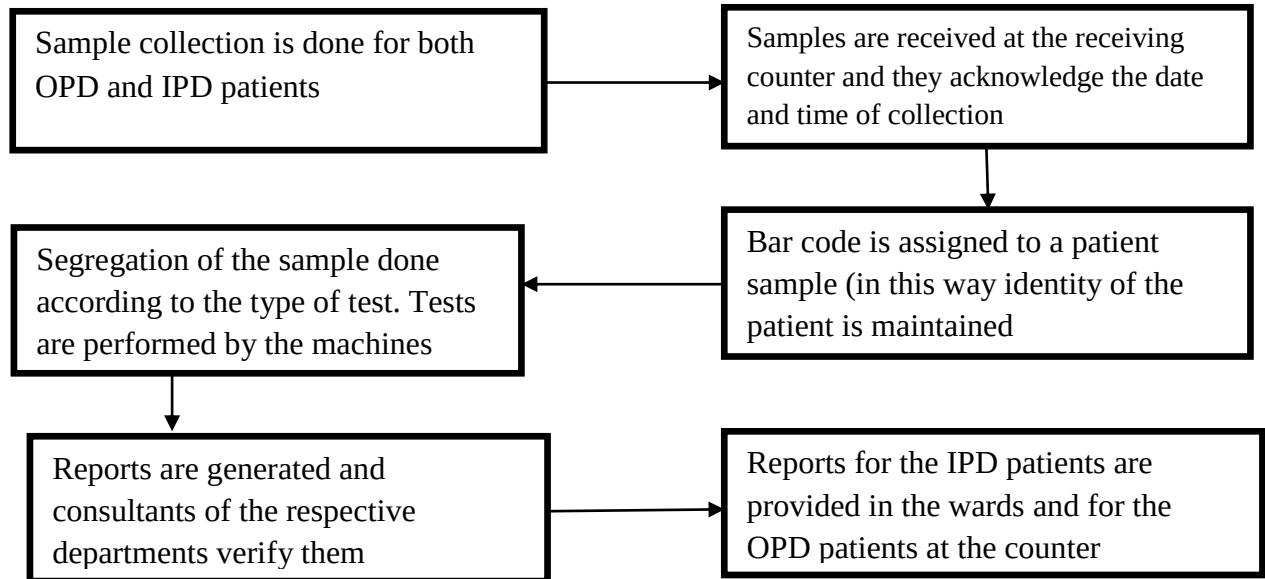
- Histopathology
- Clinical pathology
- Serology
- Microbiology

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

- Lab medicine
- Histopathology



PROCESS FLOW-



LABORATORY INFORMATION SYSTEM-It is connected with hospital information system

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

RADIOLOGY DEPARTMENT:-

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

The total 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 & colour) e.g. 2 D echo, vascular studies, etc

3) Mammography

4) Dexascan

5) Special imaging techniques

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

Divided into two parts:-

- 1) For Ultrasonography, mammography, Dexascan
- 2) For CT scan, MRI, X-ray, fluoroscopy

Consist of:-

- 1) Reception:-Counter for appointment and billing

- 2) Waiting room with general facilities like toilets, drinking water, air conditioning
- 3) Diagnostic room
- 4) Counseling room
- 5) Changing room
- 6) Film processing room
- 7) Radiologist office
- 8) Report collection room

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

Timings for OPD patients:-8am to 8pm

In between this IPD and Emergency patients are also taken.

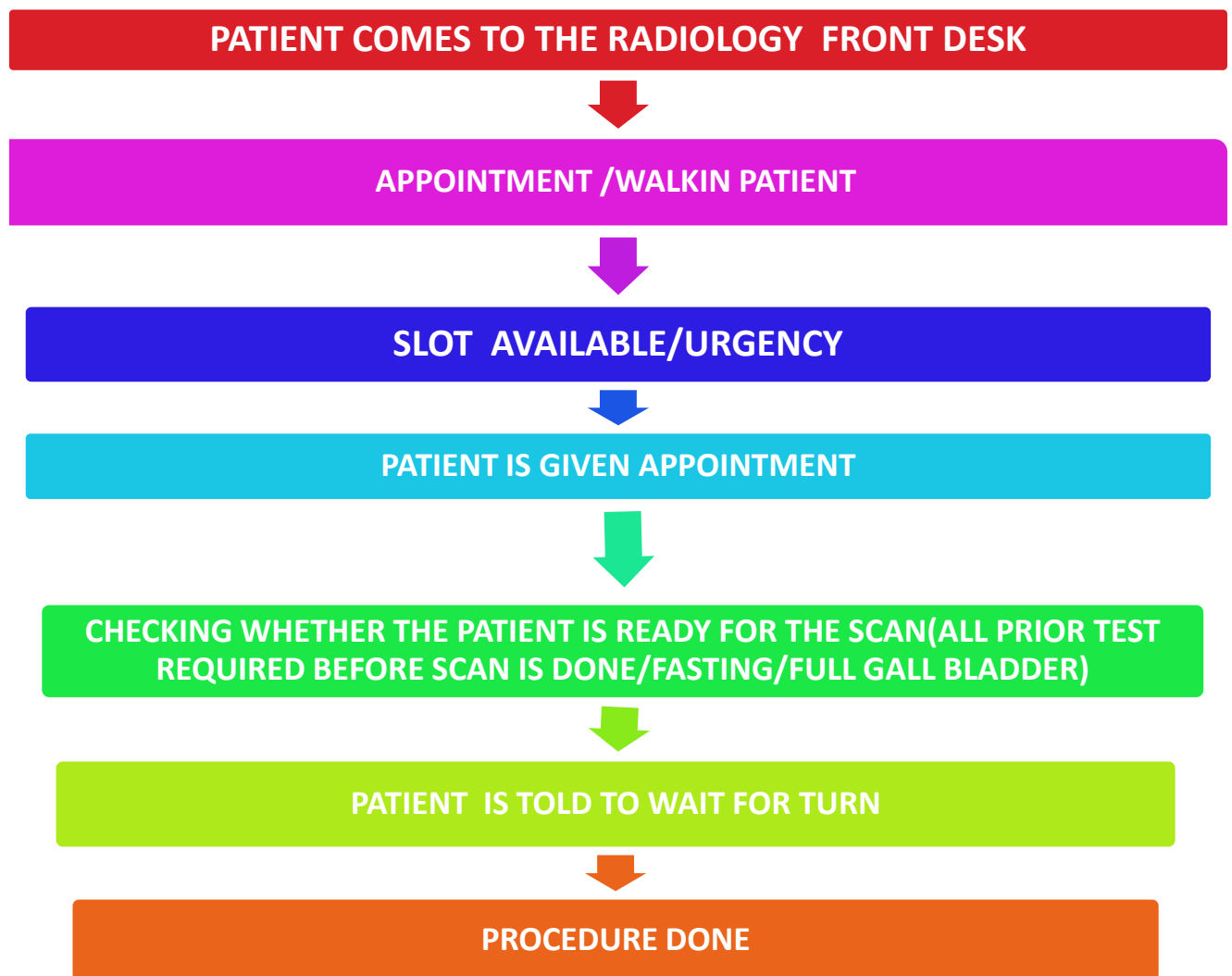
Main OPD hours: - 8am to 6pm and after 8pm only IPD and Emergency patients are taken

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

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

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

Process flow in radiology department



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

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

BLOOD BANK

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

Blood bank consist of

1. Sample collection area / reception area: In reception area, a form is given to the attendant of the patient regarding their details before he/ she donates the blood.
2. Aphaeresis area: blood have several components including red blood cells platelets and Plasma. Donor aphaeresis is a special type of blood donation in which a specific component platelet, plasma is withdrawn from donor
3. Component room: In component room, the whole blood is separated into packed cells FFP and platelets.
4. TTI room: It is to diagnose transfusion-transmitted infections. If donor is detected positive for TTI status it means donor have the potential to transmit the infection to their partner and children.
5. Issue room: This room is to issue the screened blood bags.

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

- Dr.Sangeeta Pathak heads the Department and the technical manager is Ms. Ruchi.
- The blood donation timings are from 9am to 5pm and approximately one volunteer comes for donating blood. Blood can be donated after every 3 months.

- The PRBC are stored for 45 days at 2-6 degree Celsius.
- The Platelets are stored for 5 days at room temperature 22± Celsius.
- The FFP (Fresh Frozen Plasma) are stored for 1 year at -40 degree Celsius.

CENTRAL STERILIZATION SERVICE DEPARTMENT

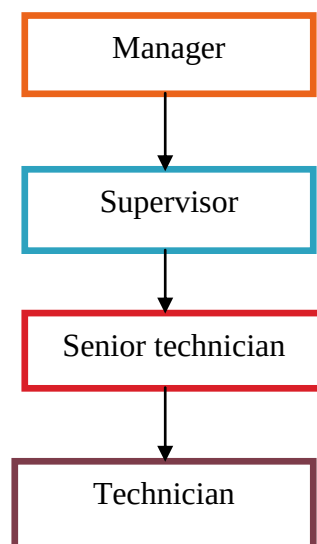
INTRODUCTION-

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

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

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

HIERARCHY OF THE DEPARTMENT-



Dr. Sanjeev Bhatia heads the Department.

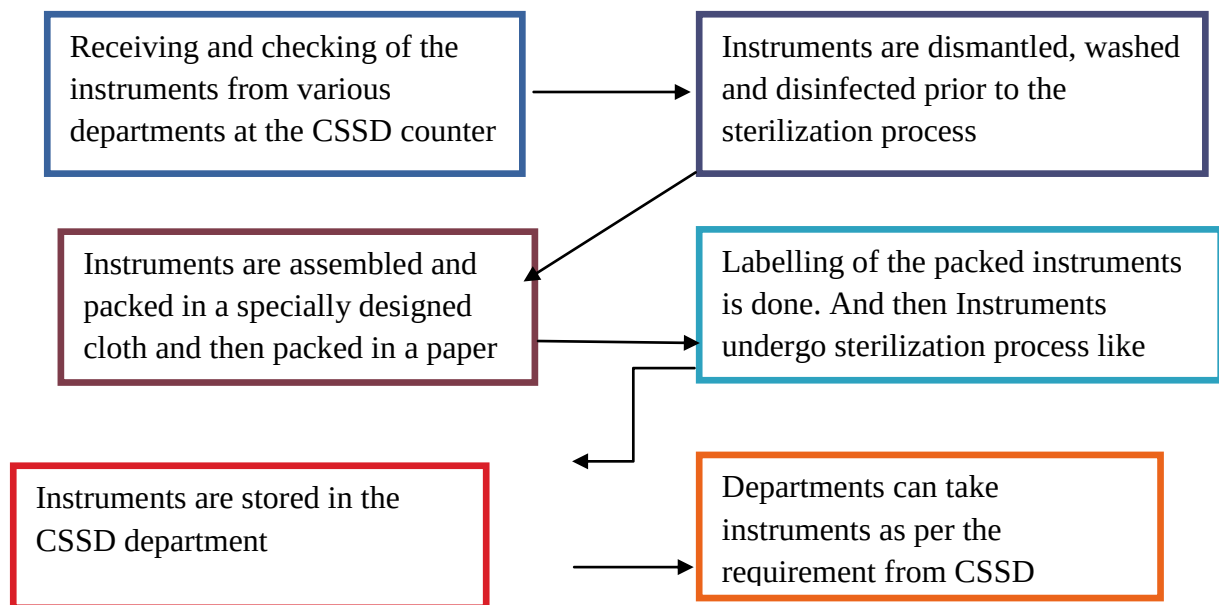
ZONES PRESENT-

- **Decontamination**
- **Clean**
- **Sterile**

Colour coding for the following zones -

- **Decontamination area-red colour**
- **Clean area-blue colour**
- **Sterile area-green colour**

PROCESS FLOW-



- At the time of receiving the instrument at the CSSD department, the instruments are counted, checked for any damage, segregated according to the method of sterilization required for the instrument.
- Instruments used for the washing of the instruments are fully automated and according to the European standards.
- For packing of the instruments medical grade paper and cloths are used which are specifically designed for the purpose(they have a zig -zag pattern)
- Once sterilized and packed instrument can be used within 6 months.

EQUIPMENT LIST-

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

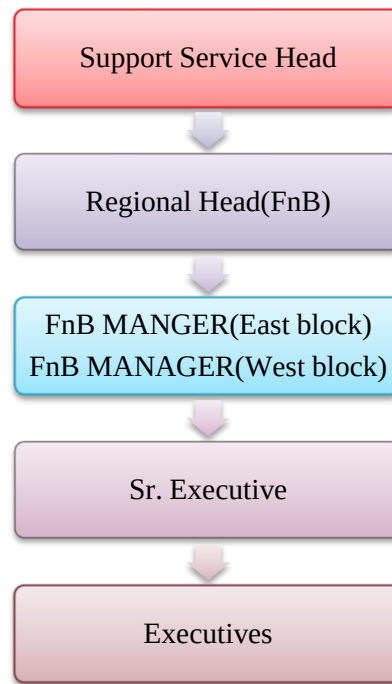
QUALITY INDICATORS-

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 for arranging food during various meetings and conferences in the hospital.
- 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

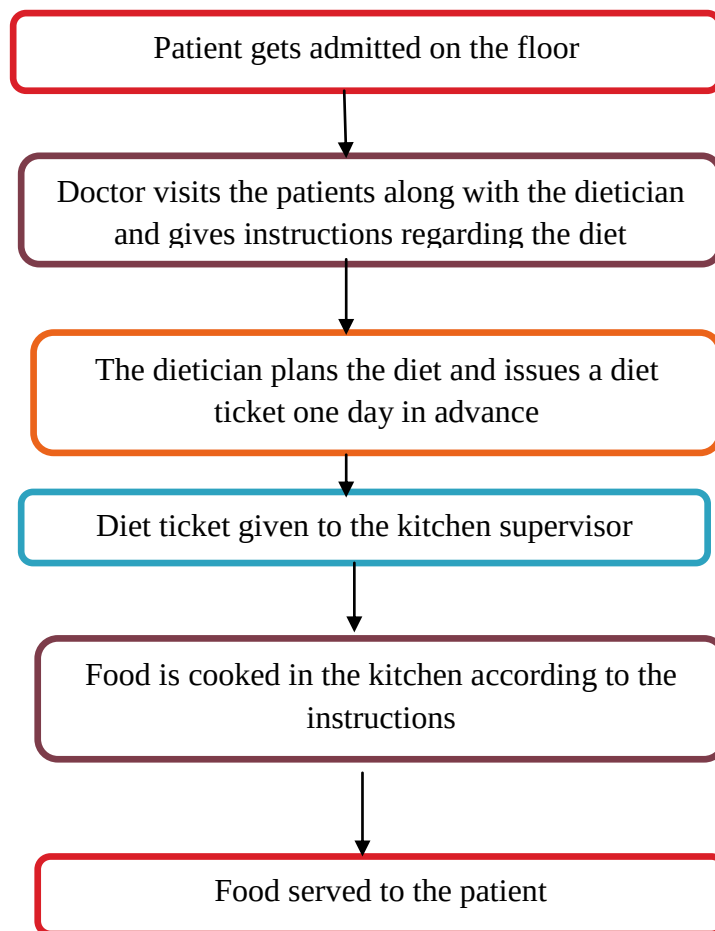


Time table for the diet of the patient

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

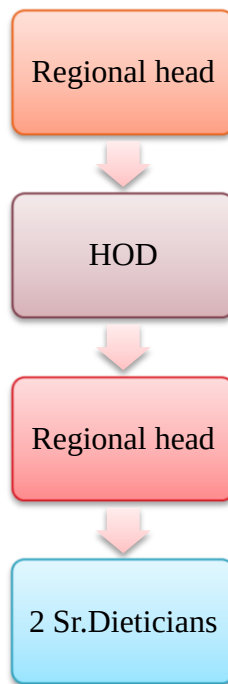
- Dinner of the same day, breakfast and lunch of the next day are decided prior in the evening and diet tickets are issued by the dietician and given to the chef.
- Apart from these if patients wants to have something extra, those can be provided to the patient after consulting dietician, but for an extra charges.
- Different menus offered are:
 - Continental
 - Afghani – for middle east patients
 - No onion and garlic – for middle east patients
 - Indian

- **Process flow** of the department



DIETETICS

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

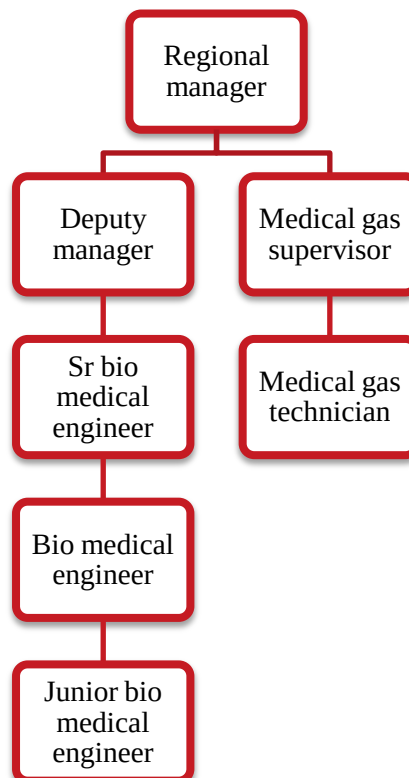


- Dietician: patient – 1:50
- Assessment of each patient to be done within 24 hours of admission and thereafter every 8th day after initial assessment.
- For enteral nutrition, all commercial supplements for each disease are available.

BIOMEDICAL ENGINEERING

- This department deals with purchase, installation and commissioning, training on operating, handling and maintenance of medical equipment in all departments of the hospital.
- Looks after running equipment and new equipment.
- For Running equipment
 - Preventive maintenance is done – to prevent breakdown, maintenance is done.
 - Calibration is done – i.e. to check how accurate an equipment is functioning
 - Breakdown call is checked for
 - Depreciation is measured
- For new equipment
 - Installation and commissioning is done.
- AMC and CMC records are maintained.

- CAPEX (Capital Expenditure) and OPEX (Operating Expenditure) registers are maintained.
- Equipment Incident report is made in case of any physical damage – it is filled mentioning how the damage did happened. Thereafter replacement or repair whatever is required is done.
- Organisational chart



- This department also handles gas manifolds and Max is awarded green OT certificate because of the efficient dispersion of OT gases.

PHARMACY

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

PURCHASE

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

STORING OF DRUGS

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

INDENT AND DISPENSE OF MEDICATIONS.

In patient pharmacy-

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

NARCOTICS DRUGS

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

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

LOOK ALIKE AND SOUND ALIKE DRUGS

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

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

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

Licences acquired by Max hospital pharmacy -

- 1) Pharmacist License
- 2) Narcotics License

INVENTORY MANAGEMENT PARAMETERS

I. ABC Class

A Items: 7 days

B Items: 10 days

C Items: 15 days

II. EOQ - (economic order quantity)

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

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

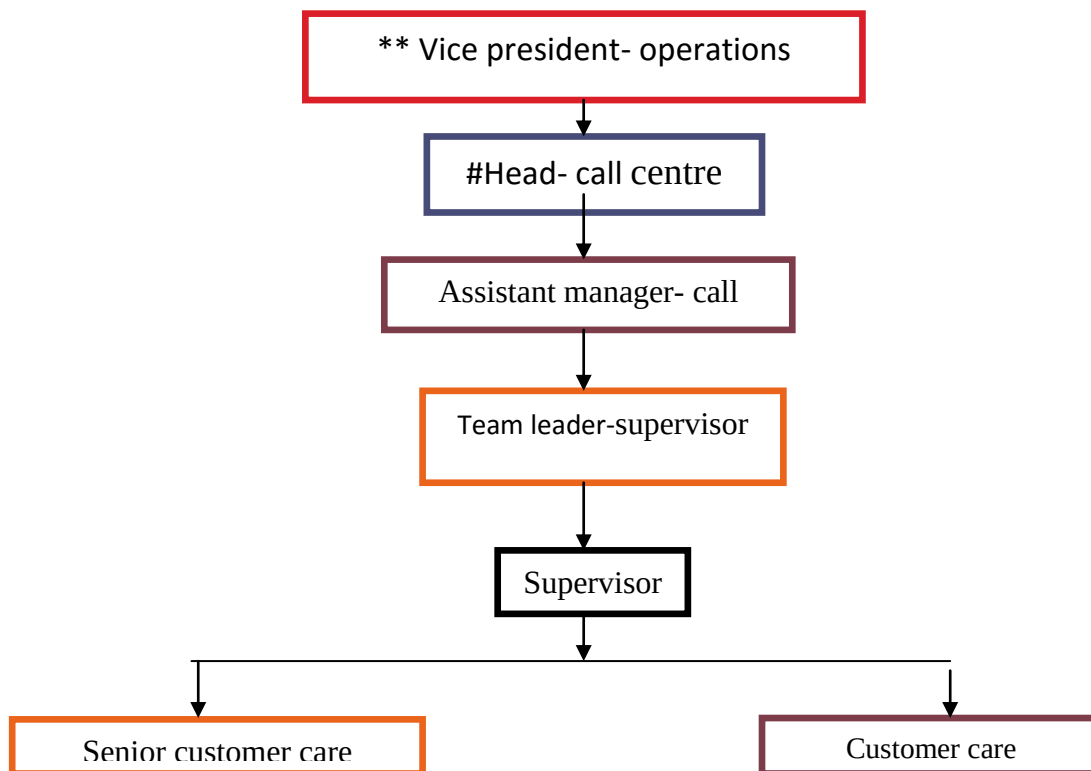
CALL CENTRE

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

Call centre deals with:

- Doctor's appointment
 - Health check ups
 - Radiology and diagnostic appointments
 - Patient's information
 - Doctor's information
 - Employee's information
 - Speciality information
 - Other department information
 - It handles internal emergency e.g. Blue code
- Main board line number is 26515050

Organization chart:



SECURITY DEPARTMENT

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

Functions of Security Department:-

1. Security management:-

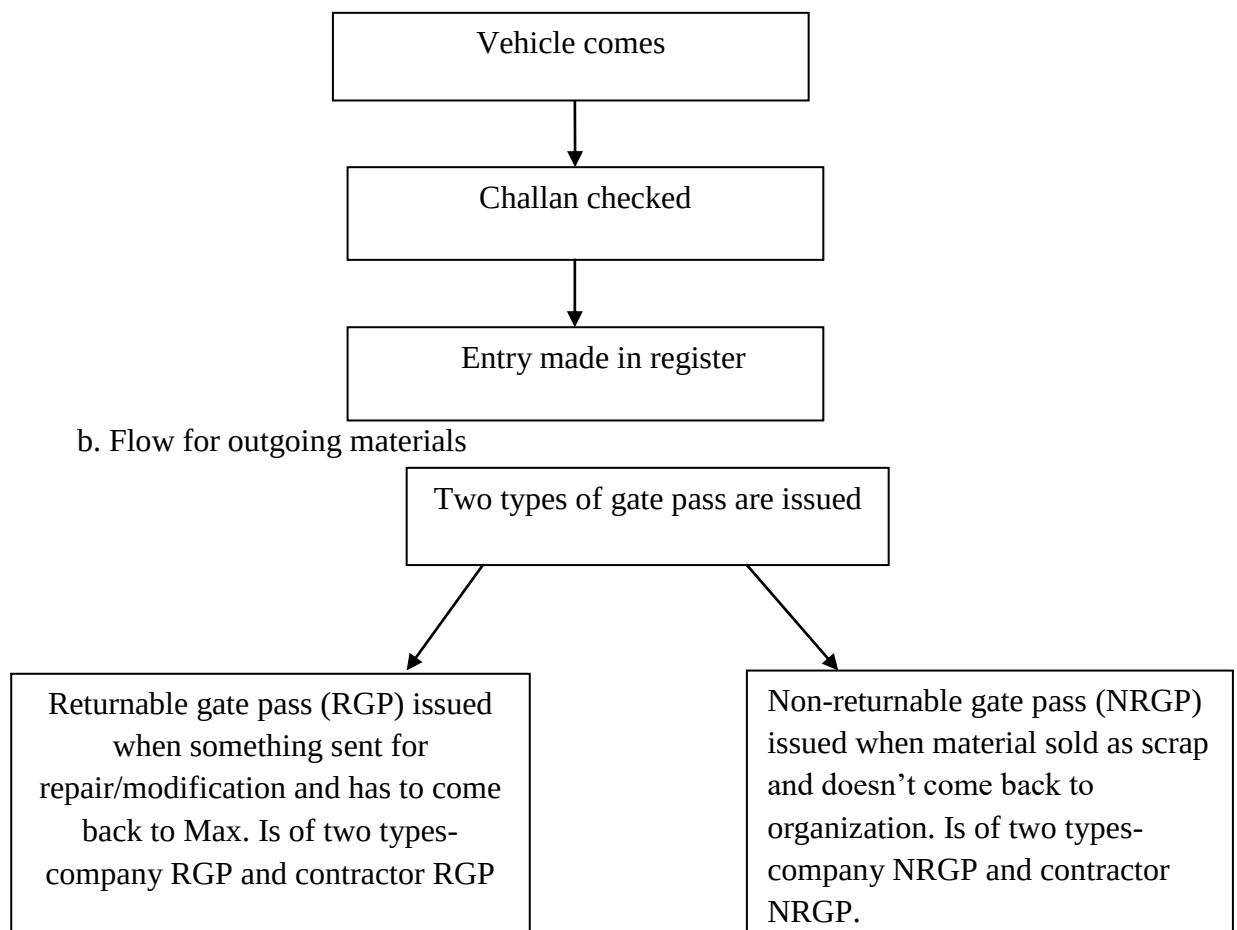
- Selection of people(guards and supervisors)
- Deploying of security staff to different floors and departments
- Checking of people entering hospital
- Turnout and grooming of security staff

- Training of security staff
- MLC handling
- Dispute handling

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

a. Flow for incoming materials:-The incoming materials are received either from a company or a contractor to Max.

The process flow is as under:-



3. Disaster management:-

There are six emergency codes:-

1. Red- Fire

2. Black- Bomb threat

3. Blue-Cardiac arrest

4. Yellow- External disaster like earthquake

5. Violet-Violent patient

6. Pink- Missing patient

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

Walkie talkies are an important source of communication.

Other disasters include floods, water logging, terrorist attacks.

4. Valet management:-

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

HUMAN RESOURCE MANAGEMENT

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

CORE VALUES

EXCELLENCE

CREDEBILITY

SEVAA BHAAV

HUMAN RESOURCE MANAGEMENT IN MAX HOSPITAL WORKS IN FOUR AREAS

TRAINING AND DEVELOPMENT

RECRUITMENT AND SOURCING

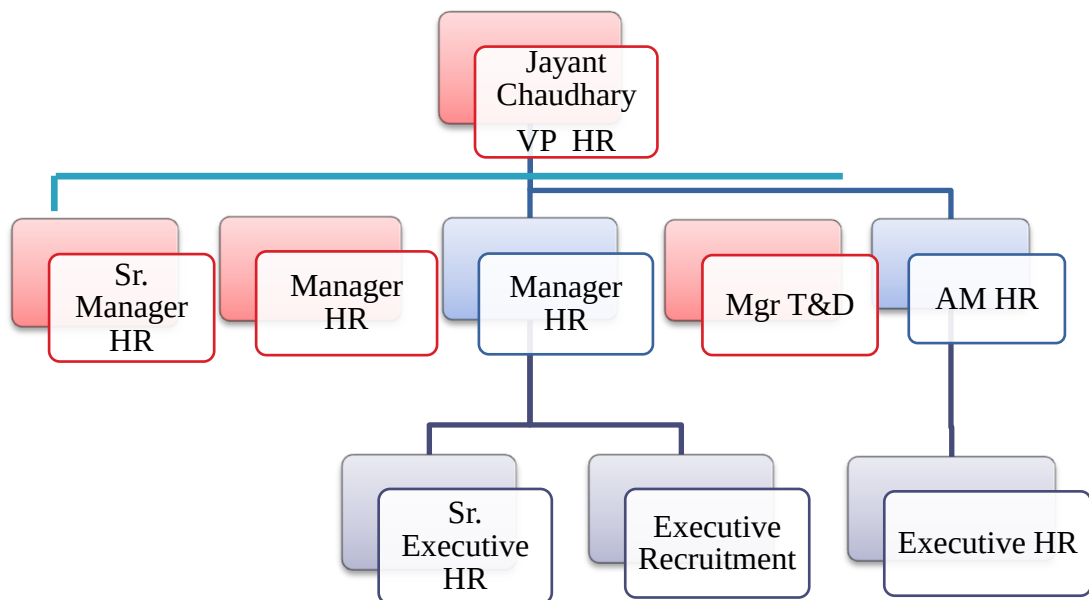
HR OPERATIONS

HR BUSINESS PARTNERS

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

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

HR Structure



INTERNATIONAL PATIENT SERVICES (IPS) DEPARTMENT

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

Contact Procedure:

- Patient sends a query and/or reports
- IPS Team consults the relevant consultant and provides diagnosis, proposed treatment and estimate
- If required, a telephonic meeting may also be arranged
- Patient confirms if he wants to have treatment at Max Healthcare to provide Visa Facilitation Letter

- Patient confirms the arrival date and time
- IPS Team, in the meantime, books room, OT etc. for the patient
- Patient is received at the Airport and then, brought to the Hospital/Guest House/Hotel

Also, another contact procedure is as follows:

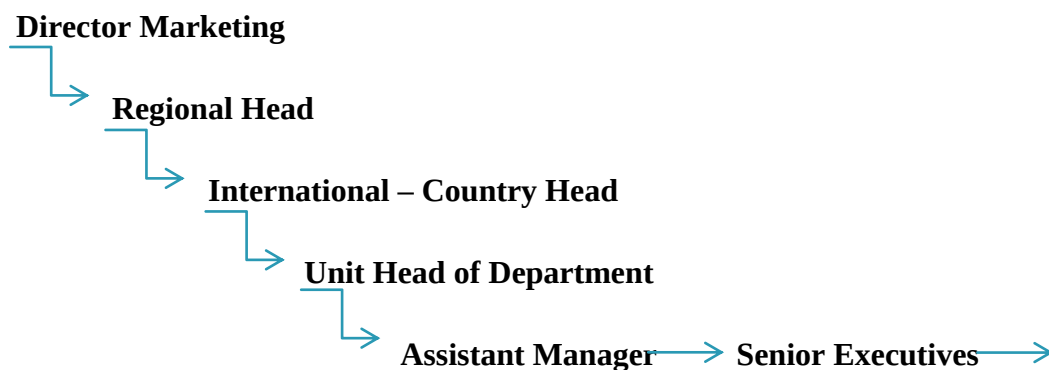
- Max hospital conducts free outreach OPDs in other countries, at least 1-2 per year
- Max hospital also has tie ups with different hospitals in these countries

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

The hospital provides:

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

Staffing:





A

Study on

The surgical safety checklist compliance

In west wing operation theatre complex

At Max Hospital, Saket, New Delhi



DECLARATION

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

I would like to state that I have carried out my Internship on the topic “**A study on the Surgical Safety Checklist compliance in West block Operation Theatre**” under the guidance of Dr. Sandeep Mor (Deputy Medical Superintendent) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfillment for the degree of MBA in Hospital and Healthcare Administration

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

Dr.Akanksha Mamgain

IIHMR University

(2015-2017)

INTRODUCTION

Surgical care has been an essential component of health care worldwide for over a century. As the incidences of traumatic injuries, cancers and cardiovascular disease continue to rise, the impact of surgical intervention on public health systems will continue to grow. Surgery is often the only therapy that can alleviate disabilities and reduce the risk of death from common conditions.

Every year, many millions of people undergo surgical treatment, and surgical interventions. While surgical procedures are intended to save lives; unsafe surgical care can cause substantial harm. Given the ubiquity of surgery, this has significant implications:

- **the reported crude mortality rate after major surgery is 0.5-5%;**
- **complications after inpatient operations occur in up to 25% of patients;**
- **in industrialized countries, nearly half of all adverse events in hospitalized patients are related to surgical care;**
- **at least half of the cases in which surgery led to harm are considered preventable;**
- **Mortality from general anaesthesia alone is reported to be as high as one in 150 in some parts of sub-Saharan Africa.**

WHO has undertaken a number of global and regional initiatives to address surgical safety. Much of this work has stemmed from the **WHO Second Global Patient Safety Challenge “Safe Surgery Saves Lives”**. Safe Surgery Saves Lives set about to improve the safety of surgical care around the world by defining a core set of safety standards that could be applied in all WHO Member States. To this end, working groups of international experts were convened to review the literature and the experiences of clinicians around the world. They reached consensus on four areas in which dramatic improvements could be made in the safety

of surgical care: surgical site **infection prevention, safe anaesthesia, safe surgical teams and measurement of surgical services.**

The checklist essentially identifies three distinct phases of an operation, each corresponding to a specific period in the normal flow of work: **Before the induction of anaesthesia, before the incision of the skin, and before the patient leaves the operating facility. In each phase, a 'checklist coordinator' must confirm that the surgical team has completed the listed tasks before it proceeds with the procedure.**

The intention of such a checklist is to systematically and efficiently ensure that all conditions are optimum for patient safety, and that all staff are identifiable and accountable, and errors in patient identity, site and type of procedure are avoided completely. By following a few critical steps, health care professionals can minimize the most common and avoidable risks endangering the lives and well-being of surgical patients.

Before induction of anaesthesia, Sign in

Before the patient undergoes anaesthesia, the patient must confirm his/her identity, the site of operation, what procedure is to be carried out and that he/she has consented for the procedure. The site of operation must be marked if applicable. Then the presence or absence of allergies must be checked, the amount of expected blood loss discussed, and an anaesthetic safety check must be completed.

Time out

Before the surgical procedure begins (i.e. before the first incision), the entire team must take a 'time out' (stop and pause). At this stage, all people in the room must introduce themselves by name and role. The surgeon and anaesthetist must then confirm the name of the patient and the procedure taking place, and any anticipated critical events. These clinicians also discuss the need for antibiotics and imaging.

Sign out

Before the patient leaves the operating room there is a further check, usually conducted by the nursing staff. The instrument, sponge and needle counts are checked, equipment is checked and specimens are checked as appropriately labelled. The surgeon, anaesthetist and nursing staff then must discuss any key concerns for recovery management of the patient.

**BEFORE INDUCTION OF THE
ANAESTHESIA**

Sign in

**BEFORE GIVING INCISION INSIDE
THE OPERATION ROOM**

Time out

**BEFORE LEAVING THE OPERATING
ROOM**

Sign out

Surgical Safety Checklist



World Health
Organization

Patient Safety

A World Alliance for Safer Health Care

Before induction of anaesthesia

(with at least nurse and anaesthetist)

Has the patient confirmed his/her identity, site, procedure, and consent?

☐ Yes

Is the site marked?

☐ Yes

☐ Not applicable

Is the anaesthesia machine and medication check complete?

☐ Yes

Is the pulse oximeter on the patient and functioning?

☐ Yes

Does the patient have a:

Known allergy?

☐ No

☐ Yes

Difficult airway or aspiration risk?

☐ No

☐ Yes, and equipment/assistance available

Risk of >500ml blood loss (7ml/kg in children)?

☐ No

☐ Yes, and two IVs/central access and fluids planned

Before skin incision

(with nurse, anaesthetist and surgeon)

☐ Confirm all team members have introduced themselves by name and role.

☐ Confirm the patient's name, procedure, and where the incision will be made.

Has antibiotic prophylaxis been given within the last 60 minutes?

☐ Yes

☐ Not applicable

Anticipated Critical Events

To Surgeon:

☐ What are the critical or non-routine steps?

☐ How long will the case take?

☐ What is the anticipated blood loss?

To Anaesthetist:

☐ Are there any patient-specific concerns?

To Nursing Team:

☐ Has sterility (including indicator results) been confirmed?

☐ Are there equipment issues or any concerns?

Is essential imaging displayed?

☐ Yes

☐ Not applicable

Before patient leaves operating room

(with nurse, anaesthetist and surgeon)

Nurse Verbally Confirms:

☐ The name of the procedure

☐ Completion of instrument, sponge and needle counts

☐ Specimen labelling (read specimen labels aloud, including patient name)

☐ Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:

☐ What are the key concerns for recovery and management of this patient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

Revised 1 / 2009

© WHO, 2009

REVIEW OF LITERATURE

The 1999 (IOM) Institute of Medicine report, “To err is human” estimated that between 44,000 and 98,000 patients die each year as a result of medical errors in the United States . Other studies suggest that the incidence rate lies somewhere between 2.9 % and 16.6 %. Of concern is that nearly 45 % of adverse events (AE) occur in surgery, with a median of 43.5 % (interquartile range 39.4 to 49.6 %) of these considered as avoidable. The incidence of major complications as a result of surgery is estimated to be between 23.3 % and 77 % of inpatient surgical procedures. In an effort to reduce AE and complication rates in surgery, the World Health Organisation (WHO) launched the *Safe Surgery Saves Lives* campaign in 2008, advocating the use of checklists worldwide.

Since its introduction in over 122 countries, the WHO Surgical Safety Checklist (SSC) has been the focus of many published studies, including several meta-analyses, suggesting associated reductions in patient mortality and postoperative complication rates when the SSC is used. The SSC is intended as an ‘aid memoir’ for including key information or actions that may otherwise be overlooked or forgotten, thus ensuring timely and consistent communication among surgical team members. The 14 item checklist has three time points that reflect the take-off, cruise and landing phases of the aviation industry. Before anaesthesia induction *sign in*, the surgical team confirms patient identity, surgical site, anaesthetic concerns and estimated blood loss. Prior to skin incision, the entire team performs *time out*, a surgical ‘pause’ where anticipated critical events are reviewed, sterility and antibiotic status is confirmed, and imaging is verified and displayed. Before the patient leaves the operating room (OR), the *sign out* phase includes confirmation of the surgical count, procedure name, handling of tissue specimens, and ensuring equipment issues are addressed.

Despite the benefits associated with the SSC, recent research suggests universal implementation and continued use in the clinical environment is often inconsistent, and very much driven by the context. Enablers to SSC use include physician engagement and

leadership, tailoring and customizing the checklist to the local context, and creating opportunities for stakeholder reflection on checklist implementation and modification, giving them greater ownership of the process. Common identified barriers to sustained use of checklists in surgery include haphazard introduction, perceived duplication or redundancy of information, professional identification and team culture. The barriers and enablers to implementation identified across these studies predominantly encompass organizational and individual factors.

However, findings from previous studies in this suggest that checklist implementation does not always equate to compliance. In fact, two studies found that despite 100 % documented completion of the *sign in* phase of the checklist, most of the individual items were either not addressed as intended, or not addressed at all. Variation in compliance rates across studies has been noted in many of the prospective studies conducted in this area. Failure to consistently review all checklist items may increase patients' risk of preventable 'never events' such as wrong site/side surgery or retained foreign bodies. Consequently, identifying issues that act as barriers and enablers to checklist implementation may inform the development of knowledge translation strategies designed to increase item usage and overall uptake.

The literature shows that the implementation of such protocols has improved patient safety. In general, these efforts are viewed favourably by operating room personnel. However the role of these checklists in reducing wrong-sided surgeries has not been proven. The goal of the healthcare professional should be to continue to improve on the advances that have been made in implementing surgical checklists and preventing wrong site surgery. Although some studies report a general trend toward improved implementation after initiation of a surgical checklist, compliance reported in other studies varied considerably. Furthermore, additional measures such as periodic audits or monitoring, were necessary to maintain compliance. Kearns et al evaluated staff compliance after implementation of the WHO Surgical Safety Checklist. They found that compliance with Pre and Post Operative checklists was 61.2% and 67.6%, respectively, improving to 79.7% and 84.7% after 1 year. Helmio et al also studied hospital compliance 1 year after implementation of the WHO checklist. They found that the sign in portion of the checklist was completed in 62.3% of cases, the time out portion was completed in 61.1% of cases, and the sign out portion was completed in 53.6% cases.

.Although these studies looked at compliance over the course of a year,another area for future research is compliance over the course of a day.In the author's experience,the quality of the time out worsened over the course of a busy day in the operating room ,a phenomena known as "time-out fatigue".

No study that was reviewed reported a 100% compliance rate.Therefore there must be identifiable factors that influence compliance.Vats et al reviewed their experience in piloting the WHO surgical checklist and found many examples of improper use like non completion of the checklist,hurried completion of the checklists because of the pressure from the surgeons or anaesthesiologists,dismissive replies to checklists questions that typically went unchallenged,and completion of the checklist without key people being present.They identified 5 barriers and challenges to the implementation of the checklist 1)unfamiliarity with the checklist and embarrassment about its use 2)the hierarchial style in the operating room ,which was particularly an issue when the nurse in charge of running the checklist was timid or the surgeon or anaestheologist was unsupportive 3)problems with the timing of the time-out portion because certain processes such as identifying the patient was difficult to perform and the patient had been draped.4)Duplication or repetition of the items on the checklist which was sometimes considered "wasting time";and 5)inclusion of the items on the checklist that were not relevant to certain surgical specialities in an effort to make the list all inclusive.

The effect of surgical safety checklist on patient safety measures has been reported in the literature.A recent meta-analysis found that the use of WHO surgical safety checklist improves patient safety in the operating room by decreasing postoperative complications and mortality.The use of this checklist has also been shown

To improve processes such as timely use of prophylactic antibiotics .Perhaps one way that these checklists improve patient safety is through their effect on team communication.One goal of this checklist is to improve patient safety by increasing team communication.This is an important consideration because most clinical errors and instances of wrong site surgery result from a lack of communication among team members.The literature is consistent in reporting that ,after their implementation,surgical safety checklist help to improve team communication and decrease communication failures.Some studies give insight into the effect of these checklists on preventing wrong-site surgery.Panessar et al showed that the use of the surgical safety checklist could have prevented 28 of 133 wrong-site surgeries.Although

this finding gives support to the use of these checklists, it says little about whether surgical checklist prevent wrong site surgeries. According to Treadwell et al because wrong site surgery is rare showing a statistical reduction would require an unfeasibly large study. Despite initiatives by major health organizations to improve surgical safety there is still work to be done to ensure that events such as wrong site surgery no longer occur. Implementation of such protocols has improved patient safety and in general is viewed favourably by operating room personnel.

RATIONALE

This study is intended to find out the compliance of WHO's Surgical Safety Checklist in the West block operation theatre of Max Hospital, Saket. The West Block OT is situated on the first floor and is a mass OT having seven Operating rooms. All the major surgeries of neurology, nephrology, orthopaedics, gynaecology and gastrology are conducted in this OT. This study will help to analyse the safety measures taken during the surgical procedures, from the entry of the patient in to the pre-operative recovery area, safety measures taken around the operation table, before leaving the operating room and the patient in the post operative recovery area.

The aim of the study is not only to check the overall compliance of the checklist but also to analyze each and every element of the checklist and its effective usage in different surgical departments conducting surgeries in the West Block mass OT. The study will also help to understand the complete process flow of the patient inside the OT. This study is a platform to observe and analyze the challenges at each and every level of the process.

OBJECTIVES

- ❖ To check the compliance of the WHO Surgical Safety Checklist in the West block OT, Max Hospital, Saket.
- ❖ To analyze the usage of each element of the Surgical Safety checklist.
- ❖ To examine its compliance in different surgical departments and in various surgeries happening in the West Block OT.
- ❖ To study the entire process flow of the patient inside the operation theatre.
- ❖ To search the areas of problem and find the reasons for the same.
- ❖ To give recommendations for further improvement in the surgical safety of the patient.

METHODOLOGY

- **Type of study** : Observational cross-sectional
- **Study population** : In Patients, surgeons, anaesthetists, nurses and OT staff from 16th April, 2016 to 16th May, 2016 at Max Super Speciality Hospital, West wing, Saket, Delhi
- **Study area** – Operation theatre complex, Max Hospital, West wing, Saket, Delhi
- **Duration of Study** – 1 Month
- **Type of Data** - Quantitative
- **Technique** – Direct observation of the patients, doctors, nurses and the OT staff.
- **Tool** – Checklist
- **Sample size** – **100 surgical** patients with surgeries under GA from 16th April 2016 to 16th May 2016.
- **Sampling technique**- non random sampling
- **Inclusion criteria**-
 - ❖ All Patients in the operation theatre undergoing surgeries under GA, anaesthetists, surgeons, nurses in the mass OT of Max Hospital, West wing, Saket from 16th April 2016 to 16th May 2016.
 - ❖ Standard checklist and protocols followed by the operating staff during each surgery.

- **Data collection** - Quantitative (1Month)
- **Data entry**- Manually
- **Data Analysis**- Using bar charts, pie charts,area charts

OBSERVATIONS AND FINDINGS

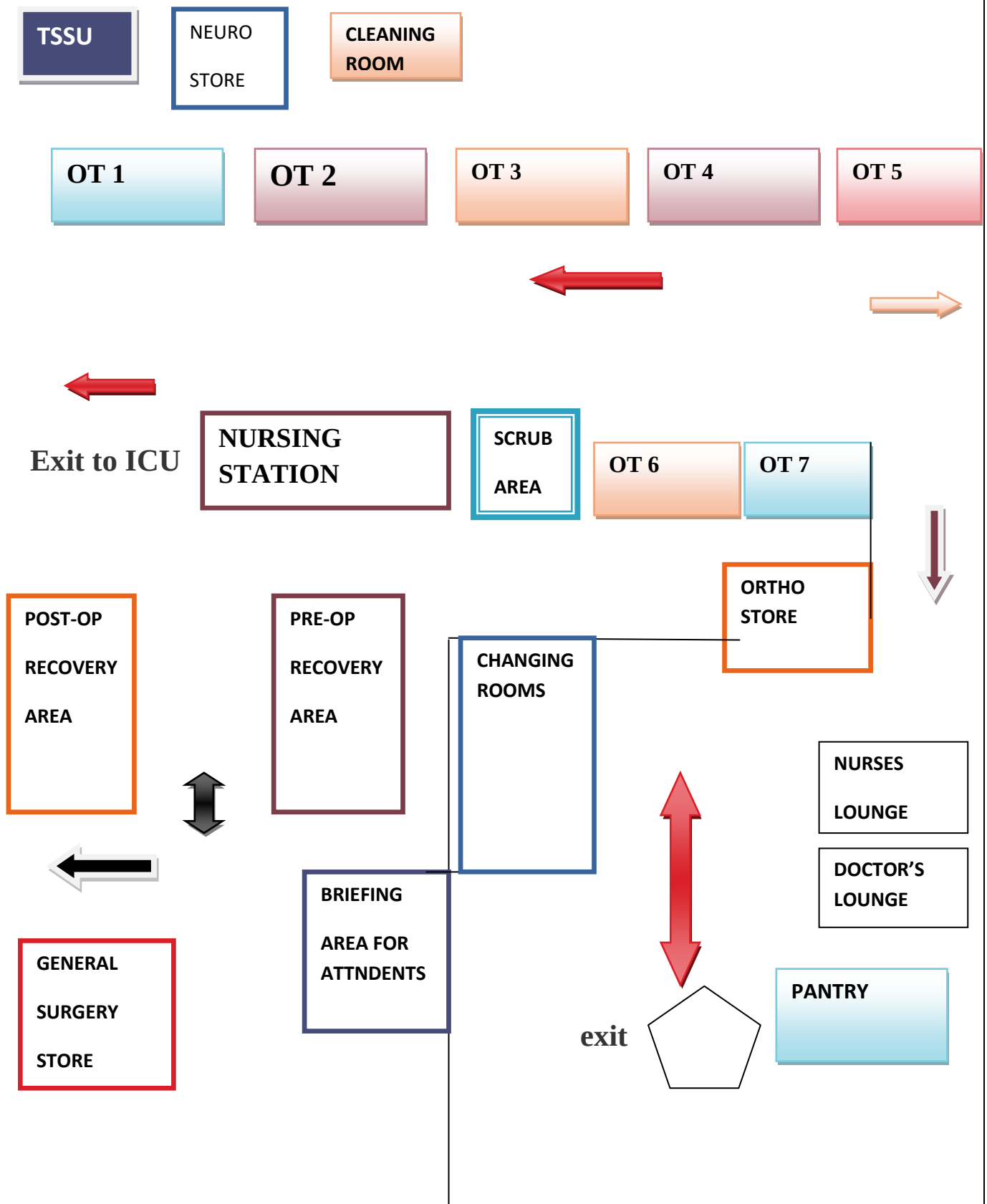
An introduction to the operation theatre complex under study

The west wing operation theatre is situated on the first floor at the west wing of the Max Hospital Saket.This OT complex consists of seven operating rooms.The surgeries commonly done in the complex includes neurosurgeries,nephro/uro surgeries,robotic surgeries,gyanaec surgeries, pediatric surgeries,general surgeries,orthopedic surgeries.

The OT complex runs 8.a.m to 8.p.m and is also available 24*7 for the emergency cases.**Dr Raj Tobin heads the operation theatre complex whereas Colonel Arti is the nursing head of the OT.Mr.Amar Singh Bhandari is the technical head.The OT staff includes the surgeons, anesthetists, DNB students of anesthesiology and the concerned surgical departments, nurses, technicians, TSSU staff, store managers, house keeping staff and the GDA.**

- Average number of cases done per day – 30 in each wing
 - 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).
 - Staffing ratio- Nurses : patients – 4:1(pre-op) ; 2:1(post-op)
Technicians: patients- 1:1
 - OT Utilisation – average is 70%
 - Max super speciality hospital recently got a GREEN OT certificate which signifies minimal amount of pollution caused by OT gases and acceptable standards of practices being followed here .
 - Sterilisation is done by ETO (12 hrs); autoclave. Fumigation is done twice a day in the morning and evening.
 - Bio medical waste disposal is done every 2 hours.
 - No. Of pre-op beds -3
 - No. of post-op beds -4
 - **Quality indicators: wrong patient , wrong surgeon , wrong surgery , return to OT(within 7 days) , waiting time for OT**
- **An internal audit is done twice every month by the quality team which includes the Medical Superintendent, Quality heads, Quality managers, Floor manager**

A Layout of the operation theatre under study



There are certain standards and protocols followed in the west wing operation theatre complex to maintain the quality standards and for the safe surgery of the patients as well as the safety of the operating staff.

Some of such protocols observed are:

Patient Identification: The circulating Staff Nurse always identifies the patient with the patient's chart and the operating schedule. In addition, the Staff Nurse verifies patient identification through verbal Communication with the patient.

Patient Observation:

Patients on stretchers or operating tables are never left unattended. Side rails and/or safety straps are utilized. Special care is ensured by provision of two or more personnel when moving patients to and from the operating table or when positioning patients on the operating table. When positioning patients, it is essential to provide supportive devices to protect nerves and blood vessels. Limbs are never to be hyper extended.

Dedication to Meticulous Aseptic

Max team members must be familiar with the infection control policies pertaining to the OR and apply the principles of aseptic and sterile technique at all times to avoid postoperative infection.

Execution of Accurate Counts:

The responsibility of accounting for all sponges, instruments, needles and sharps before the surgery begins and at the time of closure, rests with the circulating and scrub nurses. The circulating nurse must document on the operative record the outcome of all final counts. Patients are not to leave the operating room until final counts are correct or verification by x-ray determines that the missing item is not located in a patient cavity.

Use of Operating Equipment:

All equipment and appliances must be set up and used according to the recommendations and Instructions of the manufacturer. All new electrical equipment must be inspected prior to use and every six months thereafter by the biomedical engineer. Electrical equipment must be properly grounded to prevent electric shock and burns.

Prevention of Burns:

The scrub nurse shall immerse all hot instruments in a basin of cool sterile water, prior to handing them to the surgeon.

Proper placement of the electrosurgical ground pad is essential to prevent electrical burns. Cautery devices, when not in use, are to be secured in a holster. Coagulation/cutting settings on the electrosurgical units are set at the lowest setting and gradually increased.

- ☐ Flammable solutions (i.e., alcohol) are not to be utilized when electro surgery is in progress.
- ☐ All electrical equipment must be inspected prior to use.

Administration of Drugs:

- ☐ All drugs used by the surgeon are logged in the operative record. All drugs transferred to the sterile field are identified by the circulating nurse and the surgical technician.
- ☐ The scrub nurse repeats the name and dosage of the drug when transferring it to the surgeon.
- ☐ If more than one drug is present on the sterile field, each drug must be correctly identified.

Preparation of Specimens:

- ☐ All tissue removed from a patient is sent to Pathology and labeled with the site of the specimen.
- ☐ It is the responsibility of the surgical technician to communicate to the circulating nurse the origin of each specimen. It is the responsibility of the circulating nurse to label and record each specimen accurately.
- ☐ All specimens for frozen section are placed in a dry container and forwarded to the Pathology Laboratory.
- ☐ Note: Frozen section specimens are delivered to the Pathology Laboratory by (1) the surgeon or (2) a Special courier. The surgeon or courier signs the specimen log denoting transportation and delivery of the frozen section specimen.

Laser Surgery:

- ☐ All personnel participating in laser surgery must wear protective goggles.
- ☐ A sign indicating "Laser Surgery in Progress" is posted on the operating room door.
- ☐ All laser equipment is examined every six months by biomedical engineers.

Fire Safety:

Response of the Max team to a fire is outlined in the Fire/Emergency Preparedness Manual. Max Personnel participate in the fire drills as appropriate and review fire precautions in the annual recertification program.

Emergency Preparedness Responses:

Response of the Max team in a disaster situation is outlined in the Fire/Emergency Preparedness Manual. Max personnel participate in disaster drills and review emergency preparedness precautions in their annual re-certification program.

Radiation Safety (as Indicated by Procedure):

☐ X-ray badges are issued monthly to all scrub and circulating nurses and are to be worn at all times in

The operating suite. Badges are forwarded monthly to the radiation detection company.

Monthly Dosimetry reports are reviewed by Max's Chief Radiologist for current and cumulative dose per Employee. These reports are filed in the Max office.

☐ Radiation barrier gloves are available for use whenever there is a potential for radiation exposure to hands.

Equipment Maintenance:

All operating room equipment is inspected for operational integrity by Max personnel prior to each use and on a monthly basis. Equipment is to be removed from service immediately, if needed repair or a malfunction is evident. A repair tag is attached indicating the name of the department and the source of the malfunction.

Disposal of Waste:

All glass items are placed in containers which are marked "glass" (exception: infectious cases). All infectious (biohazardous) wastes, including glass, are single yellow-bagged, placed in the special collection container marked "Biohazardous Waste" and disposed of by Environmental Services personnel.

Disposal of Needles and Syringes:

Used needles and syringes are disposed of by placement in a rigid sharps disposal container which is present in each operating room. When container is 3/4 full it is capped and disposed of in the biohazardous waste collection container.

Use of Extension Cords:

☐ Under normal conditions, extension cords shall not be used. Temporary use of extension cords may be permitted under specified conditions and with proper approval.

☐ Power Failure: Extension cords may be used to connect items to limited charged power outlets.

☐ Only extension cords issued by the Engineering Department shall be utilized. Approval by the

Director of Engineering is required.

Use of Adapters:

Adaptor use within the facility is prohibited.

Anesthesia Safety:

Only nonflammable anesthetic agents are utilized in the operating rooms. Signs to this effect are posted outside each operating room. Conductivity of flooring is tested monthly, if there is no nonconductive flooring.

REQUIRED LIFE SUPPORT

EQUIPMENT_____

It is the responsibility of the anesthesia and/or Max Nursing staff to verify that all equipment is available and in good working order. All defective equipment will be removed from service and repaired.

The biomedical engineer is responsible for performing and documenting the preventive maintenance of all electrical equipment.

The following equipment will be maintained:

- ☐ Cardiac monitor with printer;
- ☐ Defibrillator and crash cart, including tracheostomy set, laryngoscopes and endotracheal tubes (**the crash cart is to be checked daily by the Staff Nurse on call for the day**);
- ☐ Oxygen analyzer for each anesthesia machine;
- ☐ Reserve oxygen and nitrogen tanks in operating room;
- ☐ Suction equipment in each operating room;
- ☐ Emergency call system
- ☐ Mechanical ventilation

LINE ISOLATION MONITORING

SYSTEM_____

This policy outlines the procedure for the line isolation system in Max OTs and is designed to provide

Optimal electrical safety for the patient and staff.

Procedure:

- ☐ the line isolation monitor is tested once a month by Engineering Department. The line isolation monitor will have a green signal lamp that remains lighted when the electrical system is adequately isolated from ground.

- ☐ When the continuity of the electrical system is not adequate, a red signal lamp and audible alarm will be activated.
- ☐ Electrical equipment will be unplugged, starting with the last item plugged in, until the alarm ceases and the green signal lamp is lighted.
- ☐ If possible, that piece of equipment shall not be used, until it has been repaired or replaced.
- ☐ At the end of the procedure, the operating room must not be used until the Engineering Department and the biomedical engineer have verified that the room is electrically safe.
- ☐ The line isolation system will be checked semiannually by the biomedical engineer or the Engineering Department for proper operation and the results documented appropriately.
- ☐ Anesthetized patients shall have their eyes covered with moist saline eye pads and taped shut during CO2 laser surgery.
- ☐ Conscious patients shall wear protective eyewear; discourage patient from moving during procedure.
- ☐ All doors shall be closed and all windows shall be covered, as appropriate.
- ☐ Areas that may come into accidental contact with the direct or reflected laser beam shall be protected by wet gauze, packing or drapes. Moist areas shall not be allowed to dry during the laser procedure. Keep saline or water and an irrigating syringe on sterile field.
- ☐ The surgeon shall be responsible for selecting laser wattage and power for each procedure.
- ☐ All injuries or hazardous incidents resulting from use of the laser, shall be reported immediately through the incident reporting system.
- ☐ To minimize the possibility of a fire, whenever the laser beam is in close proximity to the Endotracheal tube, anesthesia personnel shall appropriately protect the endotracheal tube from the laser beam. Only the surgeon shall have control of laser foot pedal.

Safety Measures Personnel:

- ☐ All personnel working with the laser shall attend an educational class, which includes, but is not limited to:
 - ☐ The responsibility for supervision of laser safety;
 - ☐ Policies and procedures for all personnel working with lasers;
 - ☐ Laser hazards and control measures;
 - ☐ Reporting and managing incidents;

Infection Control:

- ☐ The physician of any patient with a temperature of 100 degrees F will be notified and the patient will be further evaluated prior to surgery.

- ☐ Max infection control policies will be followed to help prevent the spread of nosocomial infections.
 - ☐ It is the responsibility of all healthcare personnel to follow good infection control procedures.
 - ☐ Good hand washing, before and after patient contact, with an antimicrobial soap will be done. No bar soap is to be used.
 - ☐ Stretchers will be cleaned with an approved germicidal agent between patient uses. Clean linen will be used for each patient.
 - ☐ Soiled linen is discarded into a plastic waterproof container with minimal handling.
 - ☐ Clean linen is stored in a clean, closed linen cabinet or a covered linen cart.
 - ☐ All areas that come into contact with patients are cleaned with an approved germicidal agent after use. This includes stretchers, chairs, bedside tables and patient clothing closets.
 - ☐ Visitors shall be kept to a minimum.
 - ☐ Physicians are requested to report any postoperative infections to the Infection Control Coordinator.
 - ☐ Gowns are considered sterile only from waist to shoulder level in front and the sleeves.
 - ☐ The edge of anything that encloses sterile contents is not considered sterile.
 - ☐ Sterile personnel must remain well within the sterile area. Nonsterile personnel must remain well away from the sterile areas.
 - ☐ Sterile personnel must keep contact with sterile areas to a minimum.
 - ☐ Moisture may cause contamination.
 - ☐ Pouring shall be done at the edge of the table, not at the middle.
 - ☐ When passing in a sterile field, sterile personnel pass back to back or front to front.
- Remember sterile to sterile.
- ☐ Gloved hands must be kept at waist level or above. Below the waist is contaminated. Keep away from mask. Arms are not to be folded under axillae.
 - ☐ Always keep gloved hands in sight.
 - ☐ Once in position, drapes are never moved or shifted.
 - ☐ The nurse will hold the paper tab while the physician pivots to the left.
 - ☐ The physician then pulls the string to release it from the paper tab and ties the waist string.
 - ☐ The scrub nurse will give each member of the scrub team a sterile moistened towel to remove powder residue from their hands prior to beginning the surgical procedure.
 - ☐ Note: All Ambulatory Care Services nursing personnel must be capable of gowning and gloving

members of the surgical team.

- ☐ All personnel entering semi-restricted and restricted areas of the surgical suite shall be in Operating room attire.
- ☐ Operating room attire consists of standard multi-use fabric or limited-use nonwoven pant suits and a low-lint surgical hat or hood. OR attire which is soiled or wet shall be changed. All reusable attire shall be laundered after each use, by a laundry facility approved and monitored by Max. OR attire shall be stored in an enclosed cupboard.
- ☐ a cover gown is to be worn whenever leaving the surgical suite and either shoe covers should be Worn or a change of shoes.
- ☐ All head and facial hair is to be covered while in the restricted areas of the surgical suite.
- ☐ The surgical hat or hood is to be clean, free of lint and confine the hair. The surgical hat or hood is changed daily. Reusable hats or hoods shall be laundered after each use, by the laundry facility approved and monitored by Max.
- ☐ All personnel entering the restricted area of the surgical suite, are to wear closed-toe and Heeled nonfabric shoes. Clogs or fabric-constructed shoes are prohibited.
- ☐ Shoe covers shall be worn if it is anticipated that splashes or spills will occur.
- ☐ when shoe covers are worn, they are to be changed whenever torn, soiled or wet. Shoe covers are to be removed whenever leaving the surgical suite.
- ☐ All Ambulatory Care Services personnel shall wear a high filtration mask in the surgical suites.
- ☐ Masks shall be worn at all times in the surgical suites and other areas where open sterile supplies or scrubbed personnel are located. Masks shall cover the nose and mouth and shall be discarded whenever removed. Personal jewelry worn in the surgical suites shall be limited to the following:
 - ☐ Watch

DATA ANALYSIS

Figure 1

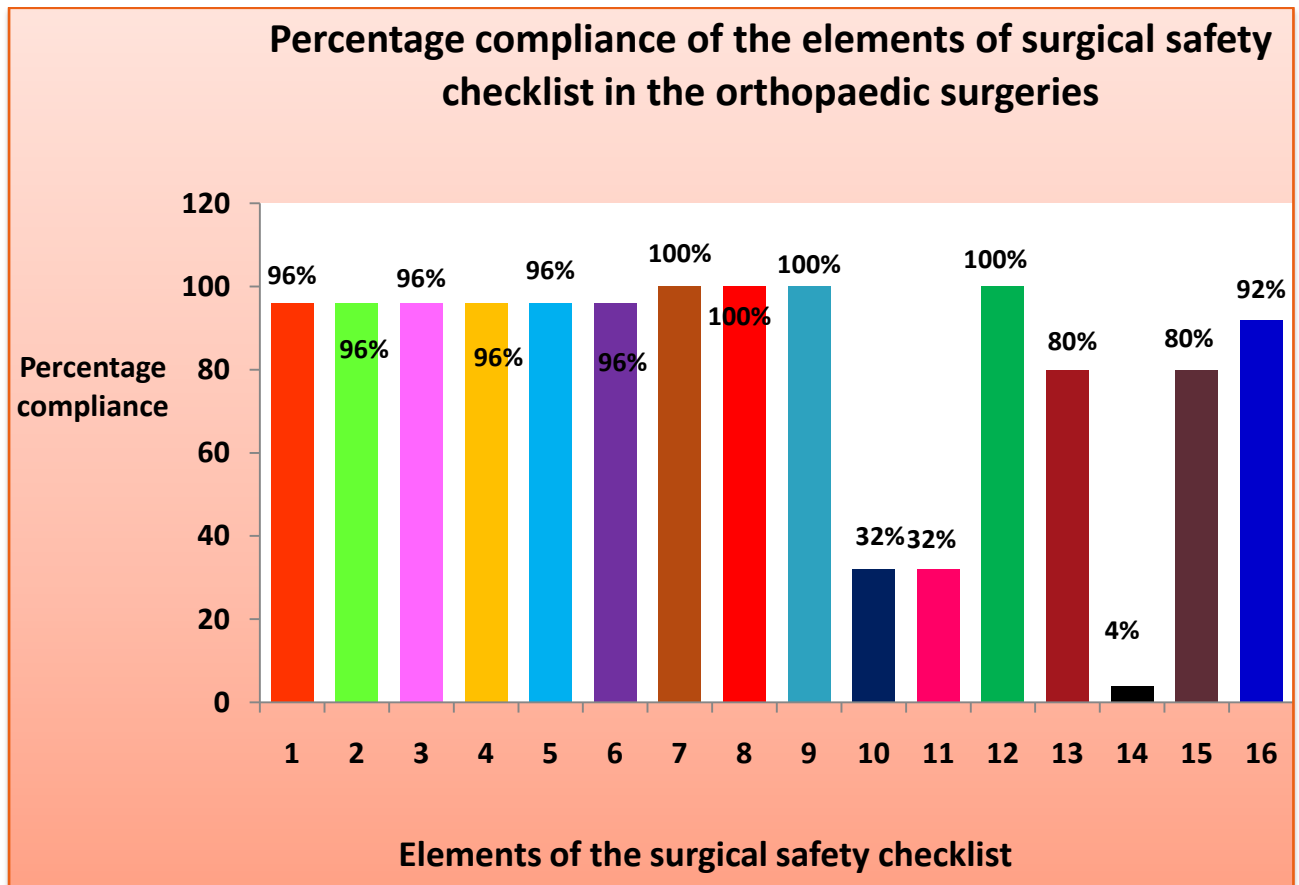


Figure 1

INTERPRETATION:

On observing the cases of orthopaedic surgery it was seen that few elements were having 100% compliance such as patient allergic history information taking, anaesthetists confirming the status of blood loss in the patient, nurse verbally confirming the name of the procedure during the sign out.

Figure 2

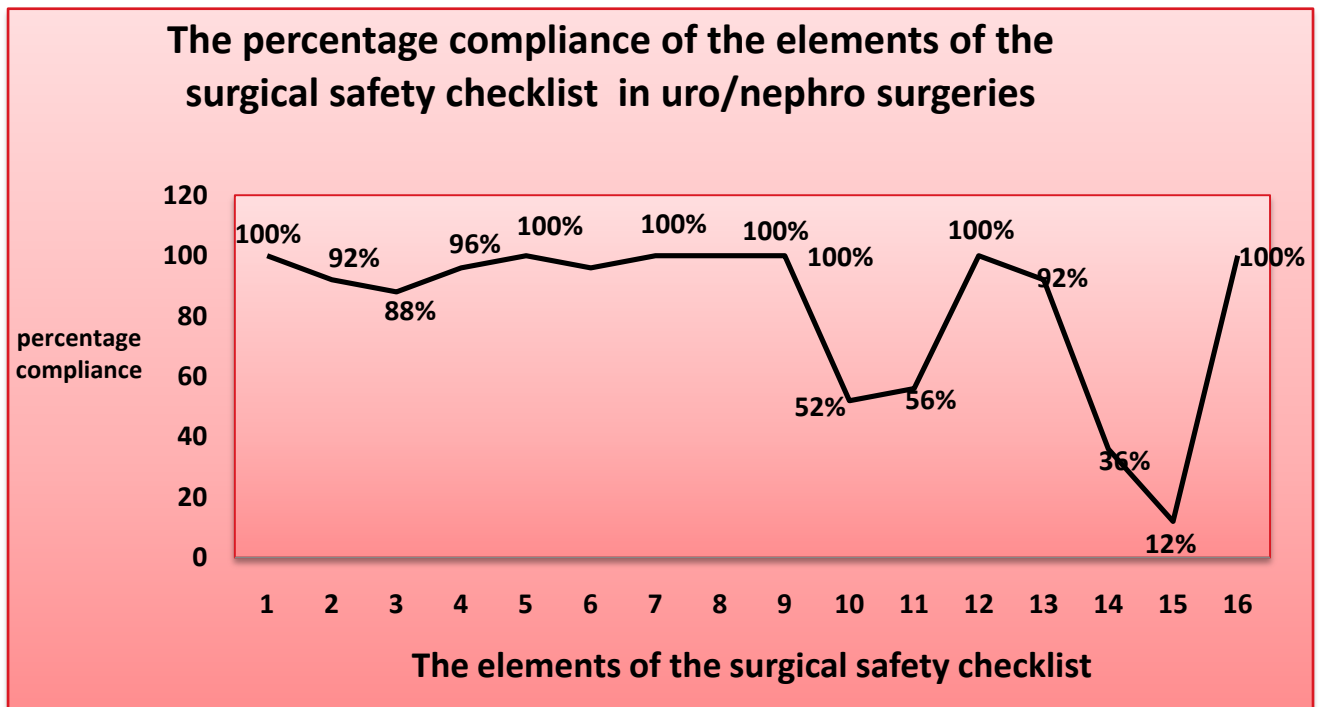
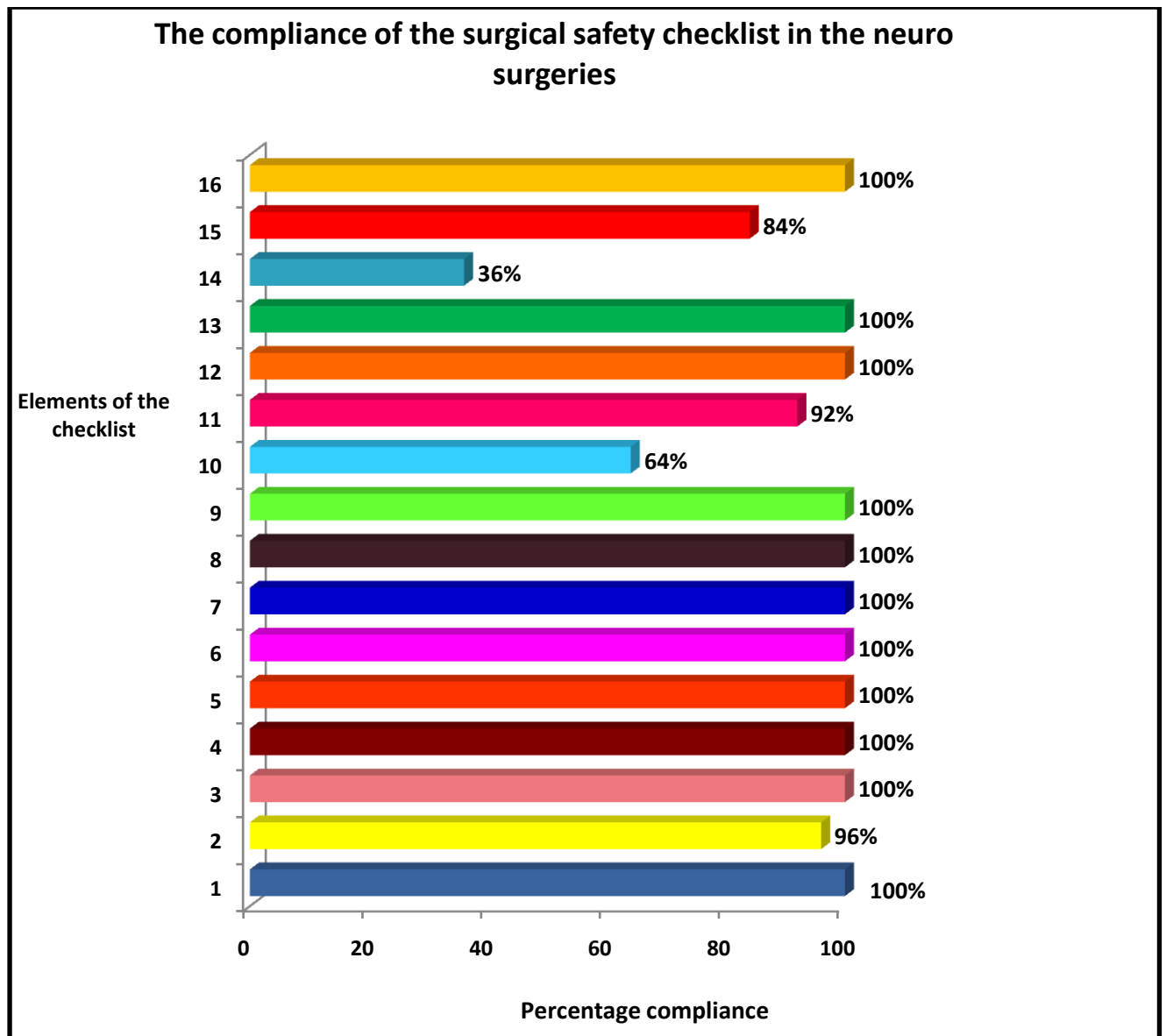


Figure 2

INTERPRETATION

There was 100% compliance in identification, site marking, risk checking of the blood loss, introduction of the team during the time out, confirmation of the patient's name, procedure and incision area, display of the essential imaging and documentation of time. There was 12% compliance seen with the documentation of the signature, name of the surgeon and the nurse. The effective communication of the key concerns during the sign out was found 36%.

FIGURE 2

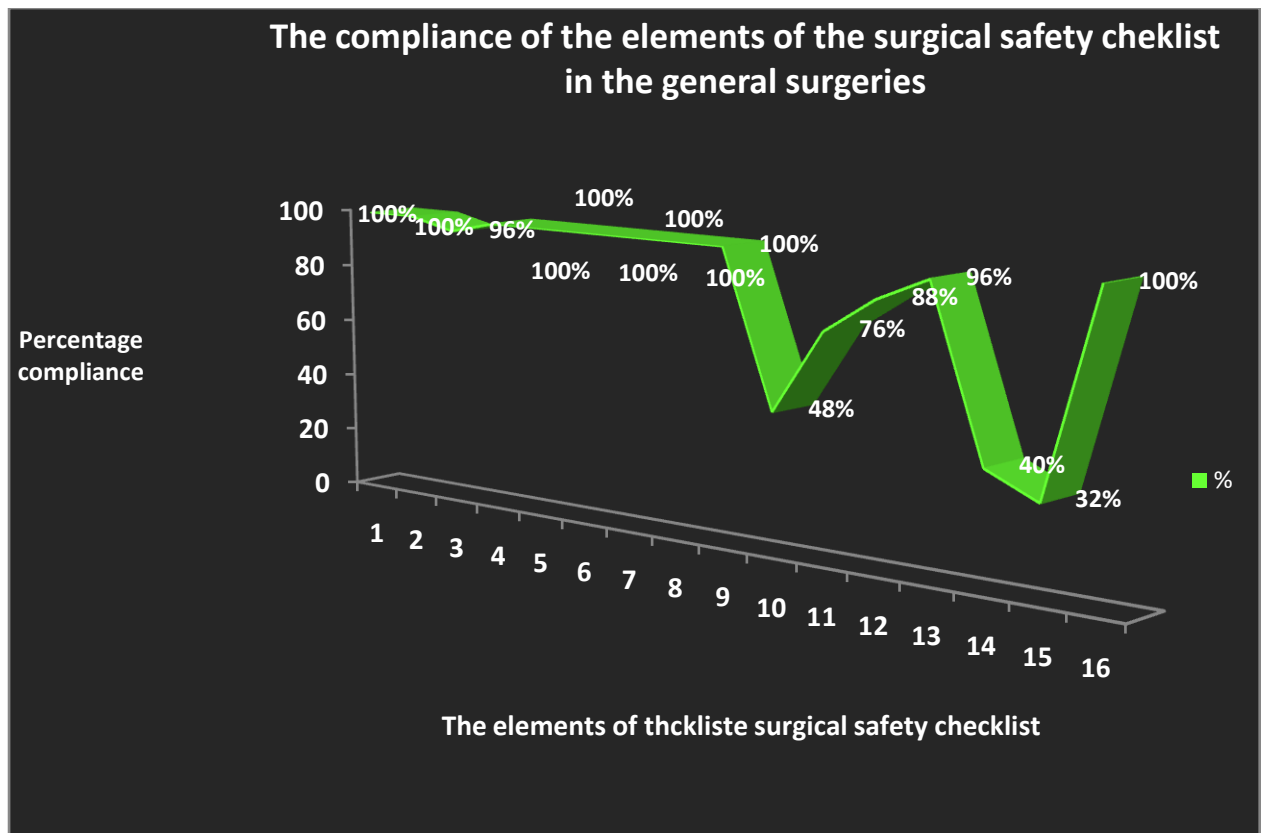


INTERPRETATION

On observing the data it is seen that 11 elements out of the 16 are effectively followed and have 100% compliance.

The antibiotic prophylaxis during the time out was found 64% compliant.

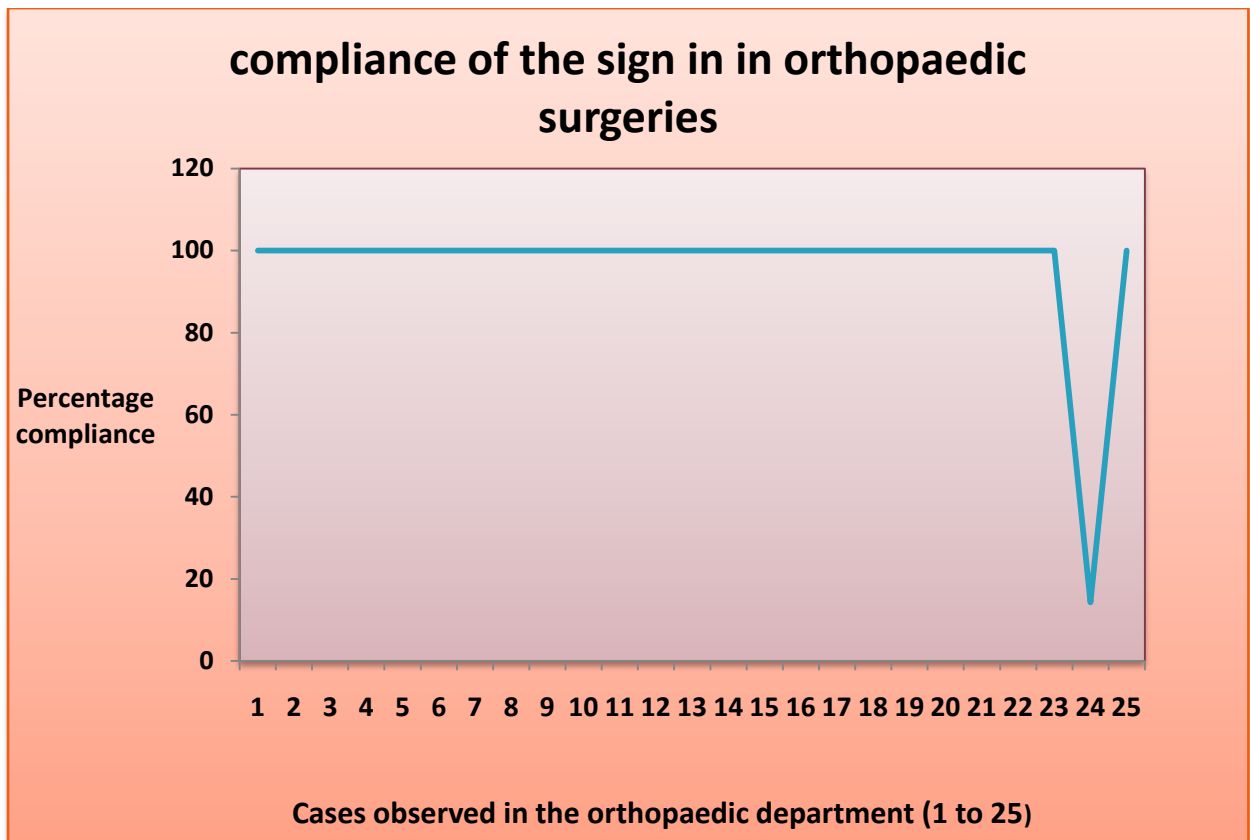
Figure 3



INTERPRETATION

It is seen that 9 out of the 16 elements of the surgical safety checklist shows 100% compliance. The least compliance is shown by the element number 15 which denotes the documentation part of the checklist and it is recorded as 32%.

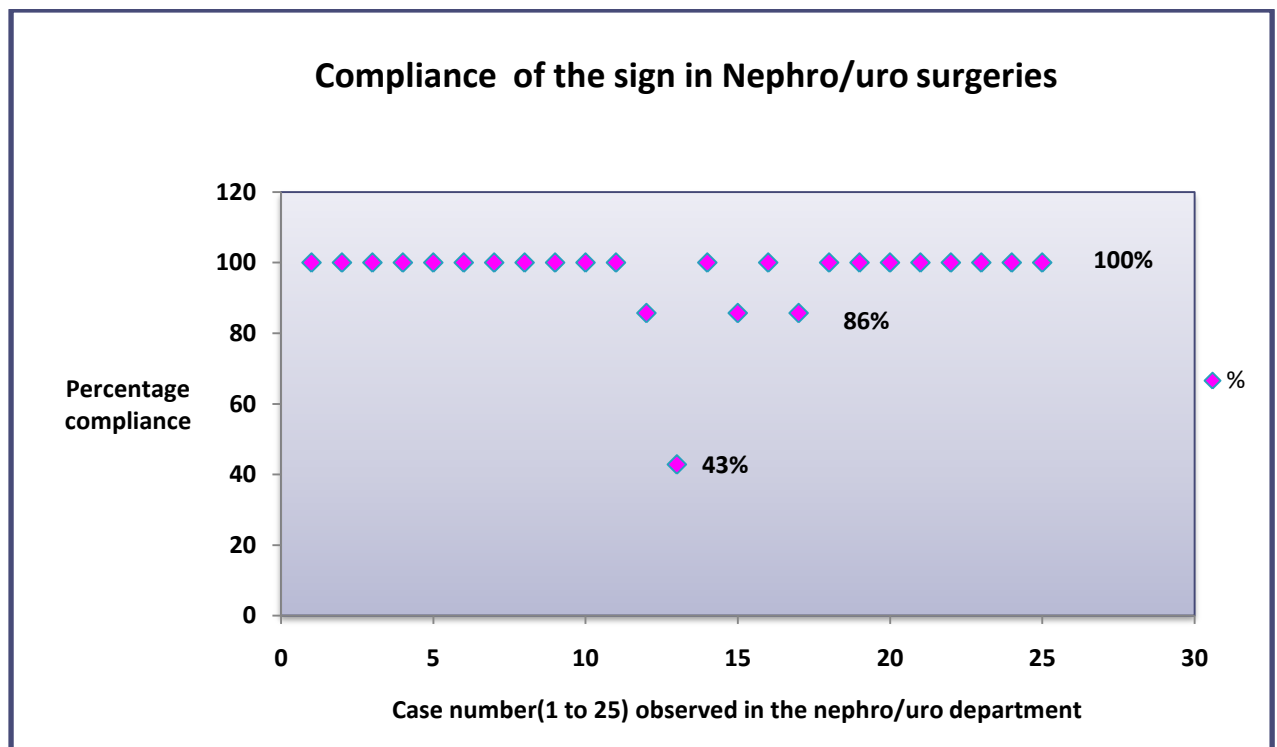
Figure 5



INTERPRETATION

It is seen that the compliance of the sign out in the orthopadeic surgeries is very high .All 24 cases out of the 25 cases showed 100% compliance.

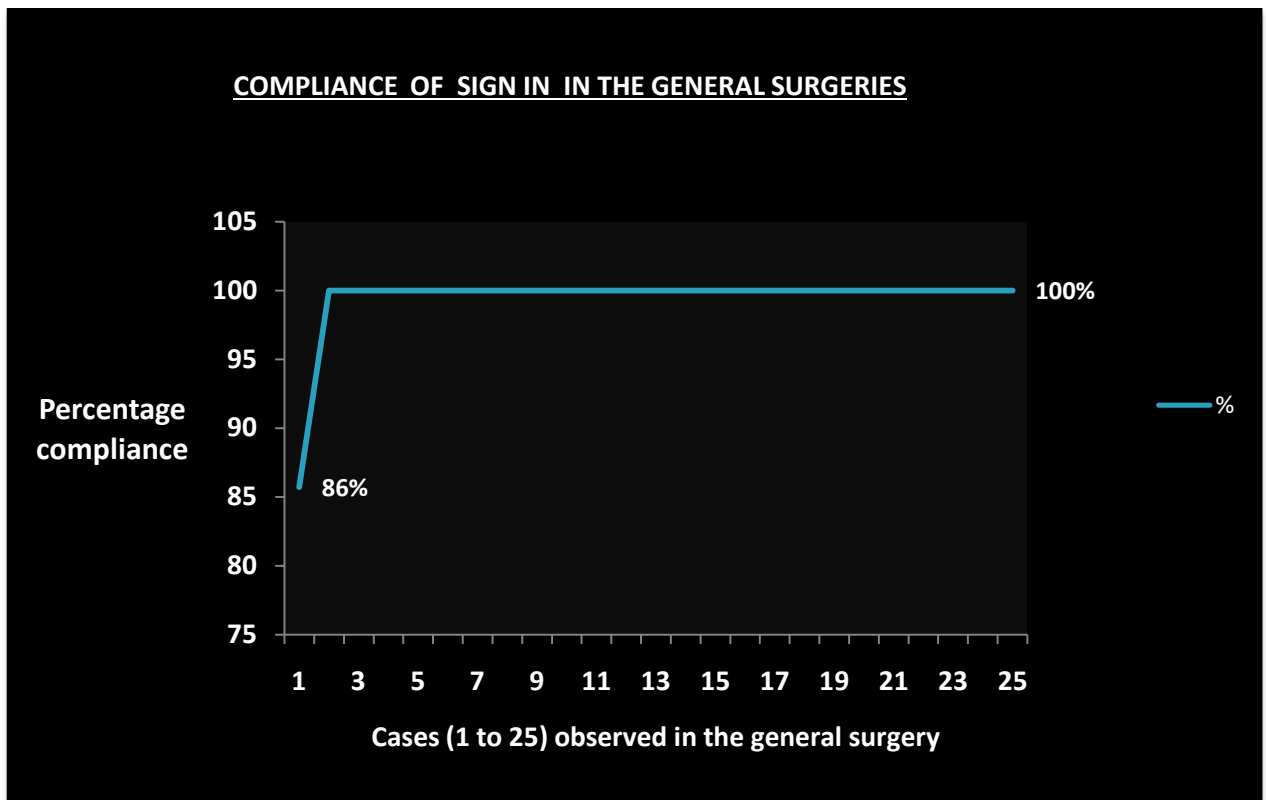
Figure 6



INTERPRETATION

Out of the 25 cases, there were 21 cases which showed 100% compliance with the sign in.

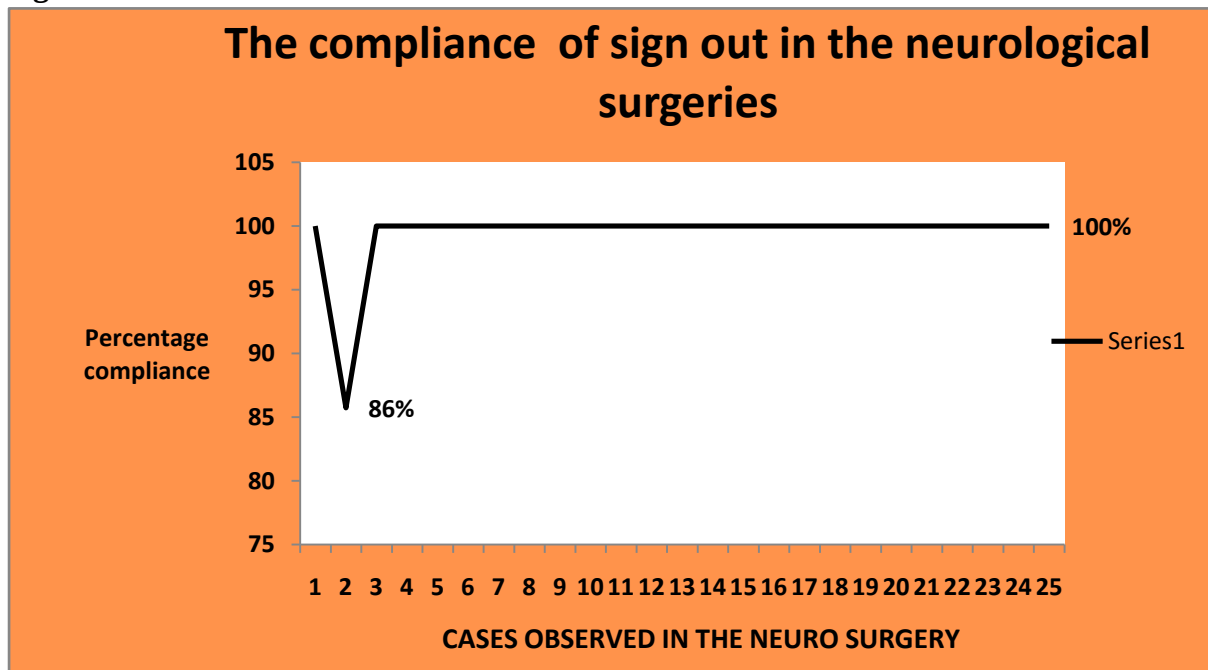
Figure 7



INTERPRETATION

The compliance of the sign in was found 100% in 24 cases and 86% in one case.

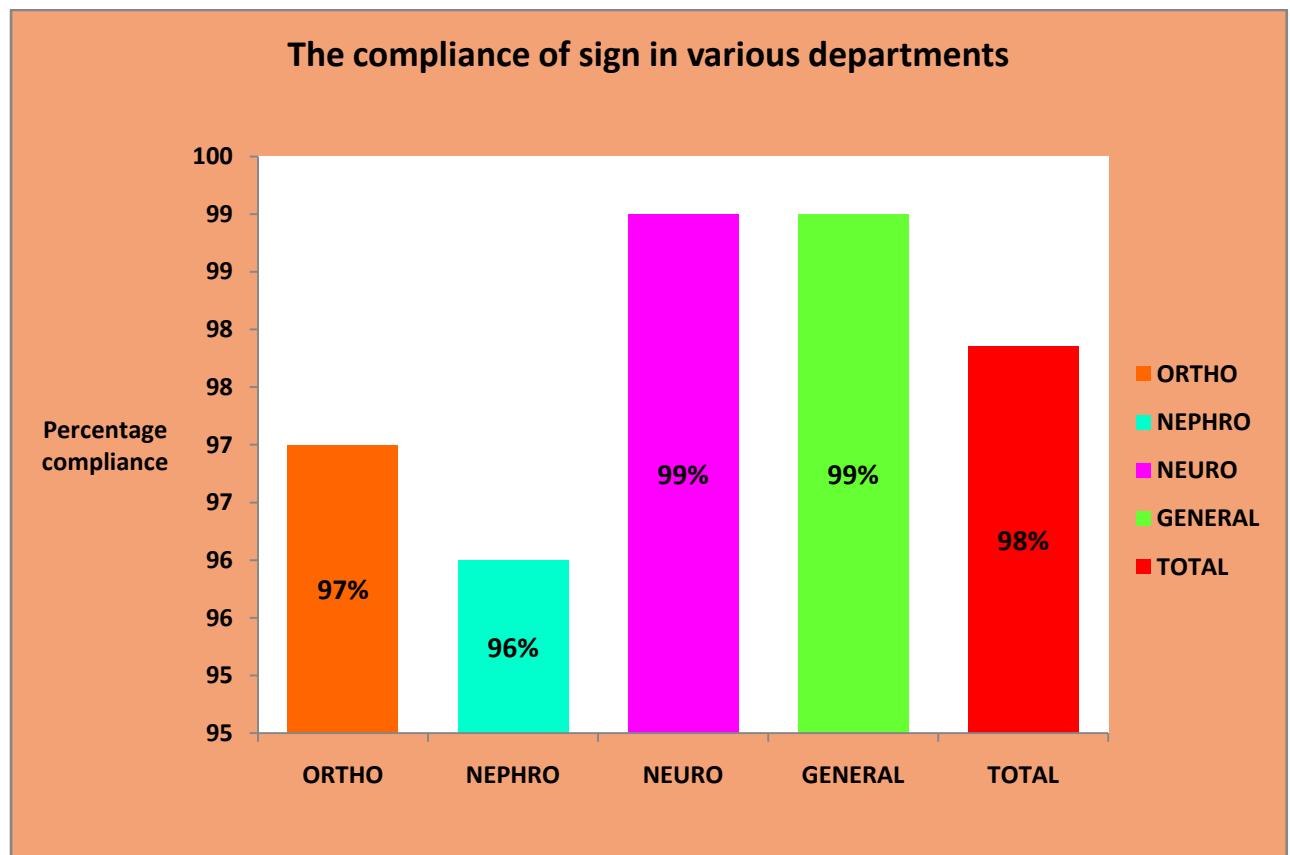
Figure 8



INTERPRETATION

The neurosurgeries showed 100% compliance in 24 cases and 86% compliance in one case.

Figure 9

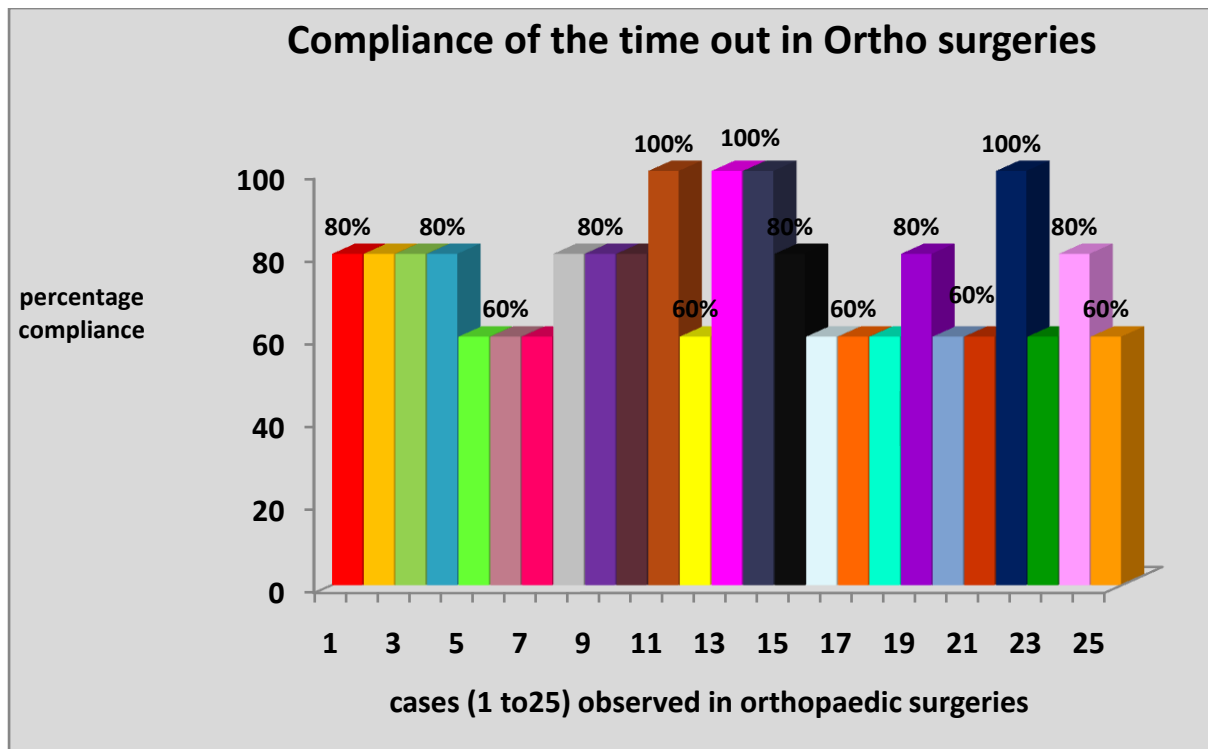


INTERPRETATION

On analyzing the data it is seen that the overall compliance of the sign in the west block OT of the Max hospital Saket is 98%.

Minimum compliance in sign in was seen as 96% which is again good and satisfactory

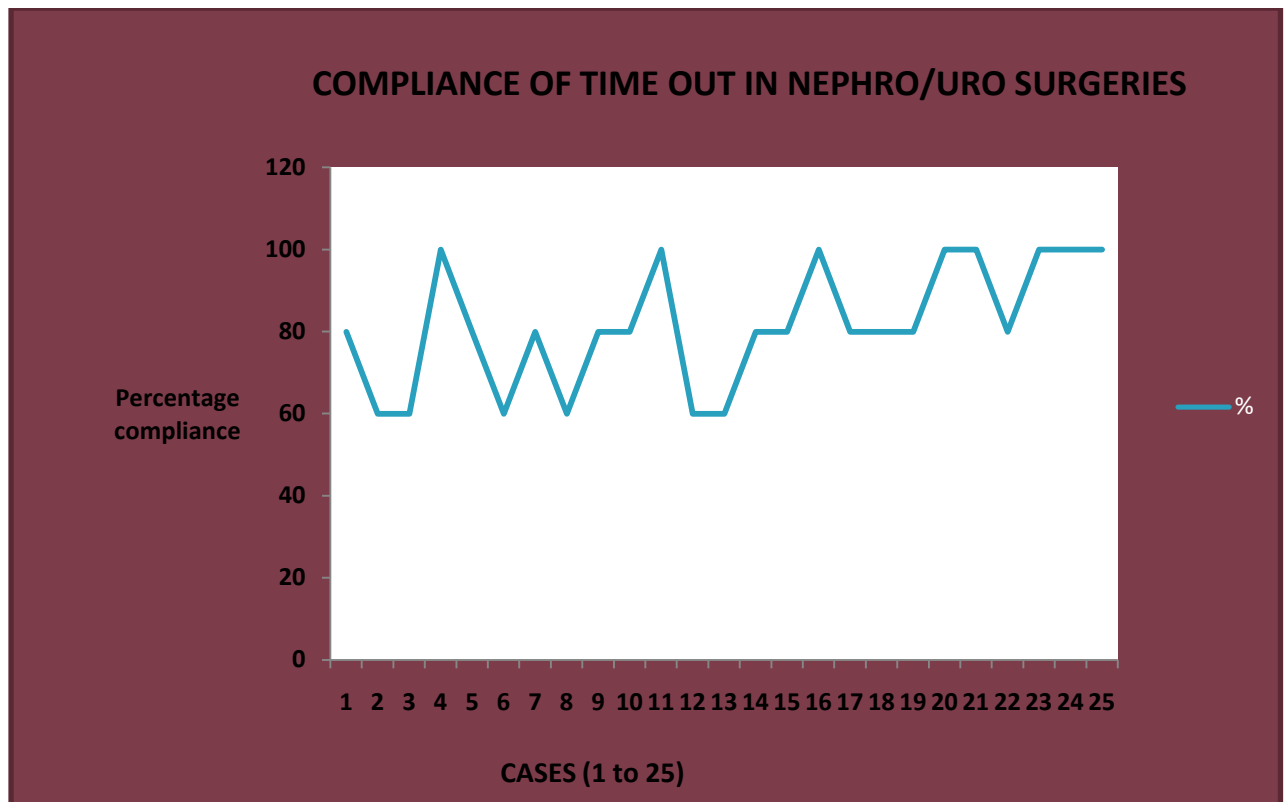
Figure 10



INTERPRETATION

There is 100 % compliance in 4 cases out of the 25, 60% in 11 cases, and 80% in the other remaining cases out of 25

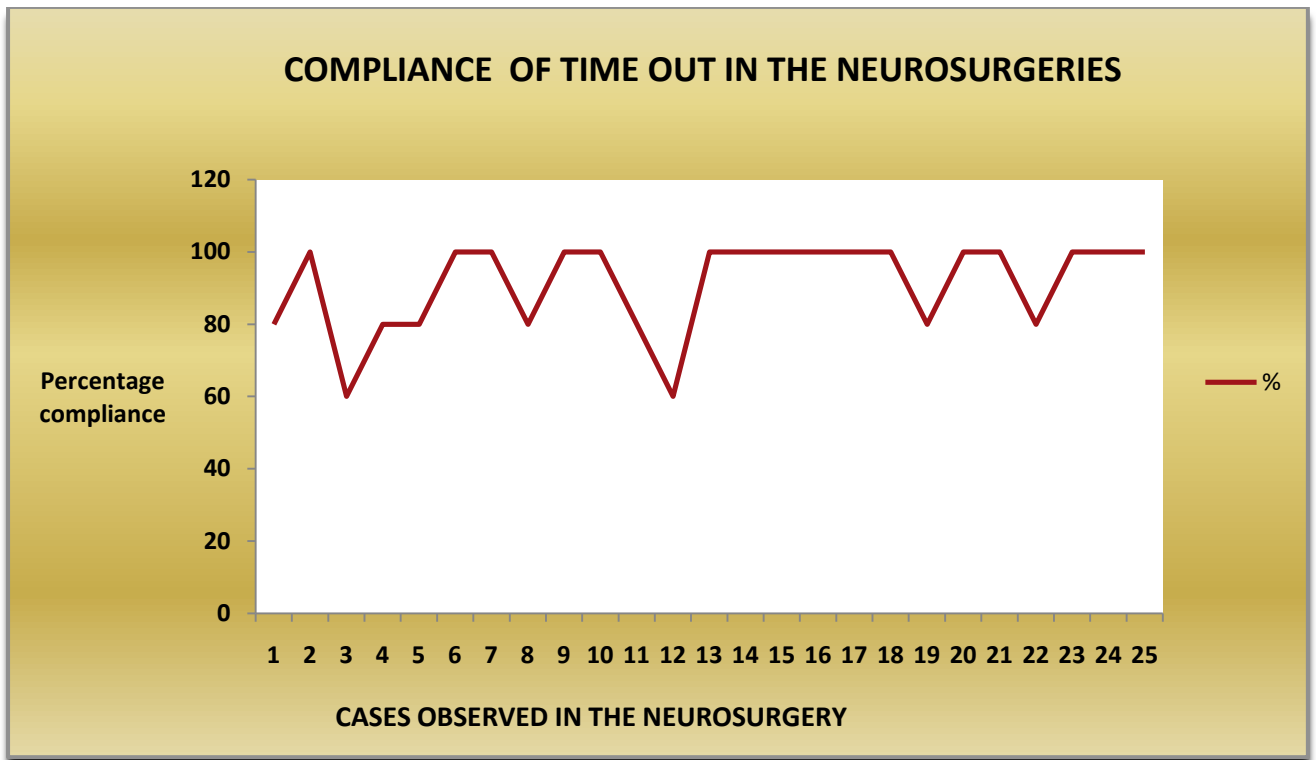
Figure 11



INTERPRETATION

Out of 35 cases 21 showed 100% compliance with the time out. There were 3 cases which showed 86% compliance and one case less than 50%

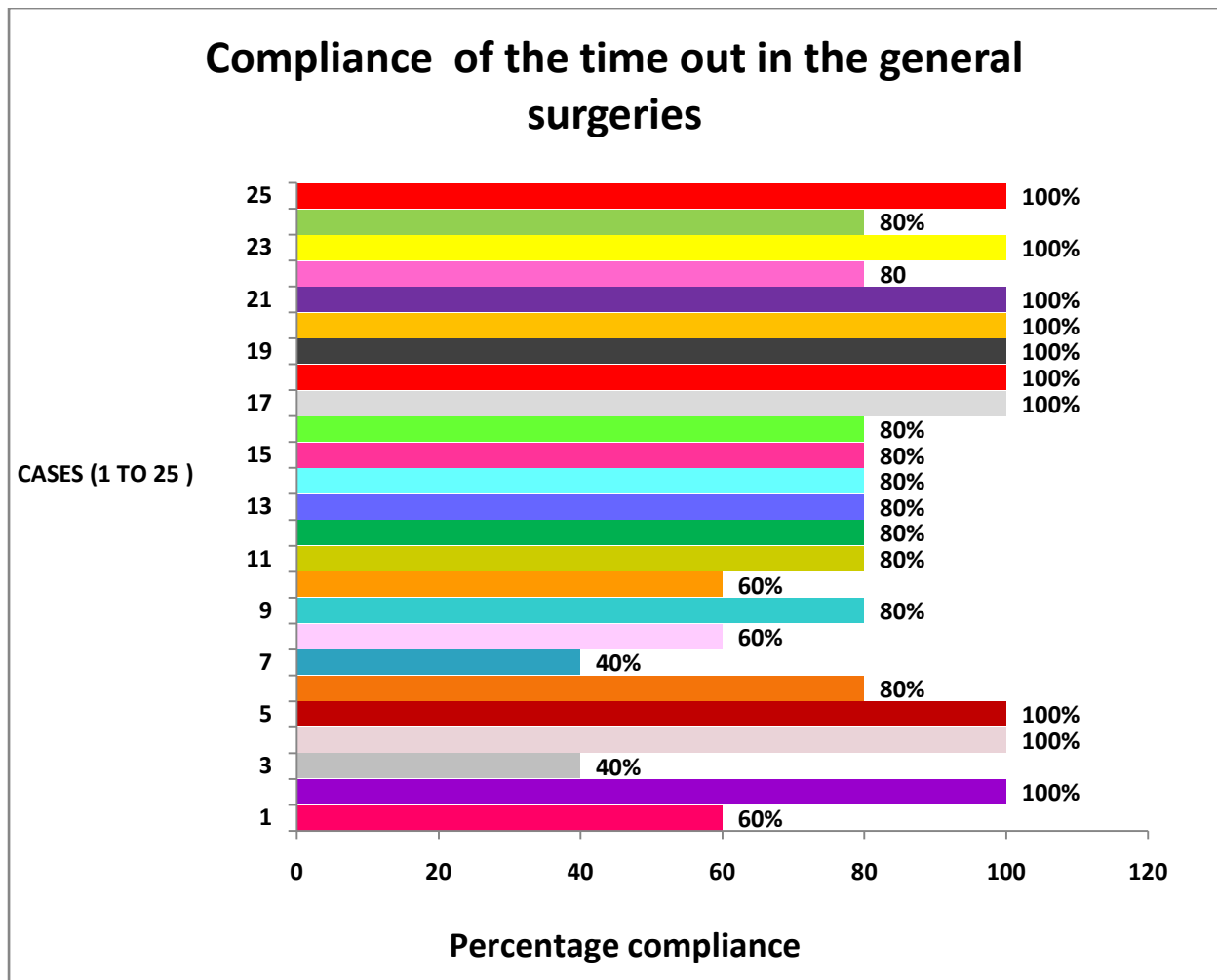
Figure 12



INTERPRETATION

In 14 out of 25 cases there was 100% compliance during the time out. There was 80% reported in 7 cases and remaining were 60% compliant.

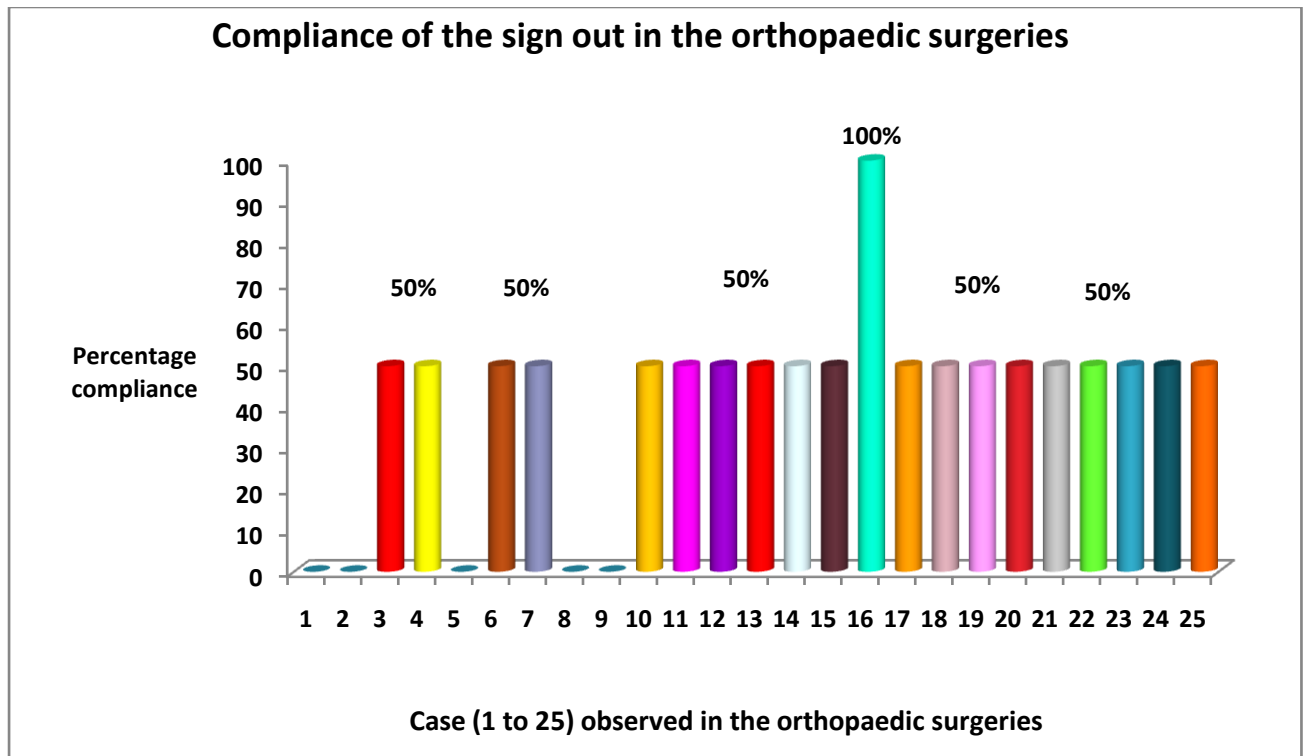
Figure 13



INTERPRETATION

There was 100% compliance with 10 cases out of 25, 80% in more than 10 cases and 60% in the remaining four.

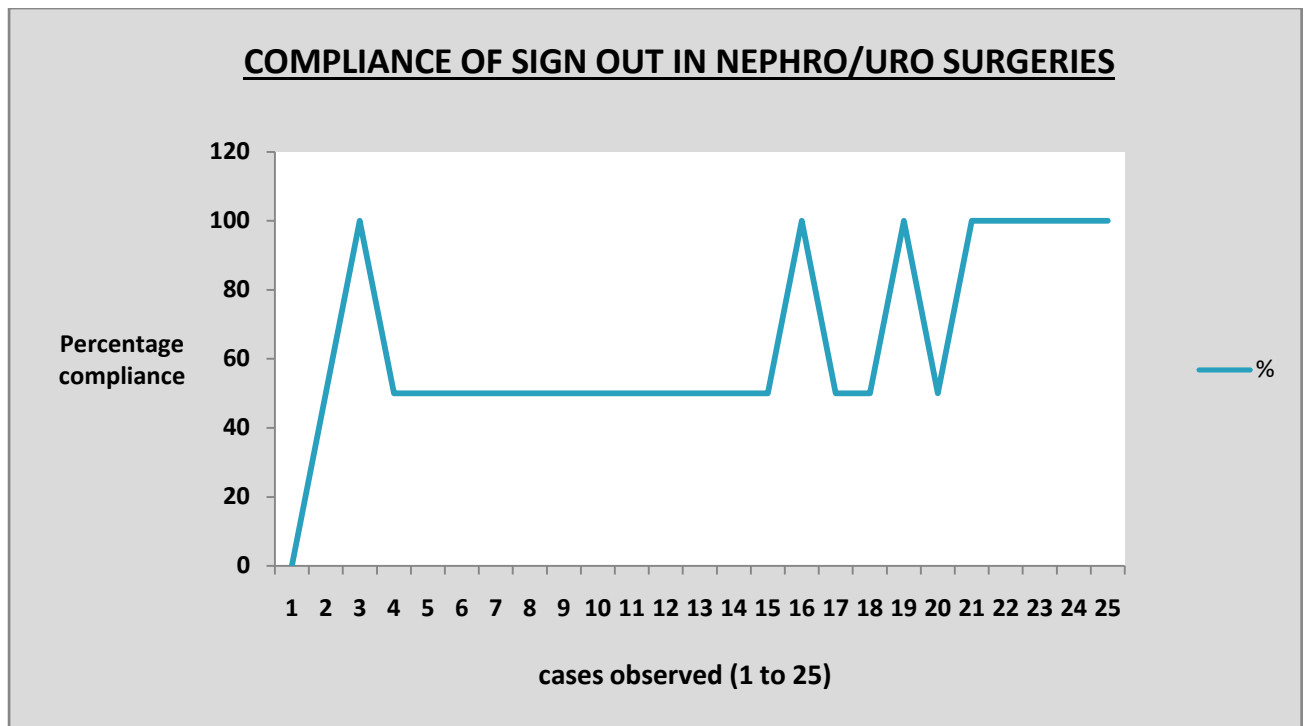
Figure 14



INTERPRETATION

It is seen that one case is 100% compliant and all others are 50%.

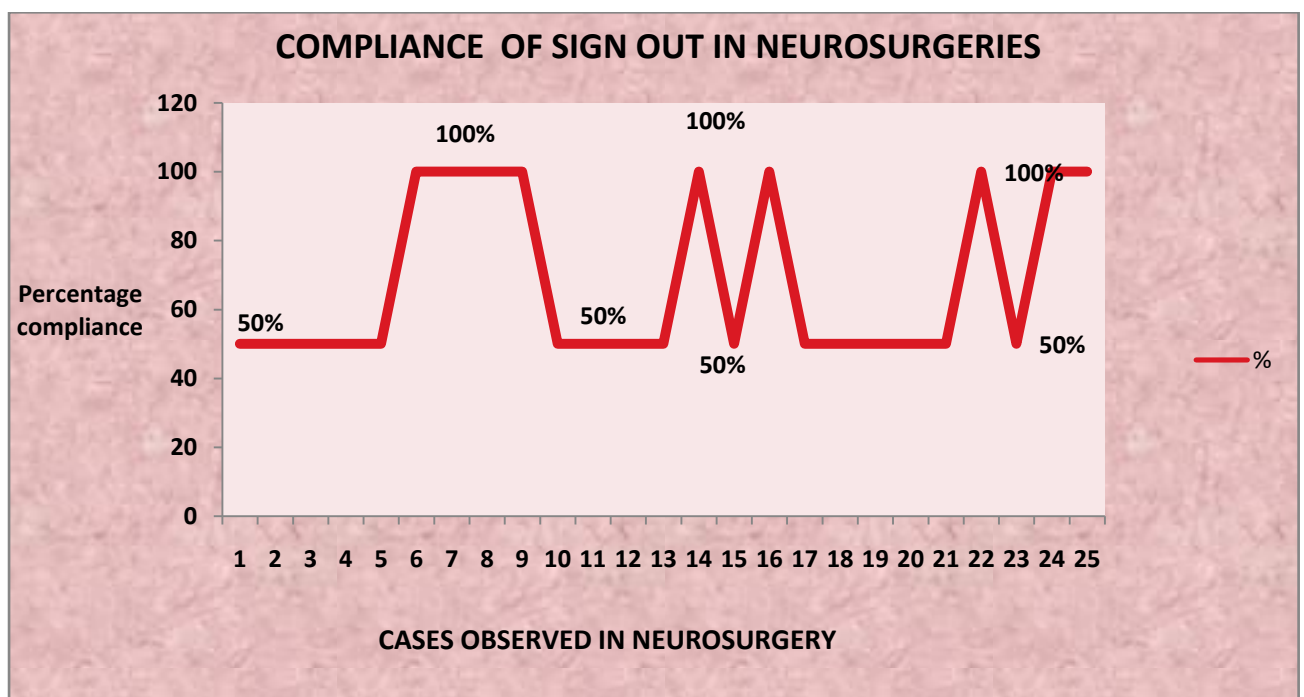
Figure 15



INTERPRETATION

The observation shows 8 cases as 100% compliant during the sign out. There were 16 cases found 50% compliant.

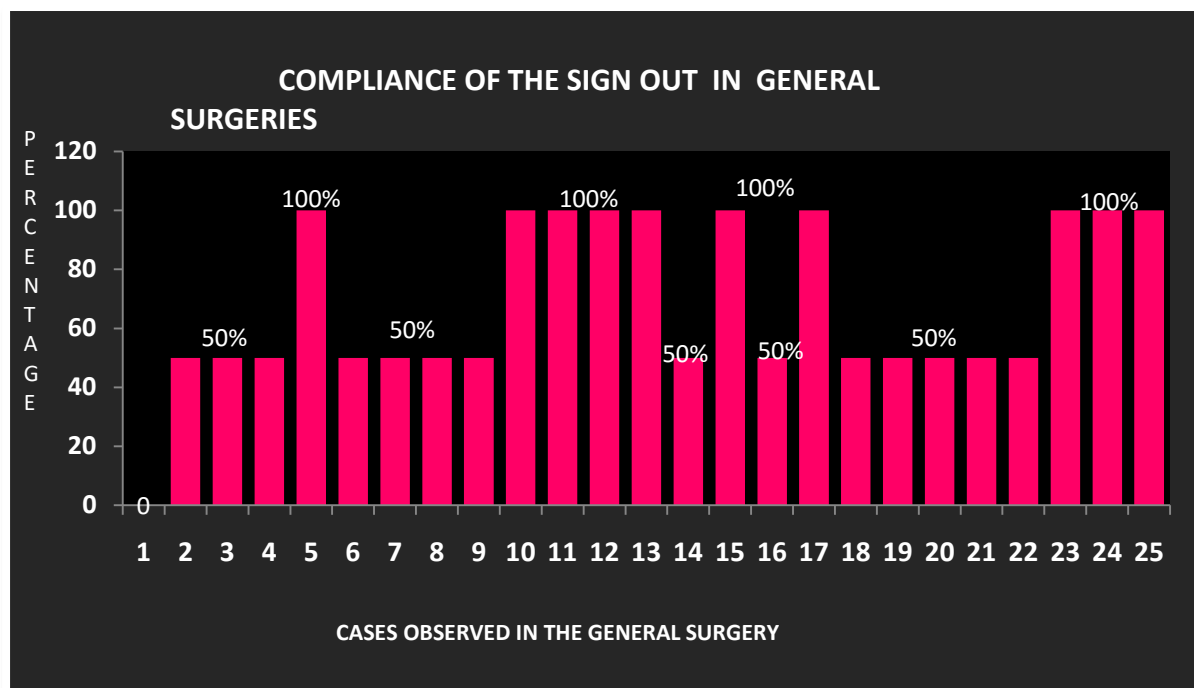
FIGURE 16



INTERPRETATION

The 9 cases have shown 100% compliance and the remaining are 50% compliant.

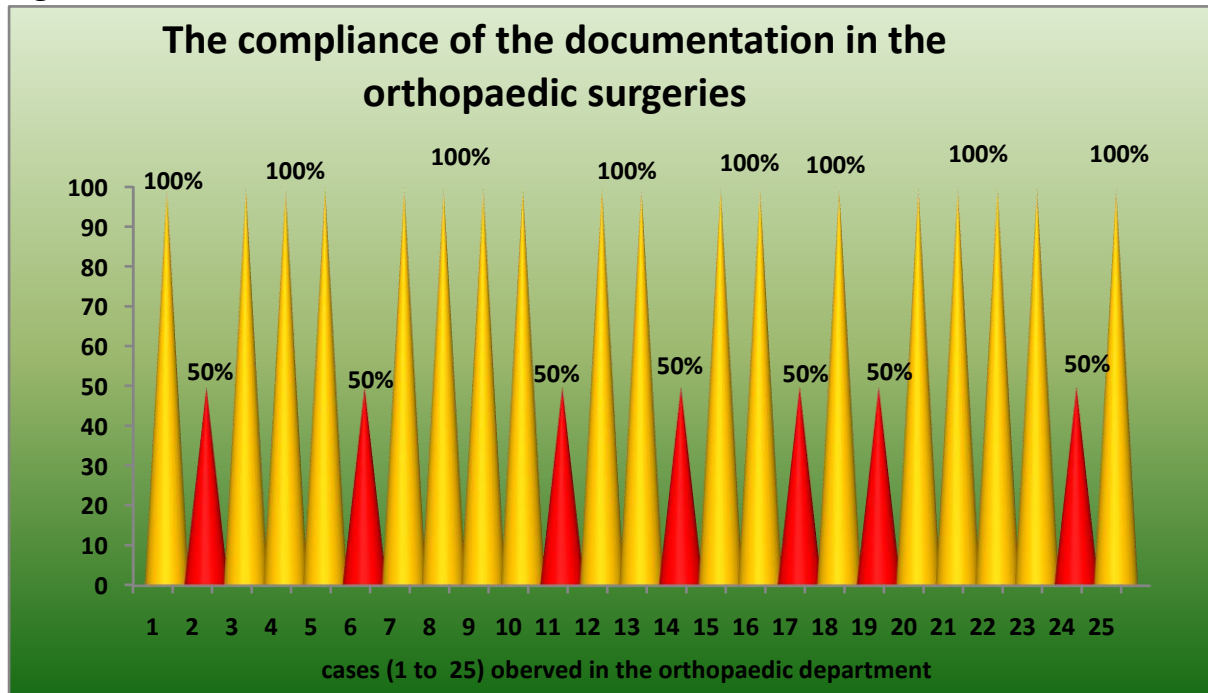
Figure 17



INTERPRETATION

It is seen that 10 cases are 100% compliant whereas the remaining are 50%

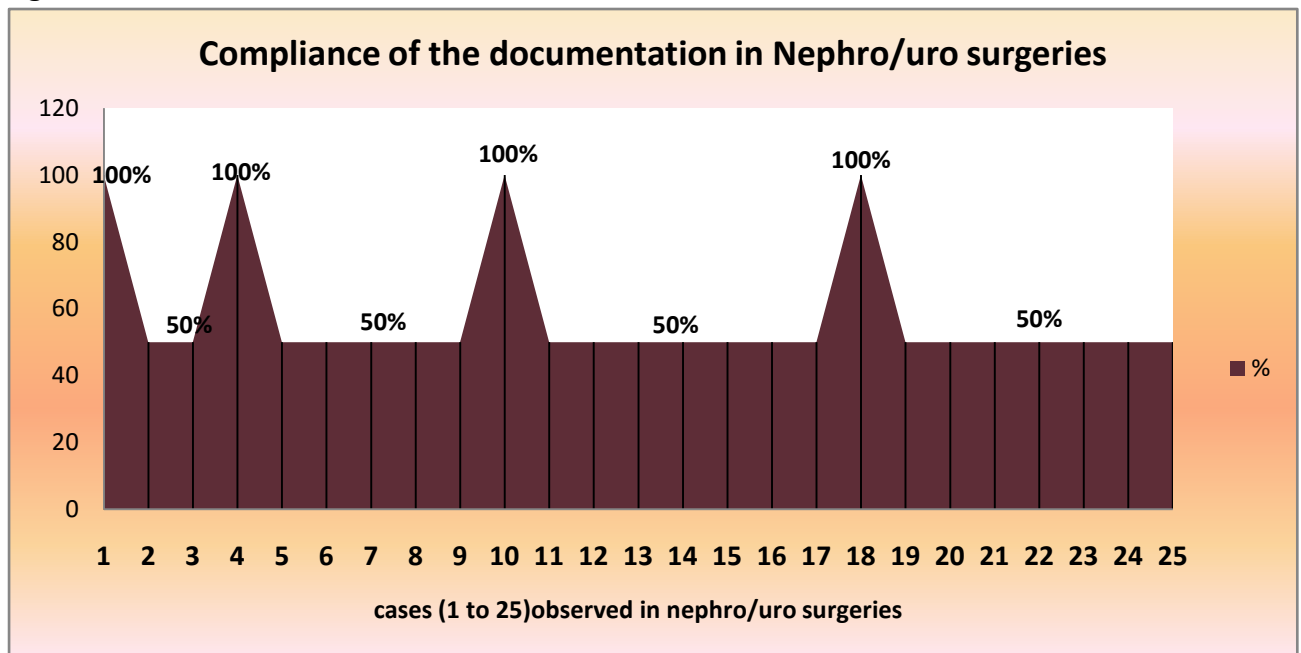
Figure 18



INTERPRETATION

In the checklist documentation 18% cases were found 100% compliant whereas the remaining cases showed 50% compliance.

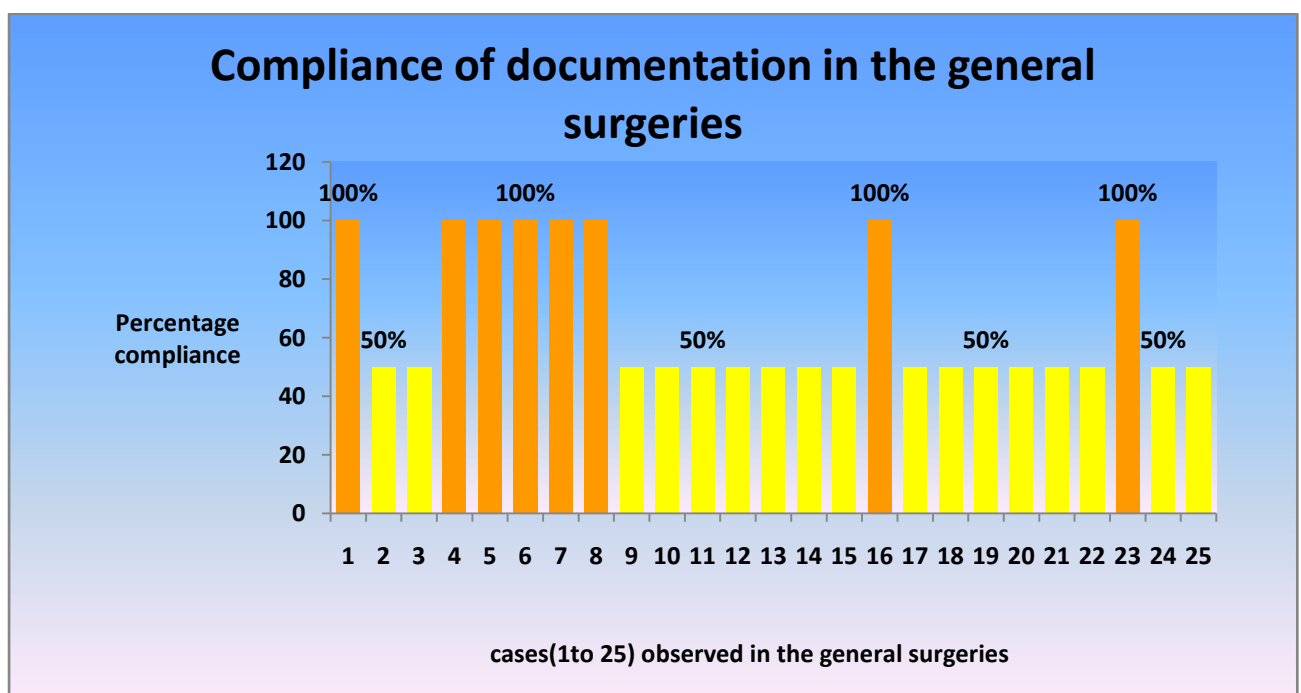
Figure 19



INTERPRETATION

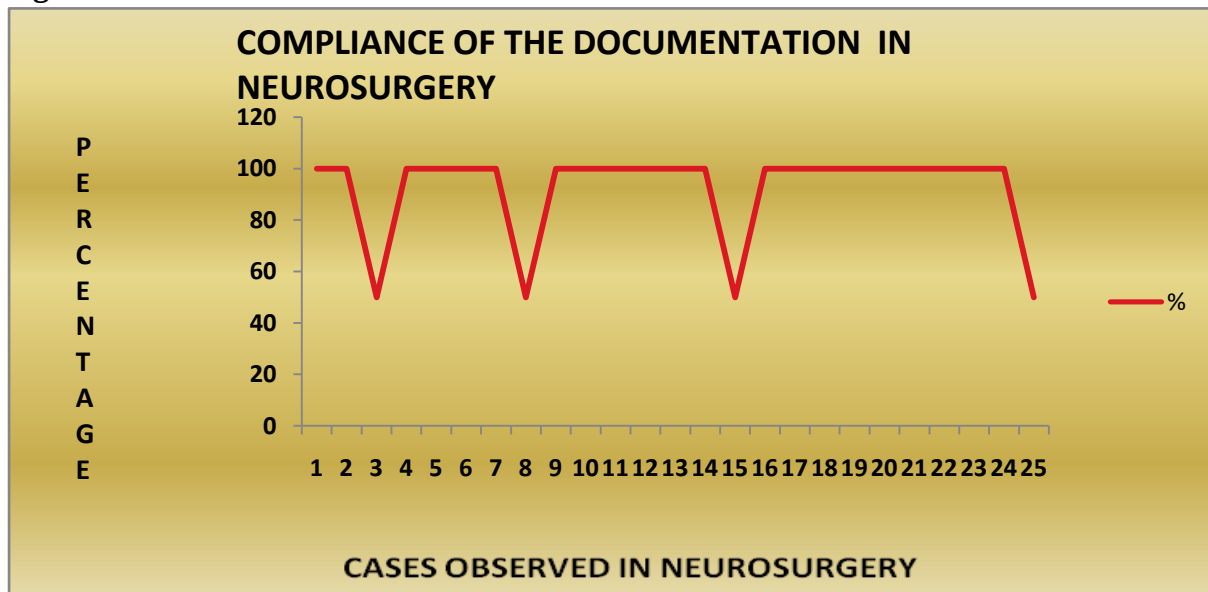
There is 100% compliance in four cases and the remaining cases have 50% compliance.

Figure 19



INTERPRETATION: There is 100% compliance in 7 cases and 50% in the remaining cases.

Figure 20



INTERPRETATION

There was 100% compliance in 22 cases and the remaining were 50% compliant.

Figure 21

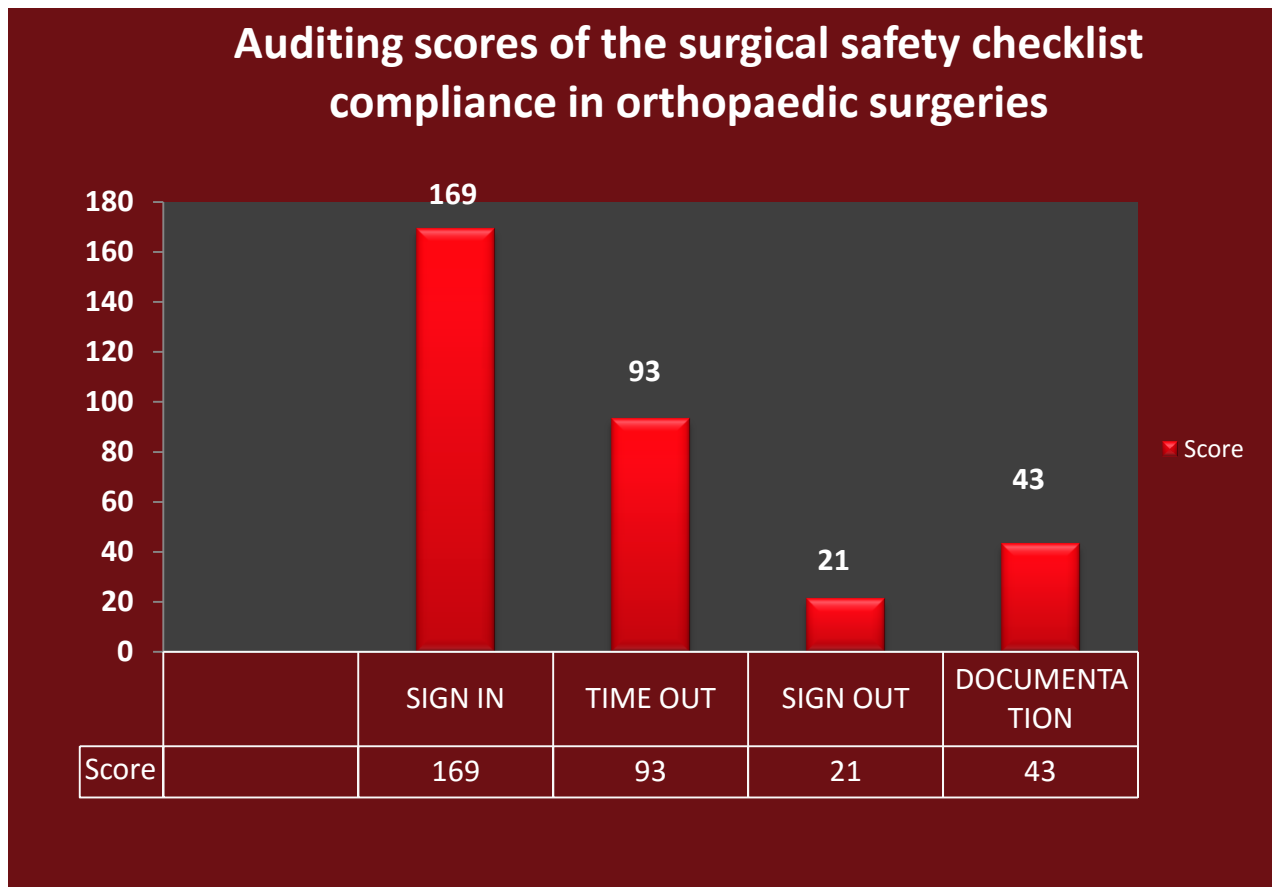
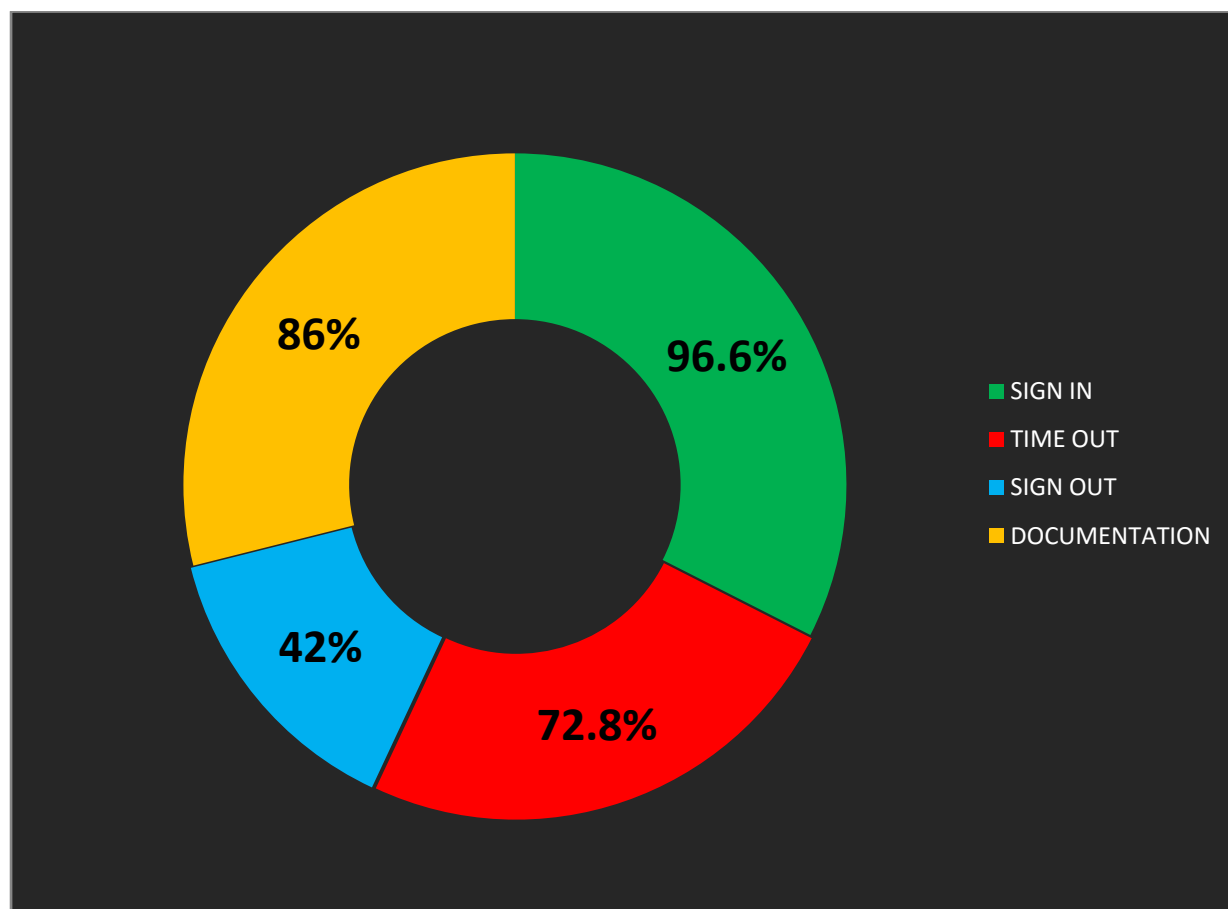


Figure 21

INTERPRETATION

The scores of sign is 169/175, time out 93/125, signout 21/50 and in the documentation 43/50.

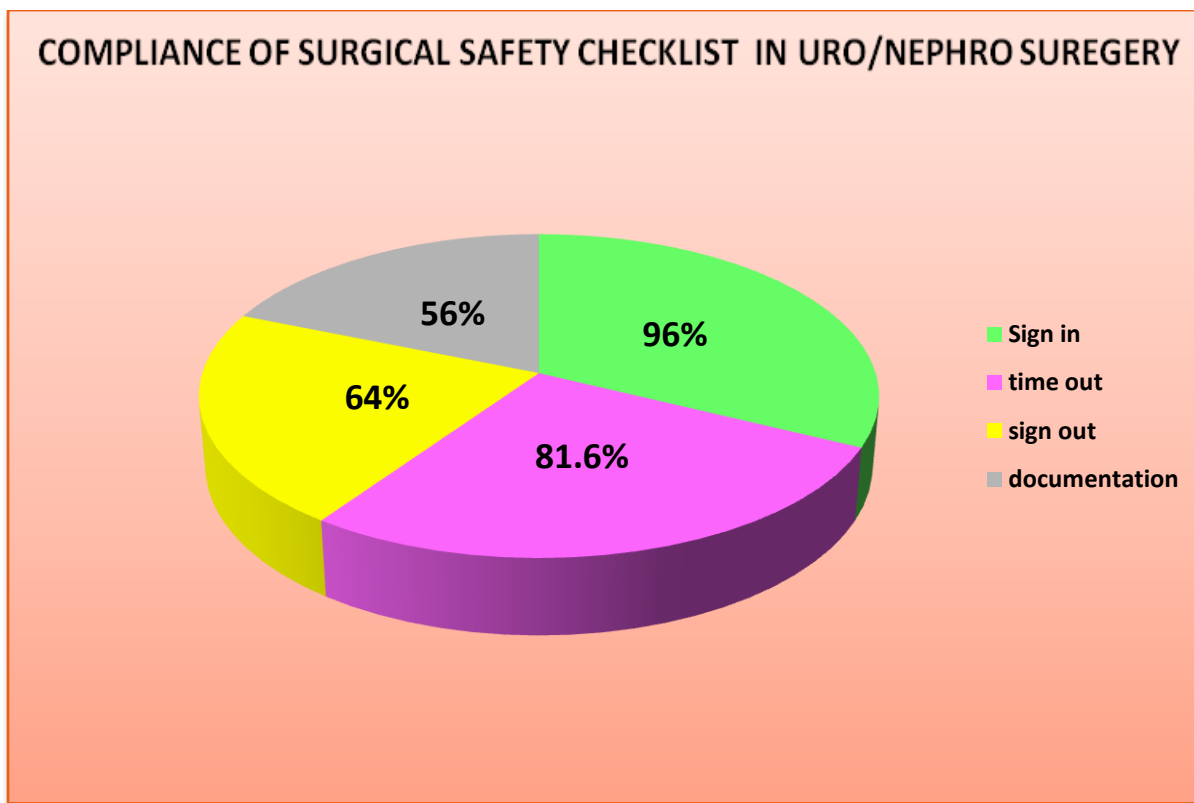
Figure 22 The compliance of the surgical safety checklist in the orthopaedic surgeries



INTERPRETATION

There was 96.6% compliance in sign in, 86% in time out, 42% in sign out whereas 72.8% in the documentation.

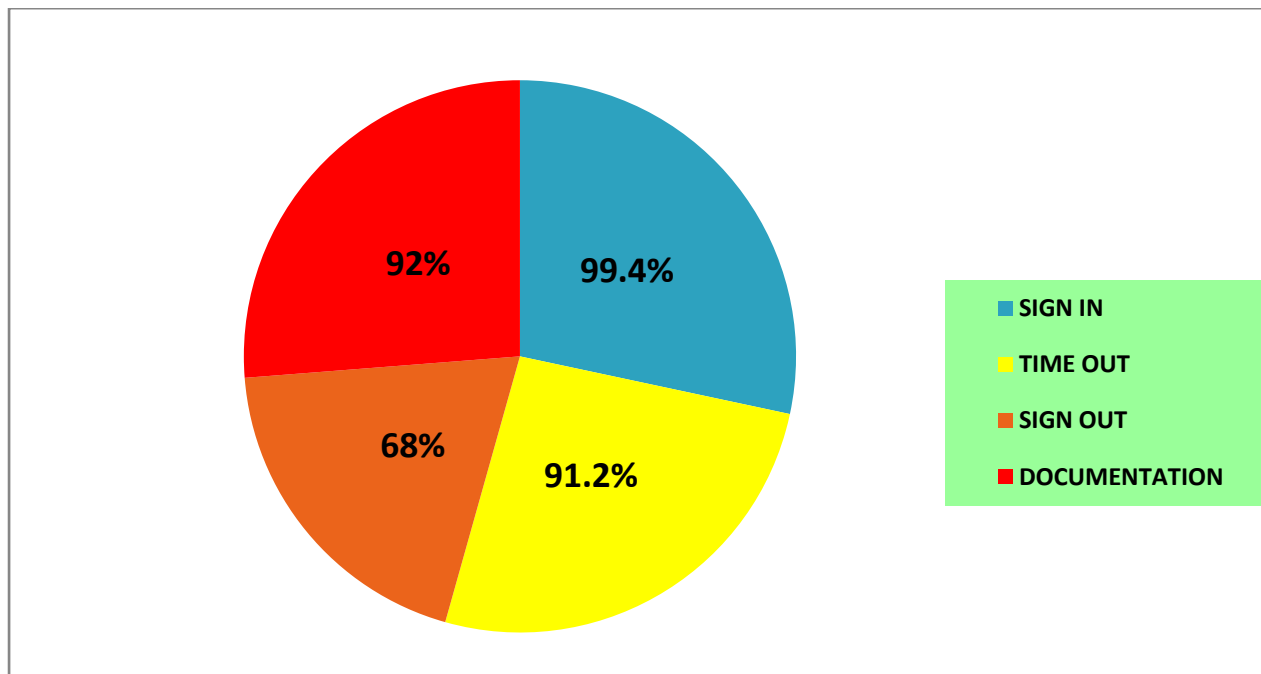
Figure 23



INTERPRETATION

The compliance of sign in is 96%, time out is 81.6%, sign out is 64% and in the documentation 56%.

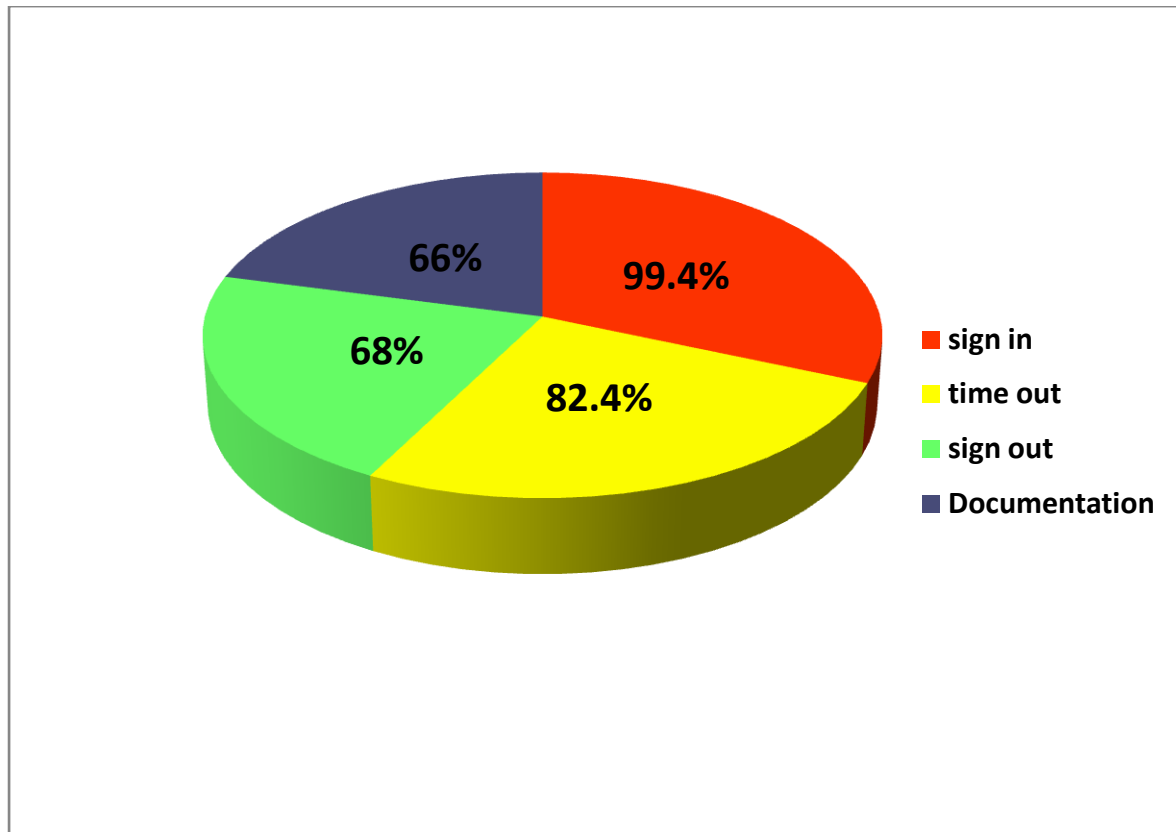
Figure 24: THE SURGICAL SAFETY CHECKLIST COMPLIANCE IN THE NEUROSURGERIES



INTERPRETATION

The compliance of sign is 99.4%, timeout is 91.2%, sign out is 68% whereas in documentation 92%.

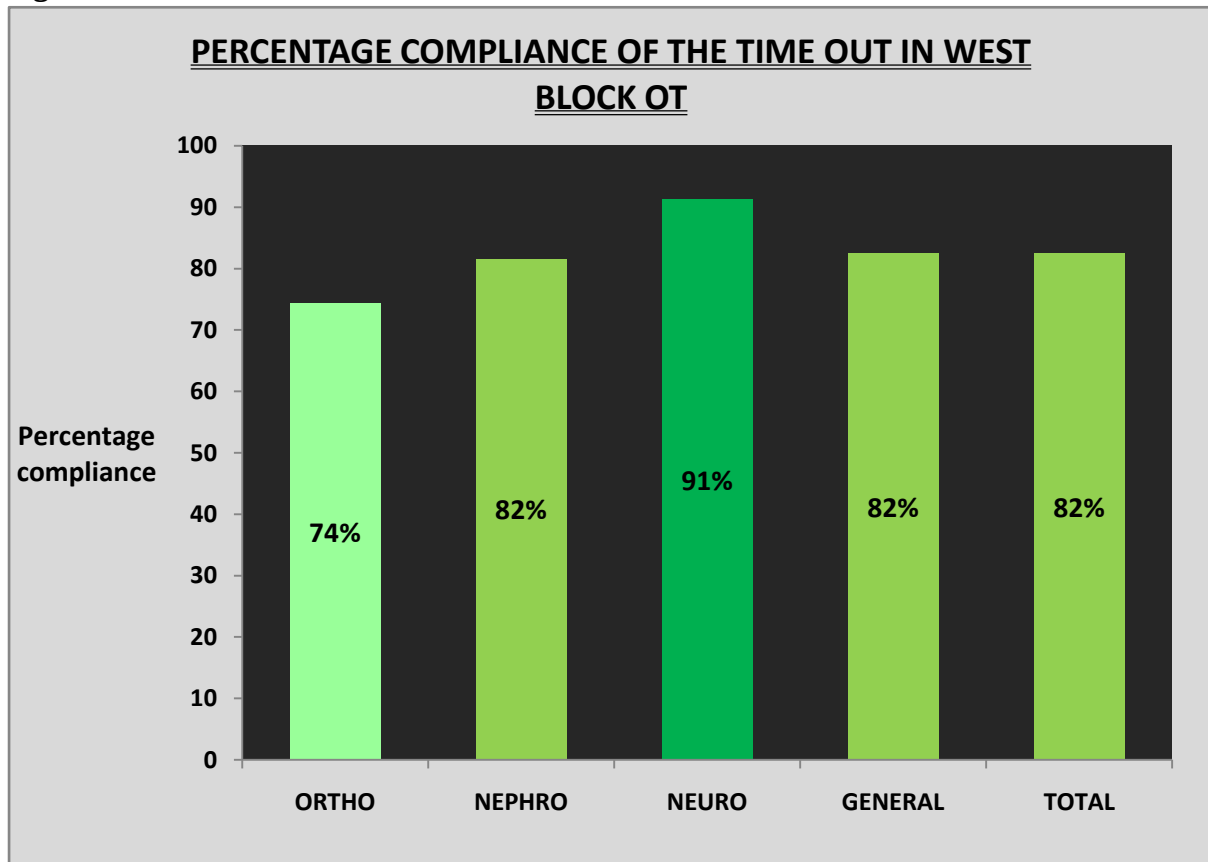
FIGURE 25: THE COMPLIANCE OF THE SURGICAL SAFETY CHECKLIST IN THE GENERAL SURGERIES



INTERPRETATION

The compliance of the sign is 99.4%, time out is 82.4%, sign out is 68% whereas it is 66% in the documentation.

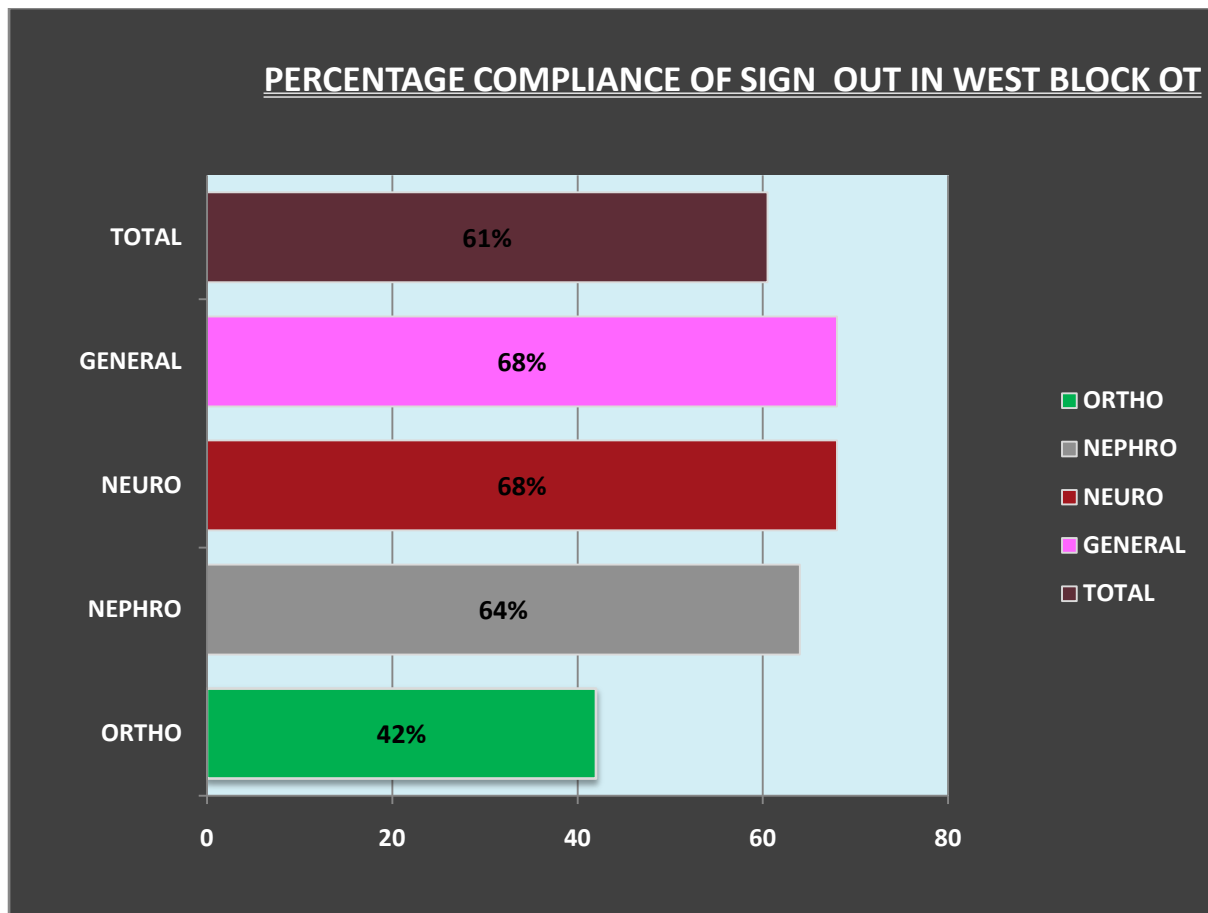
Figure 26



INTERPRETATION

There is 91% compliance of the time out in the neurosurgeries, 82% in the nephro and general and 74% in the ortho. The overall compliance of the Time out is 82%.

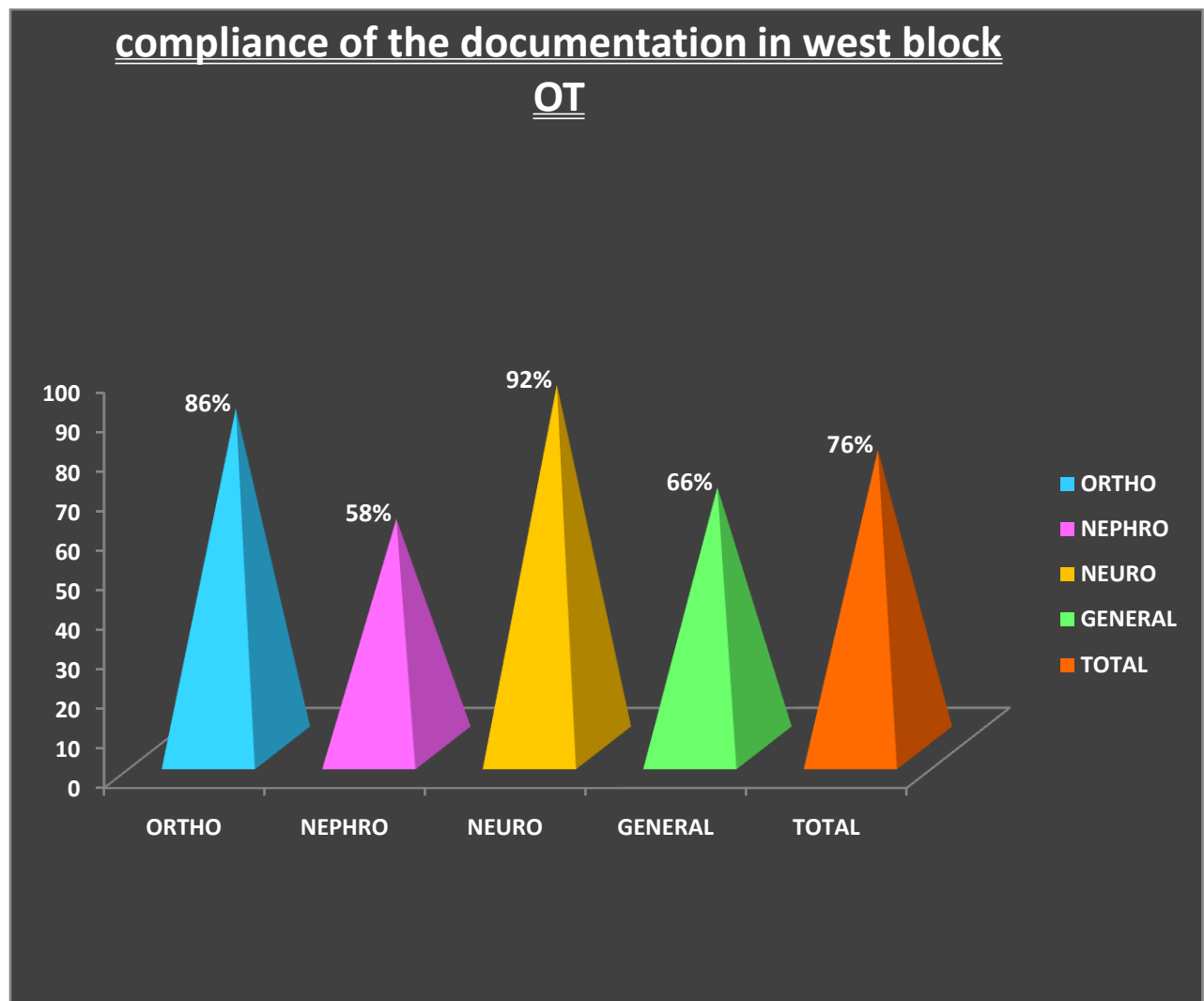
Figure 27



INTERPRETATION

The compliance is maximum in general and neuro surgeries and it is 68%. It is 64% in nephro surgeries and 42 % in the ortho surgeries.

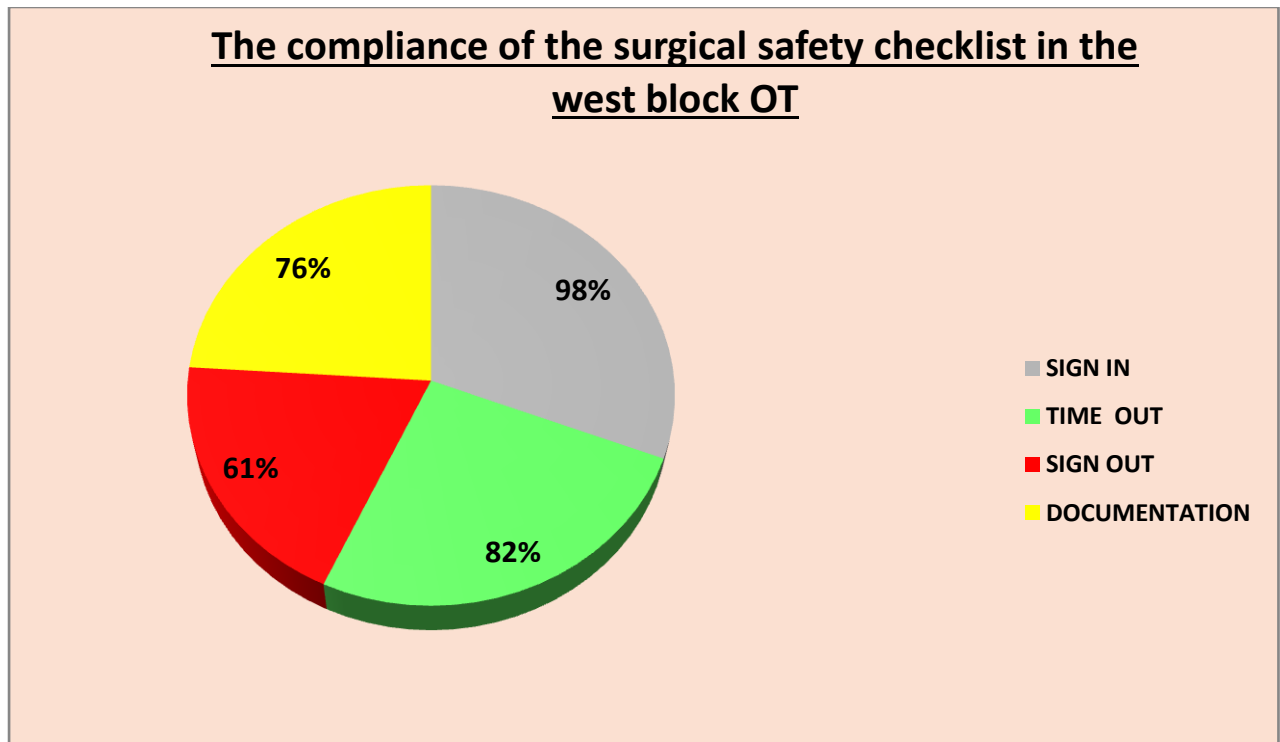
Figure 28



INTERPRETATION

It is seen that documentation has 92% compliance in the neuro, 86% in the ortho, 58% in the nephro, 66% in the general surgeries and overall compliance of 76% in the west wing.

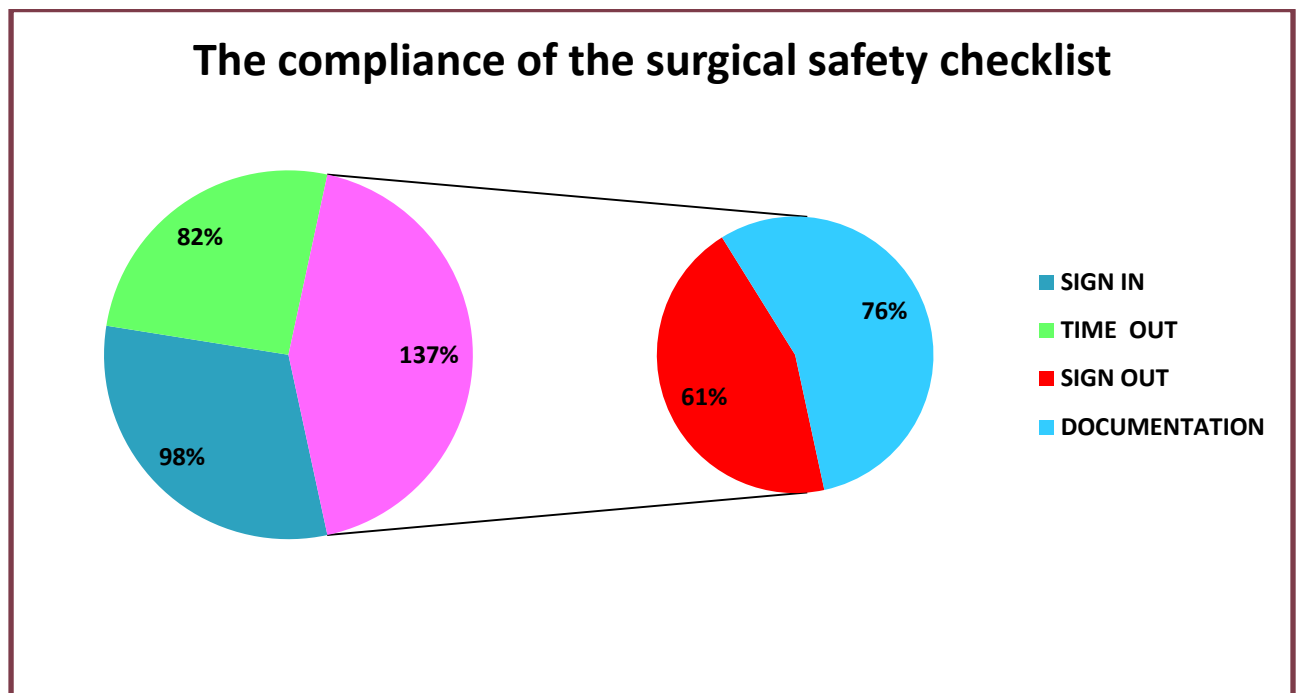
Figure 29



INTERPRETATION

The compliance of the surgical safety checklist is 98% in the sign in, 82% in the time out, 61% in the sign out and 76% in the documentation.

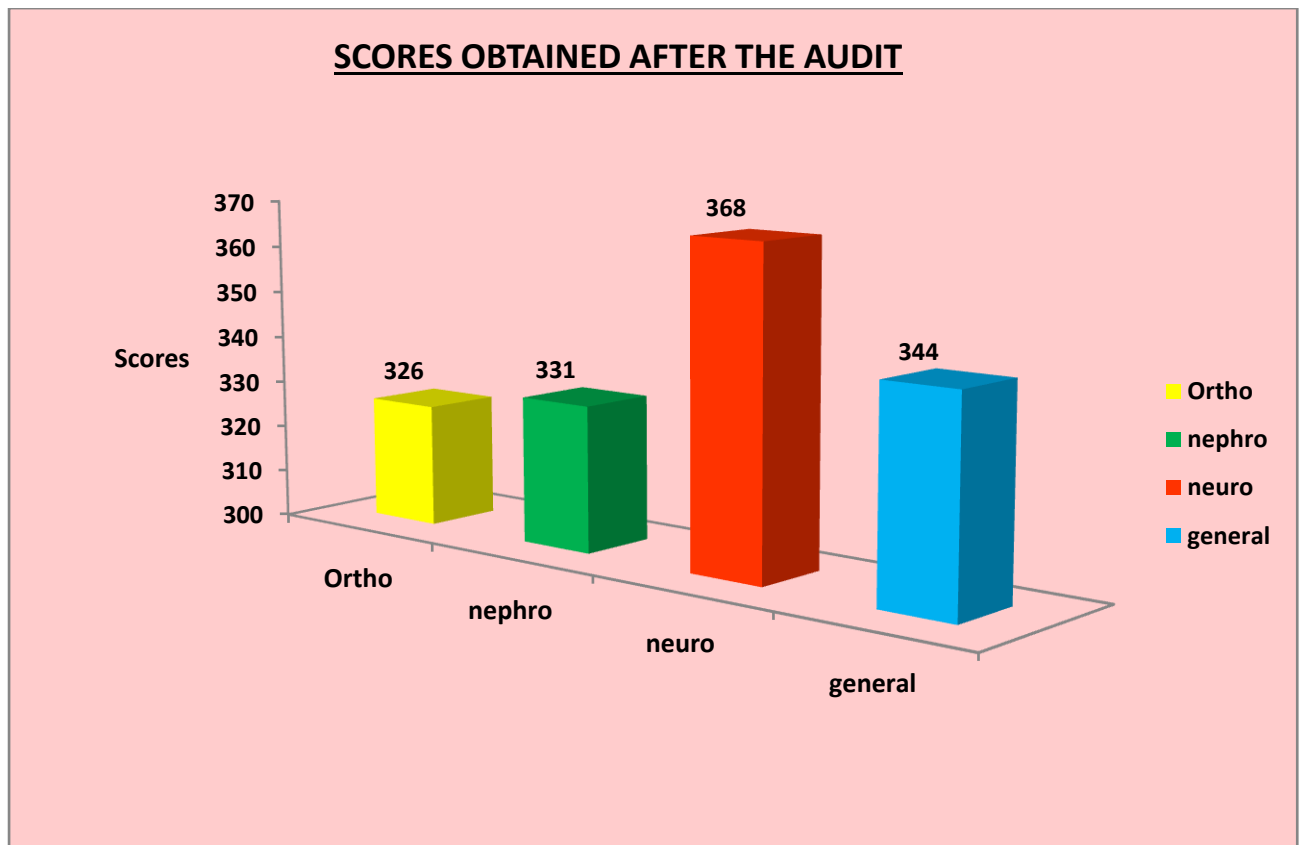
Figure 30



INTERPRETATION

The compliance of sign out and documentation is 61% and 76%.

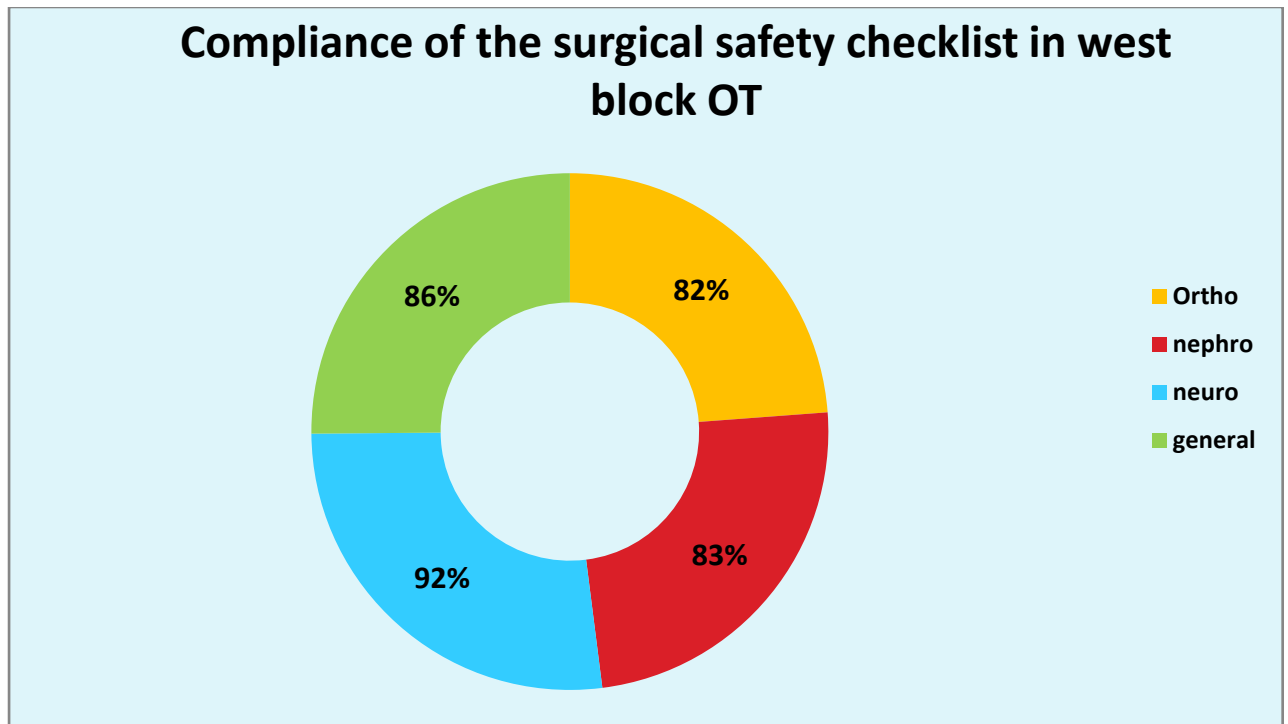
Figure 31



INTERPRETATION

The score obtained were ortho 326/400, nephro 331/400, neuro 368/400 and general surgeries 344/400 respectively.

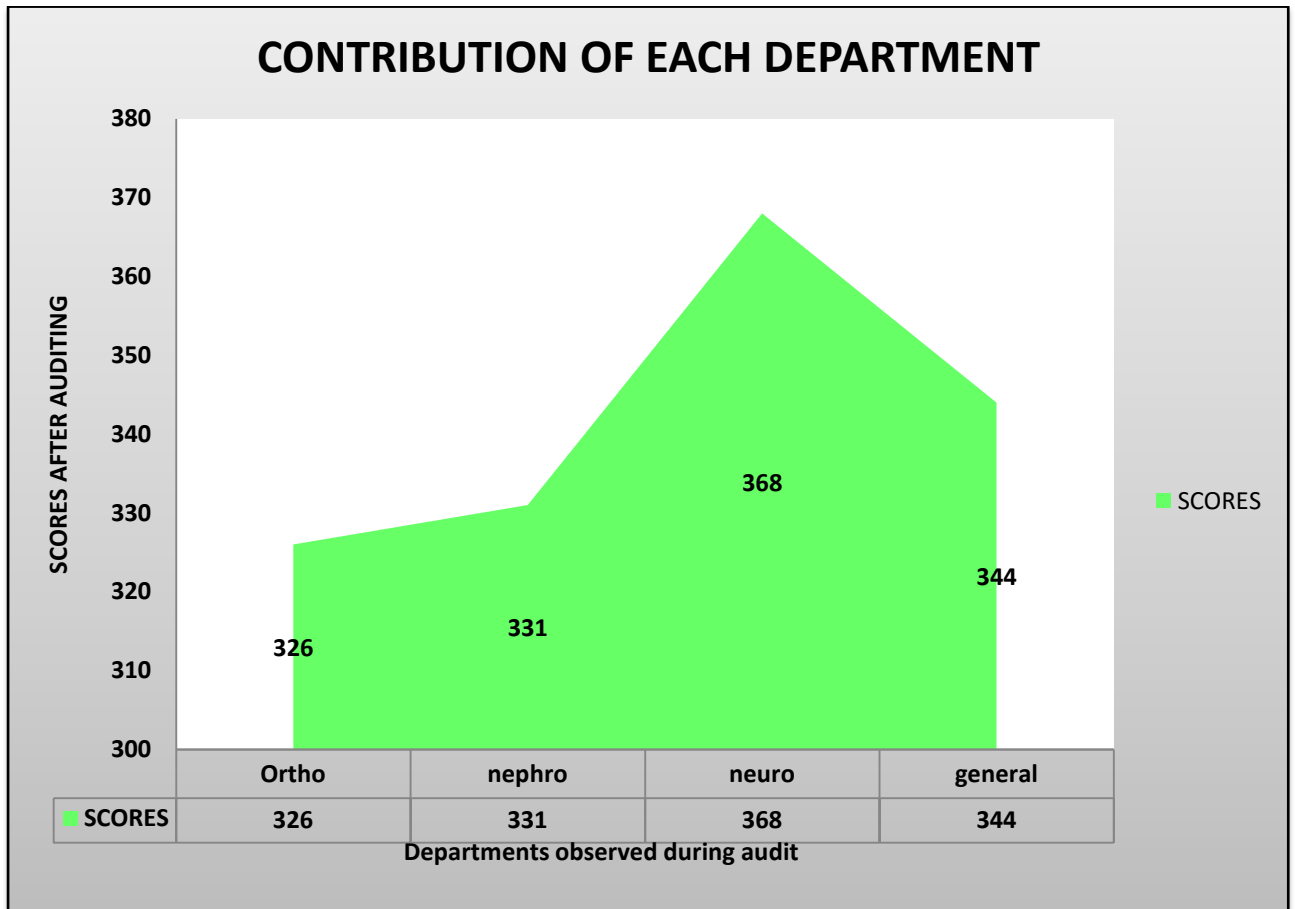
Figure 32



INTERPRETATION

The compliance in the west block OT is 82% in the orthosurgeries, 83% in the nephro, 92% in the neuro and 86% in the general.

Figure 33

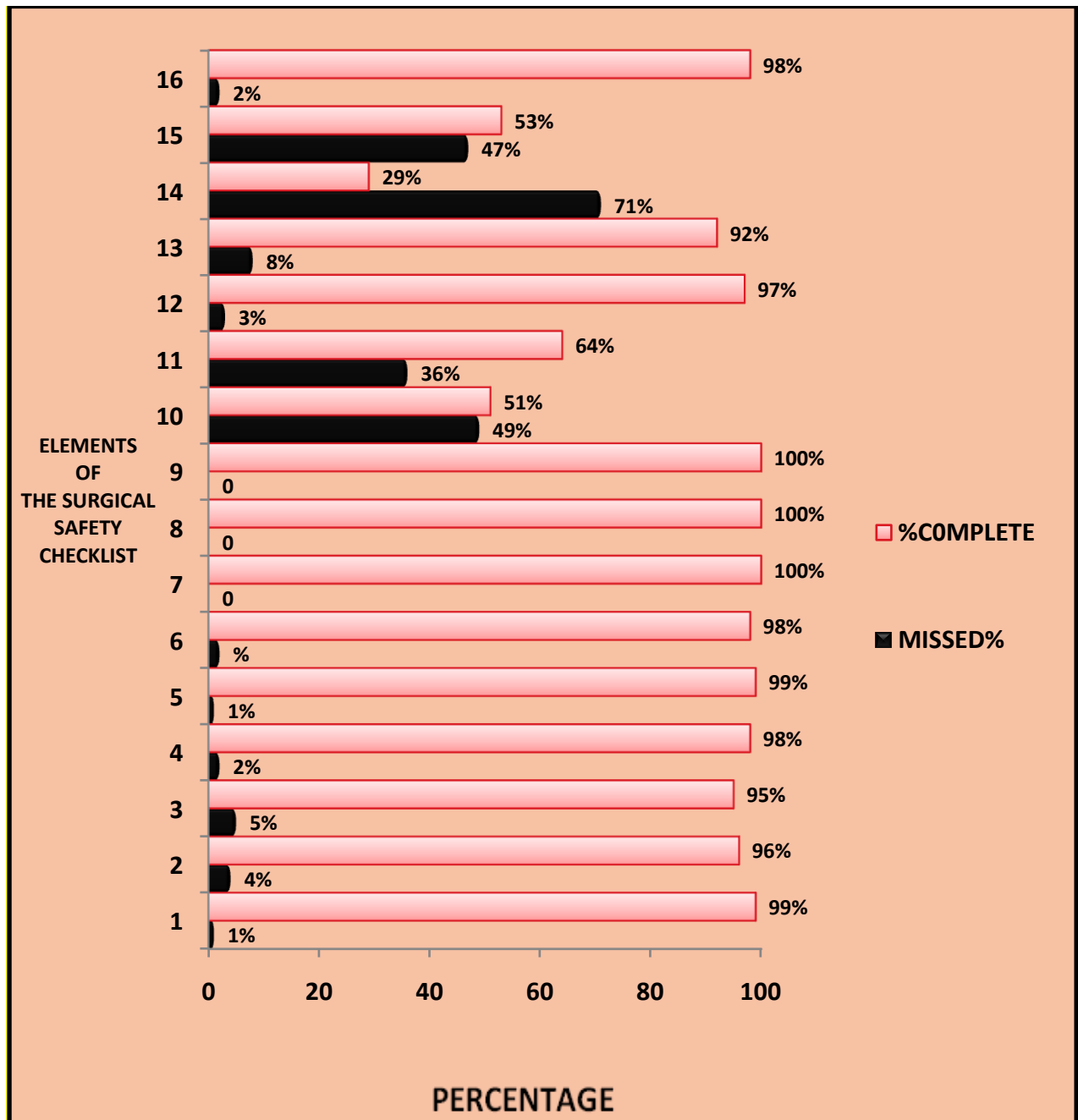


INTERPRETATION

On analyzing the scores after auditing, it is seen that the maximum contribution in maintaining the standards and requirements of the surgical safety chceklist is of the neuro department followed by the general surgery with nephro and ortho department at 3rd and the 4th position.

Figure 34

THE MISSED AND COMPLETENESS PERCENTAGE OF EACH ELEMENT OF THE CHECKLIST



INTERPRETATION

There are three elements of the checklist which are 100% complete.

Two elements are 99% complete and 3 are 98%.

The maximum missed element is element number 14 and the missed% is 71%.

RESULTS

- **The compliance of the surgical safety checklist in the West wing operation theatre Complex, Max Hospital, Saket is 86%.**
- **The compliance of the sign-in in the orthopaedic surgeries was 97%.**
- **The compliance of the sign- in in the nephro/uro surgeries was 96%.**
- **There was 99.4% compliance of sign-in in both the neuro and general surgeries.**
- **The compliance of time-out in the orthopaedic surgeries was 73%.**
- **There was 81.6% compliance of the time-out in the nephro/uro surgeries.**
- **There was 91.2% compliance of the time out in the neuro-surgeries.**
- **A compliance of 82.4% was seen in the time-out of the general surgeries.**
- **The compliance of sign out in the ortho surgeries is 42%.**
- **There was 86 % compliance in the documentation of the checklist of the ortho surgeries.**
- **Uro/nephro surgery shows 64% compliance in Sign out and 56% compliance in the documentation.**
- **The compliance of sign out in the Nephro surgeries is 68% whereas in the documentation there is 92% compliance.**
- **The general surgeries have 68% compliance in the sign out and 66% compliance in the documentation.**
- **The compliance of the sign- in in the West wing OT complex is 82%.**
- **The compliance of the Time-out is 83%, sign-out is 92%.**
- **The compliance of the documentation is 86%.**
- **There are three elements out of the 16 elements in the checklist which have shown 100% compliance.**
- **The two elements in the checklist showed 99% compliance whereas three elements were having 98% compliance.**
- **The element number 14 was having 71% missed percentage.**
- **The communication of the critical events and the key concerns among the nursing staff, surgeons and the anaesthetist is comparatively poor and need improvement.**
- **The sign in activity is excellent and have shown good results to be appreciated for.**

- **The compliance of the antibiotics within last 60 minutes of the surgery is again a matter of concern.**

RECOMMENDATIONS

- The WHO's SSC is an attempt to keep an eye on the effective management of safe surgeries in the operation theatre but its effective implementation is again equally important.
- Each and every individual working in the operating area from the nursing staff to the doctors as well as all the technicians in the operation theatre must be very well aware about this checklist and the important significance of its each and every element.
- The nurses are seen more concern about the documentation and completion of the checklist in spite of having much knowledge about it. They should know the significance and role of the checklist.
- The sign of the OT complex is good and appreciating.
- There was a gap seen in the antibiotic prophylaxis given during the surgery. A proper monitoring is required in this area for the patient safety and better quality standards.
- The sign in should be done by the anaesthetist in the presence of the technician, nurse running the checklist during the surgery to place everyone at the same platform.
- All the instruments should be ready inside the Operating room before the Time-Out so that there should be no distraction of any nursing staff and surgeon. Many a times it was seen that the Time-out was occurring but the staff was busy arranging the instruments and they were not hearing it.
- Every operating personnel should take the time out seriously and communicate all the relevant information to each and person present in the operating room.
- The anaesthetists feel their job is almost done by giving anaesthesia and hence most of them are seen absent during the time out. They should be present and

communicate necessary information to all the staff so that everyone should be at the same platform.

- There is an information board present in the OT room where all the important details of the patient is written. Many a times the details like antibiotic prophylaxis, Blood volume required are missing from the board. It should be the duty of the nurses to complete the board so that each and every person in the operating room can see the same picture.
- There should be no hurry in communicating the details as most of the information is not clearly heard and well communicated. Many a time it is seen that the nursing personnel said everything so fastly that the other person cannot even think.
- The time-out has its own significance and that should be seen in the operation theatre. The concentration of the surgeon, nurses and anaesthetists is more towards starting the surgery and hence most of the time they do not take the time-out that seriously as it is actually required.
- The sign-out of the patient again requires a lot of improvement. On observation it is seen that the surgeon was in a hurry to finish up the case that he was not even present during the time of sign out.
- The sign out requires communication of key concerns for the patient but many a times the communication was seen between the surgeons without the nursing staff having the information. The relevance of this element of SSC is to provide same picture to every operating personnel and it is seen lacking in most of the cases. It should be the duty of all the doctors to provide all relevant information to each and every person present in the theatre.
- The key concerns should not only be limited “to sending the patient into the ward, ICU, HDU”. The doctor should convey all relevant information to the nursing staff so that there should be no communication gap, which can cause problem for the patient.
- The documentation of the checklist is again an essential element to be taken care of. The duty of the nursing staff should be to check any missing name and signature and get them documented.
- The compliance of the SSC in the West Wing OT complex is 86% which is fair but there are many areas where significant improvement is required.
- A proper training Program is required for the nursing staff so that they can understand the significance and importance of the checklist for the safety of the patient.

- There should be no differences in sharing of the information between the surgeons and the anaesthetists.
- The surgeons should convey all the necessary information to the nursing staff as well keeping aside all the hierarchical differences.
- WHO's SSC is a great attempt to prevent mishaps and it should be the duty of each and every individual working in the OT complex to understand its significance and implement it effectively.

CONCLUSION

The safety of patient is a huge responsibility of the hospital. The International Patient Safety Goals (IPSG) help accredited organizations address specific areas of concern in some of the most problematic areas of patient safety. Its goal four states to ensure correct site, correct procedure, correct patient surgery in the operation theatre. The surgical safety checklist given by WHO is a very good tool to keep a check on all the required protocols to be followed during the surgery of the patient. The checklist compliance in the Max Hospital West wing is 86%. The compliance in communication of the critical events during the Time out and the key concerns during sign out is not as effective as it should be and hence need improvement whereas the sign in compliance is comparatively excellent. Despite initiatives by major health organizations to improve surgical safety there is still work to be done to ensure that events such as wrong site surgery no longer occur. Implementation of such protocols has improved patient safety and in general is viewed favourably by operating room personnel. The role of these guidelines in preventing communication error may help to reduce the incidence of wrong sided surgeries, although this has not been proven. The healthcare industry should continue to improve on the advances that have been made regarding surgical checklists and preventing wrong –site surgery

ANNEXURE

THE CHECKLIST USED FOR THE AUDIT

Before induction of anaesthesia (with nurse and anaesthetist)

	1) Patient has confirmed	
	• Identity	☐
	• Site	☐
	• Procedure	☐
	• Consent	☐
	2) Site Marked/Not Applicable	☐
	3) Anaesthesia safety check completed	☐
	4) Pulse oximeter on patient and functioning	☐
	5) Does the patient have a known allergy (yes/no?)	☐
	6) Difficult airway or aspiration risk	
No	☐	
Yes, and equipment/assistance available		
7) Risk of >500 ml blood loss (7ml/kg in children)		
• No	☐	
• Yes, and two Ivs/central access and fluids planned		
Before skin incision (with nurse, anaesthetist and surgeon)		
8) Confirm all team members have introduced themselves by Name and role.	☐	
9) Confirm the patient's name, procedure, and where the incision Will be made.	☐	
10) Has antibiotic prophylaxis been given within the last 60 minutes? Yes/not applicable	☐	

	11) Anticipated Critical Events ☐ Surgeon reviews: What are the critical or unexpected steps, operative? Duration, anticipated blood loss? Anaesthesia team reviews: are there any patient specific concerns? Nursing team reviews: has sterility (including indicator results) been Confirmed? Are there equipment issues or any concerns?
	12) Is essential imaging displayed (yes/no?) ☐
	Before patient leaves operating room (with nurse, anaesthetist and surgeon)
	13) Nurse verbally confirms ☐ • The name of the procedure • Completion of instrument, sponge and needle counts • Specimen labeling (read specimen labels aloud, including patient name) • Whether there are any equipment problem's to be addressed
	14) Surgeon, anaesthetist and nurse review the key concerns for recovery and Management of patient. ☐
	15) Signature of Anaesthetist, Surgeon, Nurse with their names ☐
	16) Documentation of the time of entry, handover to surgeon, incision time, total time of surgery, exit time. ☐

TOTAL SCORE: 16 for 16 elements

A score of 1 is given for the completion of each element of the checklist and 0 is given for each missing element

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- www.safesurg.org



**A STUDY ON OT SCHEDULING, CANCELLATION AND
DELAY IN THE SURGERIES OF WEST WING OPERATION
THEATRE**

AT

MAX SUPERSPECIALITY HOSPITAL, SAKET



Research, Jaipur

Institute of Health Management

DECLARATION

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

I would like to state that I have carried out my Internship on the topic “A study on OT Scheduling, cancellation and delay in the surgeries of the West Wing Operation Theatre” under the guidance of Dr. Sandeep More (Deputy Medical Superintendent) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfillment for the degree of MBA in Hospital and Healthcare Administration.

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

.

Dr.Akanksha Mamgain

IIHMR University

(2015-2017)

INTRODUCTION

An OT is the specialised facility of the Hospital where live saving or life improving procedures are carried out on the body by invasive methods under strict aseptic conditions in a controlled environment by specially trained personnel to promote healing and cure with maximum safety, comfort and economy.

‘Hospital Operating Theatre (OT) scheduling involves an arrangement of several operating rooms to the medical surgeons in a period of time. In the health service sector such as government or private hospitals, the scheduling of Operating Theatre plays an important role towards achieving their goals. Their main goal is to meet the patients’ satisfaction by minimizing his/her total waiting time before undergoing major or minor operations . Poor scheduling of Operating Theatre may cause longer waiting time and can also worsen the patient’s disease. In this case, an effective schedule has to be developed in order to improve the reputation and performance of government as well as private hospitals.

Key elements to efficient use of operating theatres are:

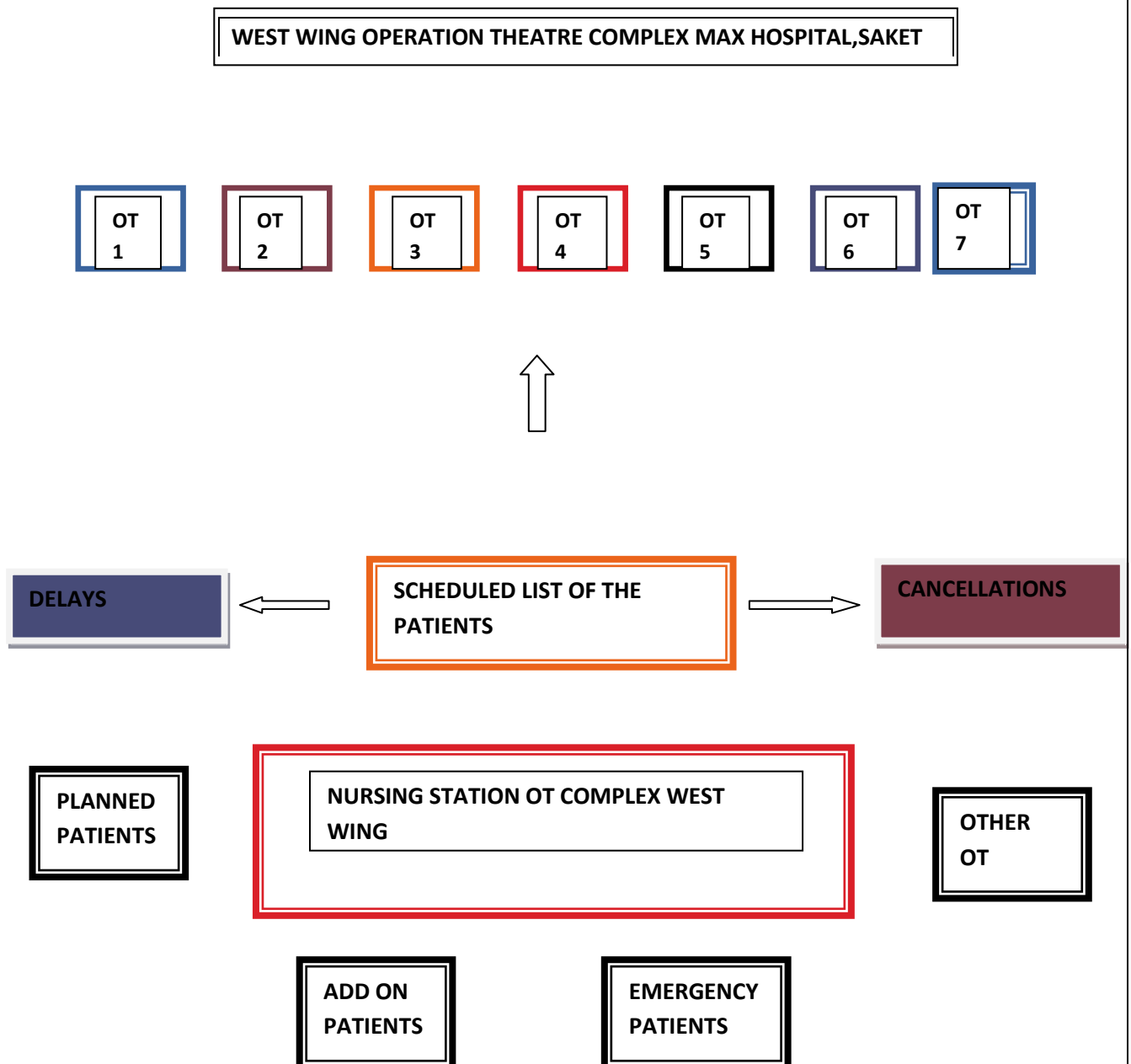
- Effective management
- Good communication
- Well trained staff
- Appropriate facilities and equipment
- Operational layout that allows smooth flow of the patient

Effective planning and scheduling systems will enable smooth patient flow thus increasing capacity, improving patient and carer experience, improved employee satisfaction and morale.

Operating rooms are simultaneously the largest cost centers and the greatest source of revenues for most hospitals. OT planning and scheduling is a key tool which can be useful to improve the productivity level of Operating rooms and the related departments.

The west block OT complex of Max Hospital, Saket is located on the first floor. There are seven operating rooms in the complex. The major surgeries done in this complex are neurosurgeries, nephro and uro surgeries, general surgeries including gynae and obs and the orthopaedic surgeries. The schedule of the surgeries for the next day is prepared in the OT itself and is ready by evening 6’oclock. This scheduled list contains the name of the patient planned for the surgery.

The scheduling list contains the name of all those patients who have planned their surgeries and have done their OT booking by paying 2500 Rs as the fees. The cancellation, planning the surgeries of the unplanned patients and the continuous updating of the list is done by the nursing staff of the operation theatre complex. There are three nurses for general surgeries and ortho surgeries, two for neuro surgeries for this work. There are certain timing slots in the OT booked in the name of specific consultant



REVIEW OF LITERATURE

Health care expenditures comprise a meaningful portion of the Gross Domestic Product in both developed and developing countries. Expenditure on healthcare in the UK as a percentage of the UK Gross Domestic Product (GDP) was estimated to be 8.4% in 2007, from which the public share was 69%. Also, according to the statics released by the WHO (World Health Organization), health care expenditures in 2007 in Iran as a developing country were estimated to be about 6.4% of its GDP, and the portion covered by the government was about 46.8%. This fact makes health systems an important research field for industrial engineering and operations research to improve their operational efficiency.

Case scheduling or correctly selecting the day on which to do each elective case so as to best fill the allocated hours is most important, much more so than, for example, correcting errors in predicting how long elective or add-on cases would last, reducing variability in turnover or delays between cases, or day-to-day variation in hours of add-on cases. Poor scheduling is often the cause of lost OR time. To more efficiently operate a surgical setting, managers may consider centralizing all scheduling to the operating room suite itself. Ideally, holding patient and surgeon preferences constant, an operating facility can identify cases and appropriately place them into predetermined time slots, or blocks. Health care expenditures comprise a meaningful portion of the Gross Domestic Product in both developed and developing countries. Expenditure on healthcare in the UK as a percentage of the UK Gross Domestic Product (GDP) was estimated to be 8.4% in 2007, from which the public share was 69%. Also, according to the statics released by the WHO (World Health Organization), health care expenditures in 2007 in Iran as a developing country were estimated to be about 6.4% of its GDP, and the portion covered by the government was about 46.8%. This fact makes health systems an important research field for industrial.

Basically, there are three OR scheduling strategies commonly employed :(1) blocked scheduling strategy, (2) open scheduling strategy, and (3) modified scheduling strategy.

Under a blocked scheduling strategy, individual surgeons or surgical groups are assigned times in a particular OR in a periodic (typically weekly or monthly) schedule. The planning within the framework of a blocked strategy consists of three stages. In the first stage, the OR

capacity is divided among the surgeons, surgical groups, or departments on a strategic level. Then, a cyclic timetable called “Master Surgical Schedule” is constructed that defines the number and type of operating rooms available, the hours that ORs will be open, and the surgical groups or surgeon sessions for each OR. The last stage which may be called “surgery process scheduling” splits into two subproblems called “advance scheduling” and “allocation scheduling”. The first subproblem at a tactical level (one week to one month) solves a planning phase by assigning an operating date to each patient over the time horizon. The second subproblem solves a scheduling phase which determines the sequence and resource allocation of cases in a given day.

In the open strategy, the hospital does not hold operation rooms specific to a single surgeon although there is sometimes a weekly schedule for each surgeon. In this strategy, the intention is to accommodate all patients. The surgeons submit cases up until the day of the surgery, and all the cases are scheduled in ORs.

The modified strategy is similar to the blocked one except that certain slots in the master surgical schedule are left open for flexibility. In fact, this strategy is a mix of open and blocked strategies

The reported rates for day-of-surgery cancellation rates vary widely among institutions from 10-40 %. We found that 30.3 % of all scheduled elective operations in general surgery were cancelled on the day of surgery. Fischer reported that almost 90% of operating room (OR) cancellations are day-of-surgery cancellations.

Jonnalagadda et al reported the reasons for cancellation of scheduled routine and emergency cases as non-availability of beds in the recovery room (15%), improper preoperative patient preparation (13%), patient not showing up (9%), and unavailability of staff (19%) Schofield et al in their study of cancellation of intended surgery at a major hospital in Australia reported 941 (11.9%) cancellations out of 7913 theatre sessions. The reasons included no bed available (18.9%), run out of theatre time (16.1%), patient non-arrival (10.5%), patient unfit (9.2%), and cancelled by patient or relatives (8.2%). Windokun et al reported that only 38% of the booked surgery was performed and the reasons for such cancellation included

‘surgeons did not show up’ (62%), ‘surgery postponed by surgeons’ (18%) and ‘patient ill prepared for surgery’ (10%).

In our study non-availability of OR time was the most common reason. W An analysis in USA examining 56,000 cases retrospectively found that 31% of lists were predictably overbooked. Moreover, unforeseen anaesthetic or surgical problems may delay the planned list. The time taken for a particular surgery also depends on the skill of operating surgeon. Less experienced surgeons and trainees often take more than the expected time. For some surgeries the total duration exceeded the usual surgical time due to an unexpected surgical complication, juniors being taught and allowed to do the surgery especially for laparoscopic procedures, unavailability of sterilized instruments, and technical problems in instruments. Medical cancellations are generally presumed to be another reason of cancellations. Because cancellations caused by medical problems are especially upsetting for patients and can be more contentious for members of the medical staff these cancellations may be more memorable than other types of cancellations. Inadequate preoperative medical optimization was another important reason for cancellation of cases in our study. The major reasons were hypertension, recent onset respiratory tract infections, uncontrolled diabetes and an acute onset cardiovascular abnormality. Some cancellations due to failure to comply with the preoperative orders and the development of a medical illness can be minimized by a preoperative visit by the anaesthesiologist and the surgeon a day prior to scheduled surgery.

Last-minute cancellation due to failure of a patient to present is especially difficult to resolve. It may be due to the patient's last minute doubts and fears. Efforts should be made to improve patient communication and facilitate their compliance with scheduled procedures. Paschoal reported that 54.3% cases of the total cancelled cases were due to absenteeism of the patient because of unawareness of the date of surgery, clinical problems like respiratory tract infections and social/economical reasons.

RATIONALE

This study is indented to observe the scheduling of the surgeries in the West Wing operation theatre of the Max Hospital, Saket. The observation will help, in understanding the process of planning a schedule for the surgery. It will provide an insight to the cancellation, delays and unplanned surgeries and the loopholes associated with the same.

This study is done to understand the areas of improvement during the complete process. It also provides a good information regarding the difficulties faced by the patient, the doctor's and the OT staff during the complete process.

OBJECTIVES

- To analyze the complete process of scheduling in the operation theatre complex, West Wing, Max Hospital, Saket.
- To observe the number of cancellation and delays in the entire process.
- To find out the reasons behind all the cancellation and delays in the surgery of both planned and unplanned cases.
- To observe the difficulties and challenges faced by the patients, doctor's and the OT staff during the entire process.

METHODOLOGY

- **Type of study** : Observational cross-sectional
- **Study population** :Patients, Doctors, Nurses, Patient care co-ordinators in the operation theatre complex , West wing , Max Super Speciality Hospital, Saket, Delhi
- **Study area** – Operation Theatre complex west wing, Max Hospital, Saket, Delhi
- **Duration of Study** – 15th April , 2016 to 30th April, 2016
- **Type of Data** - Quantitative
- **Technique** – Direct Observation of patients, nurses, doctor's and OT staff
- **Sample size** – 302
- **Sampling technique**- probability sampling
- **Inclusion criteria**-
 - ❖ Patient's,Doctor's, Nurses in the operation Theatre complex, West wing, Max Hospital, Saket
- **Data collection** - Primary and Quantitative (2 weeks)
- **Data entry**- Manually
- **Data Analysis**- Using bar charts, pie charts

DATA ANALYSIS

Figure 1

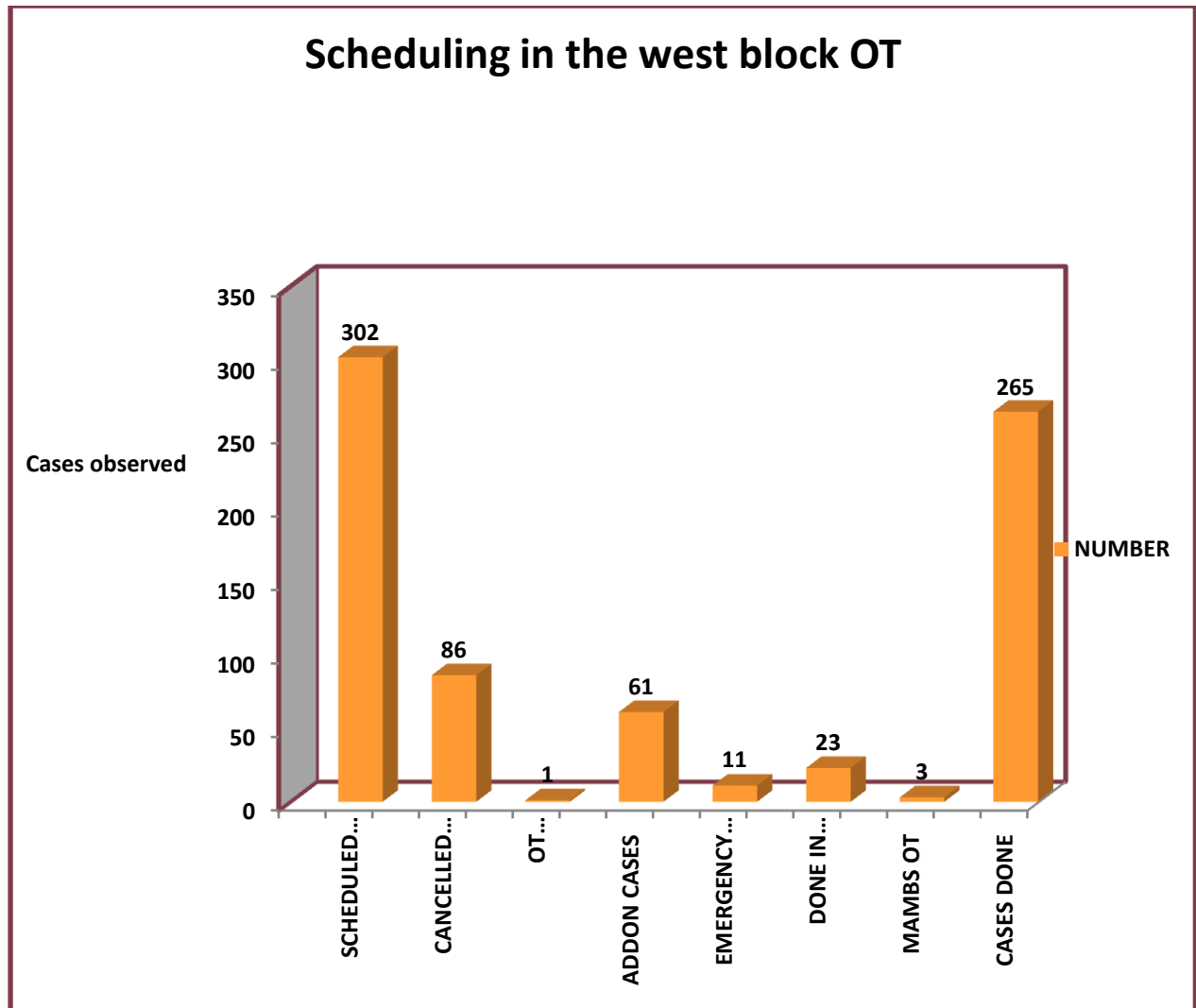


Figure 1

INTERPRETATION

It has been observed during the study that 86 cases were cancelled, there were 61 addon cases, 11 emergency cases, and 23 are those done in other OT.

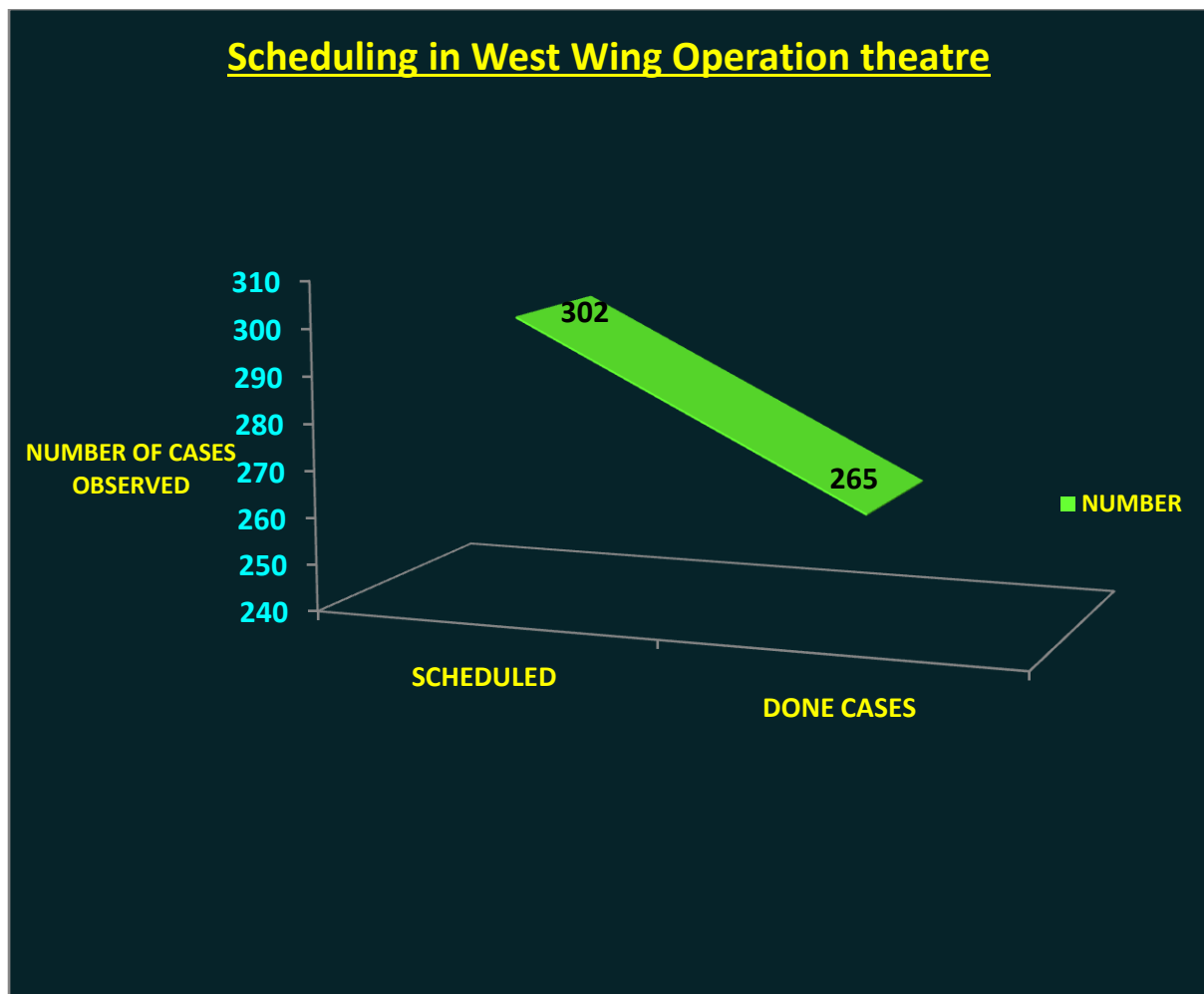


Figure 2

INTERPRETATION

It is observed during the study that out of the 302 cases scheduled for the surgery, 265 cases were completed on the similar day.

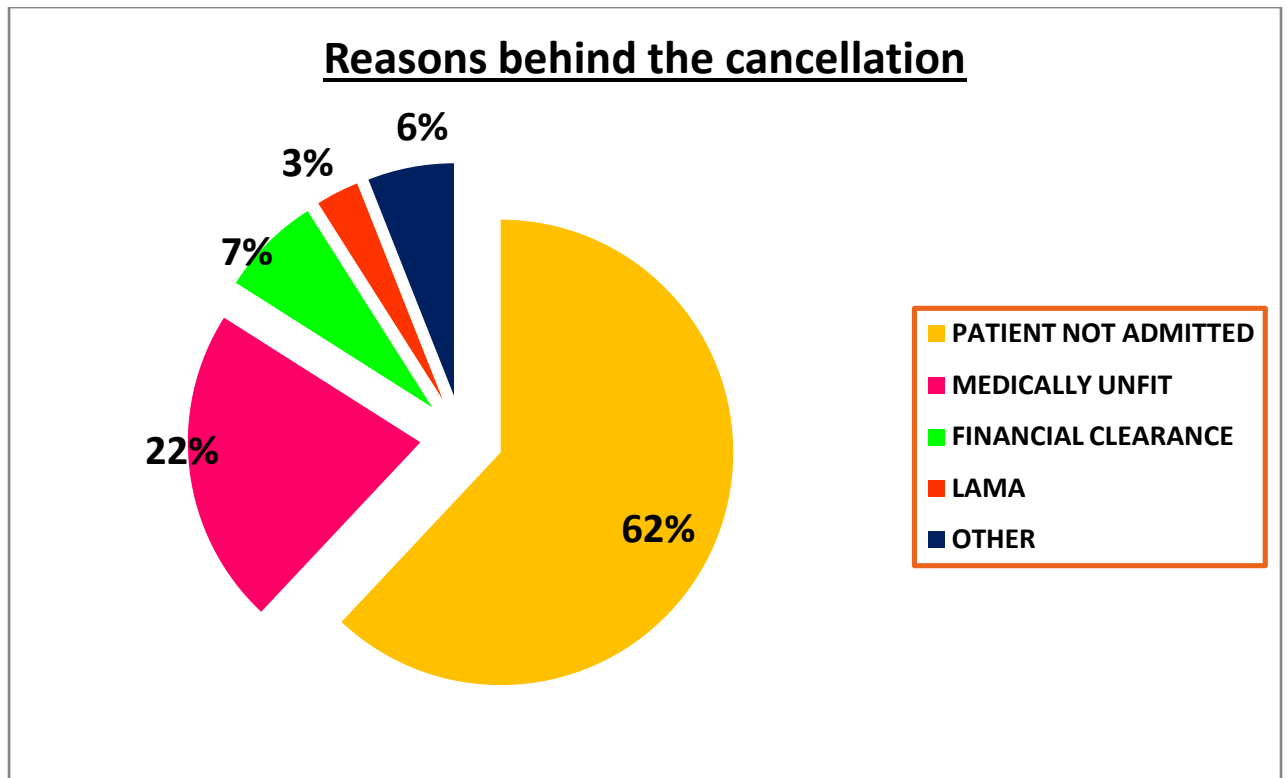


Figure 3

INTERPRETATION

It is seen that 62% belong to the patients who are not admitted inspite of the planned surgery booking. There are 22% who are medically unfit, 7% are those having no medical clearance, 6% leave against medical advice.

The number of cases scheduled and done in the West Wing operation theatre complex

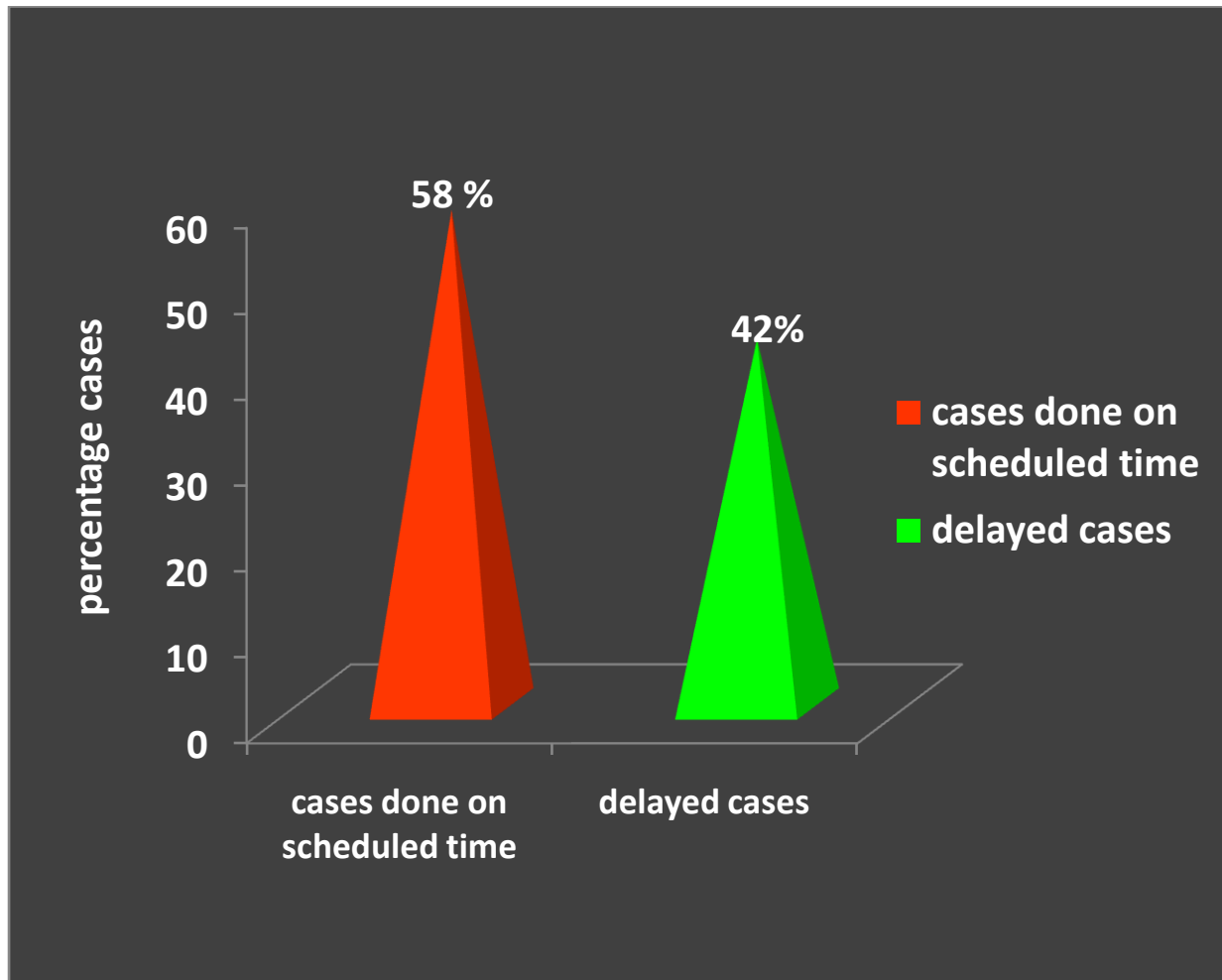


Figure 4

INTERPRETATION

On observing the data it is seen that out of the 80 cases done 58% were done on the scheduled time whereas the remaining 42% are delayed due to specific reasons

The reasons behind the delay in the surgeries (planned/unplanned) in the Operation theatre complex west wing, Max Hospital, Saket

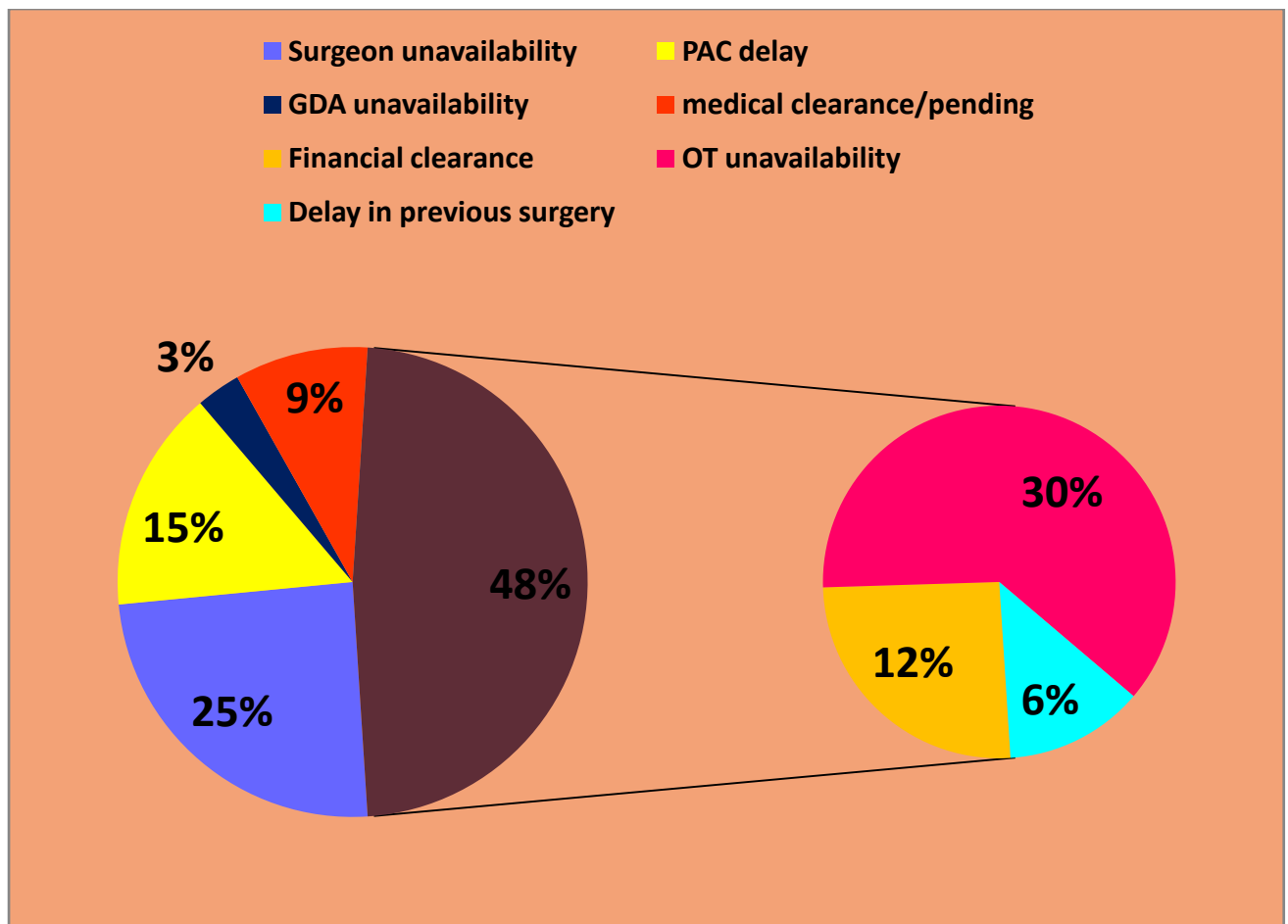


Figure 5

INTERPRETATION

There are many reasons behind the delay in the operation theatre. It is seen that 30 % delay is due to the unavailability of OT, 25% due to surgeon's unavailability, 15% is due to the delay in the PAC in the wards, 9% is because of the medical clearance and the remaining 3% is due to GDA unavailability.

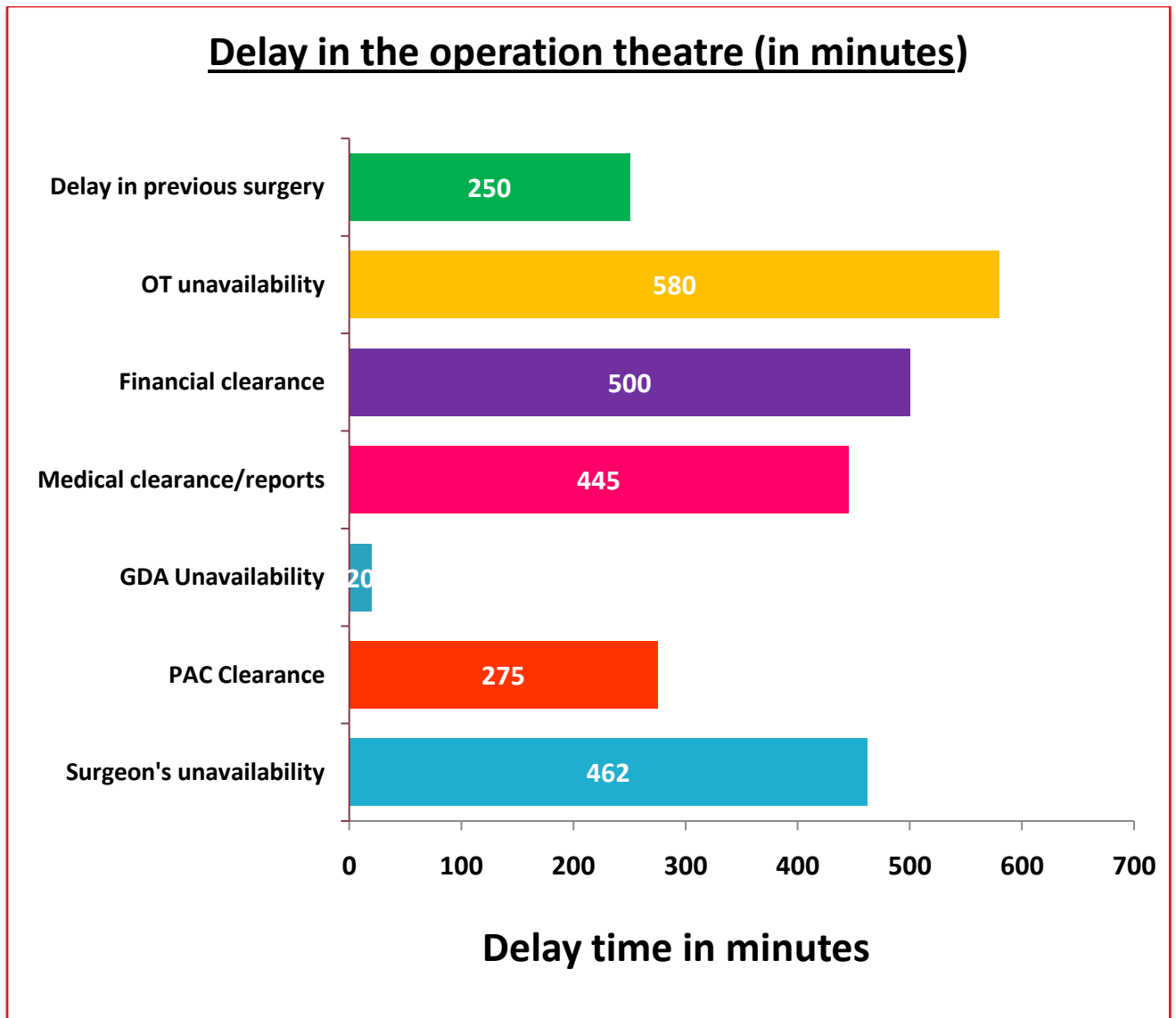


Figure 6

INTERPRETATION

It is seen that the maximum delay of 580 minutes is associated with the unavailability of Operation theatre, 500 mins delay is due to the delay in the financial clearance of the patient. There was 462 mins delay reported in the surgeon's unavailability. The medical clearance took 445 minutes and PAC clearance was 275 minutes. The GDA unavailability was recorded as 20 mins delay in the complete process.

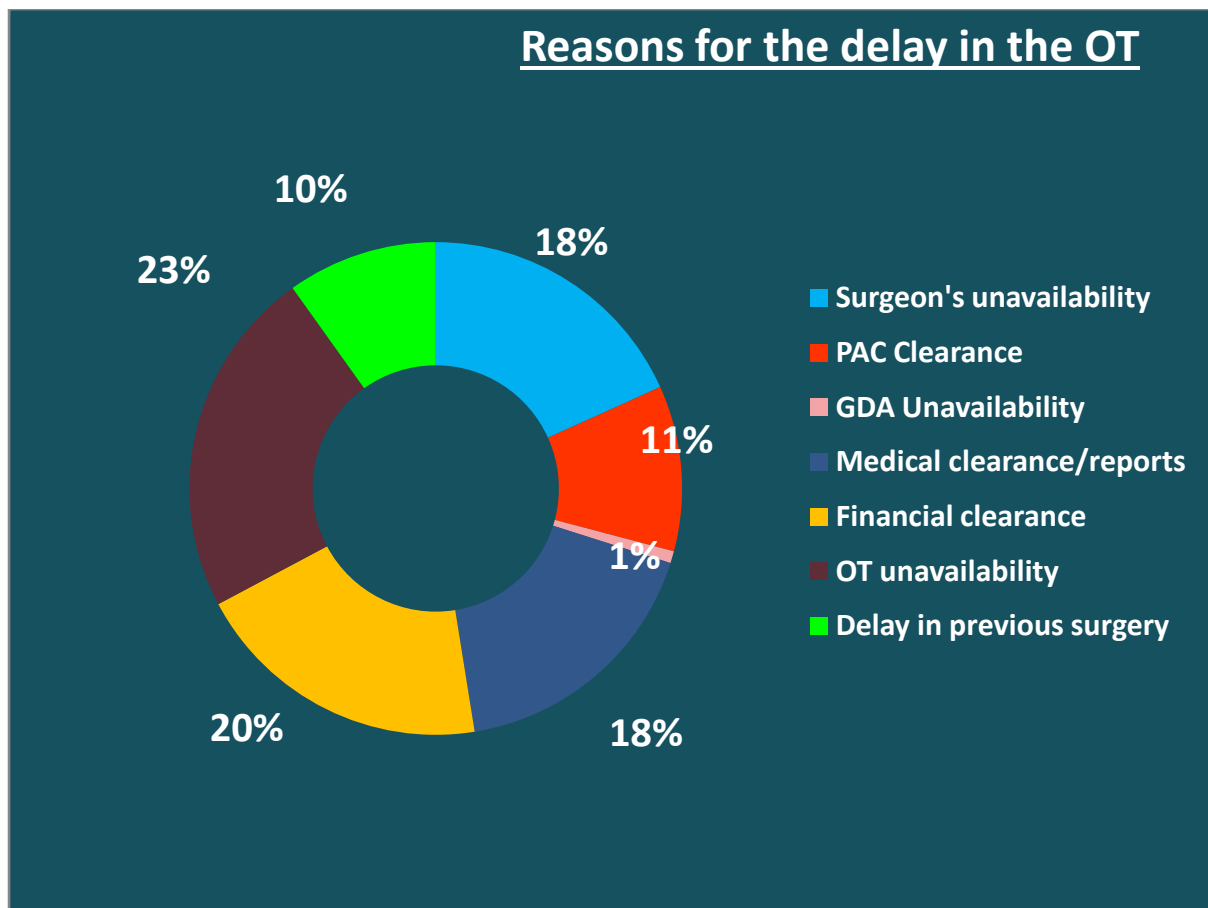


Figure 7

INTERPRETATION

A delay of 23% was recorded with OT unavailability. Another significant reason which came ahead was financial clearance and it accounts to 20% of time. The unavailability of surgeon and medical clearance was 18% each. There was a delay of 11% with the PAC clearance, 10% was due to the delay in previous surgeries and 1% is a reason behind was the unavailability of the GDA.

DISCUSSION & RESULTS

- The schedule of the list of the surgeries is prepared inside the OT by the OT staff by the confirmation from the IPD department and there is fees of Rs 2500 for the same. This money is non-refundable.
- The list is ready with the staff a day before surgery.
- The slots of the surgeon's are booked according to the number of surgeries.
- The cancellation cases are high compared to the cases done and the major reason is cancellation on part of the patient himself. The other significant reason behind the cancellation is Financial clearance, Medically unfit patient, patient leaving against the medical advice.
- A delay in the surgeries were seen in 48% of the cases. There were 52% surgeries which happened at the scheduled time.
- There was a significant delay of 2532 mins in the observed cases.
- There were many reasons behind the delay which include OT unavailability, Financial clearance, surgeon's unavailability, delay in medical reports, PAC clearance, GDA unavailability etc
- There was a delay of 580 minutes due to the OT unavailability and 500 minutes in the financial clearance.

SUGGESTIONS & RECOMMENDATIONS

- 1.** The scheduled list should contain names of the patients who have given a significant amount for the surgery and have given conformation about it.
- 2.** The surgeon's, anaesthetists should have a finalized list of the patients who have given confirmation for the surgery.
- 3.** There should not be any prior booking of the slot in the name of the patient who has not given confirmation.
- 4.** There should be a reasonable amount for the surgery booking to avoid the cancellation at the later stage.
- 5.** The patient should be scheduled only after the fiancial clearance.
- 6.** The anaesthetists should have the list of scheduled surgeries to avoid PAC Clearance in the ward.
- 7.** There should be a turnaround time for the PAC clearance as it is one of the significant reasons for the delay.
- 8.** The slots should be booked according to the surgeries not at the name of the doctor.
- 9.** All staff concerned with the operating schedule should be punctual to ensure cases are done at planned time.
- 10.** The operating list should be made judiciously. Meticulous care and proper planning must be taken to complete the OR list daily.
- 11.** It is the duty of the theatre-in-charge in consultation with surgeons to ensure that there is no wastage of operating timen or is there over-crowding of the list leading to postponement of surgery. Any postponement of surgery should be justified.
- 12.** The requirement of the instruments/drugs/other equipment necessary for scheduled surgical list should be discussed among surgeon, staff nurse and the anaesthesiologist a day prior to planned OR list.
- 13.** The non-availability of the surgeon should be informed in time so that another case is substituted in that slot.

- 14.** All patients who have met PACU discharge criteria must be discharged promptly to prevent delay in shifting out of the operated patient.
- 15.** Day care patients should be counseled adequately to report on time. Computerized scheduling should be utilized to create a realistic elective schedule.
- 16.** Audit should be carried out at regular intervals to find out the effective functioning of the OR

CONCLUSION

Operation theatre is an important part of the hospital system. It is the highest revenue generating unit as well.

The proper management and efficient working of the OT is hence highly essential. Scheduling of patients for surgery is an integral part of the management. The study has shown the number of cancellation cases planned and number of surgeries done in the same day. The unnecessary booking of the patients not only cause the wastage of resources but also the delays in other surgeries. Due to the scheduling of these patients, the other patients are deprived of the OT availability, surgeon's time and a high delay in their surgeries.

It should be the duty of the management to look into this area and frame a proper scheduling model to decrease patient's waiting time. The financial clearance is seen as one of the important reason behind it. There should be a proper planning for these kinds of patients.

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**STUDY ON THE UTILISATION OF THE OPERATION WEST
WING OT, MAX HOSPITAL, SAKET**

19TH APRIL TO 30TH APRIL, 2016

AT

MAX SUPERSPECIALITY HOSPITAL, SAKET



**Institute of Health Management Research,
Jaipur**

DECLARATION

I would like to state that I am the student of IIHMR university, Jaipur, batch (2015-2017 of the course hospital and the healthcare management. I do hereby declare that I am a student of 1st year, MBA in Hospital and Healthcare Management, IIHMR University, Jaipur, Rajasthan session 2015-2017.

I would like to state that I have carried out my Internship on the topic "Study on the Utilisation of the operation theatre, west wing OT, Max Hospital Saket under the guidance of Dr. Sandeep More, DMS (Deputy Medical Superintendent) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfilment for the degree of MBA in Hospital and Healthcare Administration.

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

Dr. Akanksha Mamgain

IIHMR University

(2015-2017)

INTRODUCTION

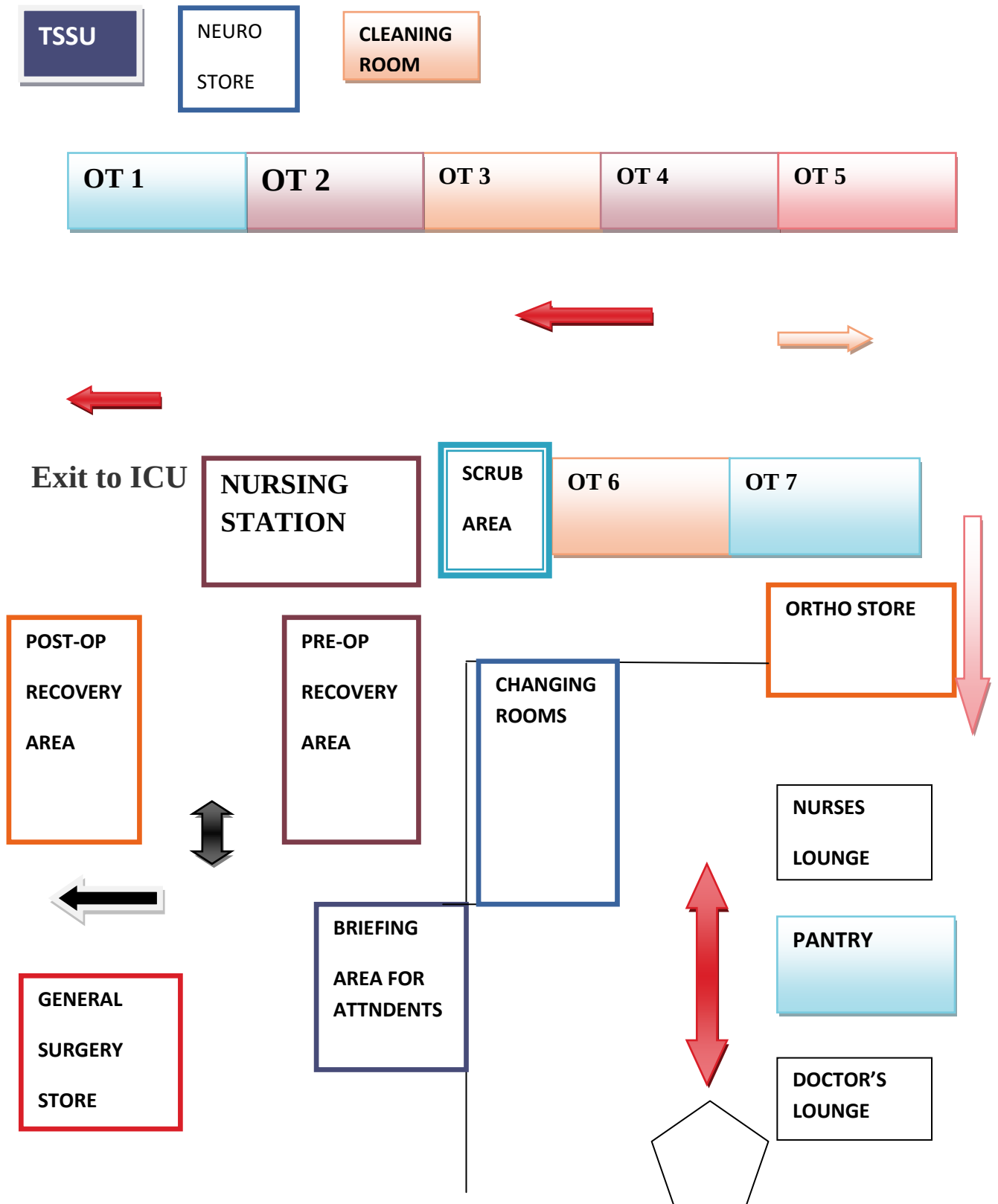
The surgical suite typically consumes 9-10% of the hospital budget. Surgical suites once needed only 20% utilization to produce a positive bottom line. However, economics of the OR environment have changed dramatically in the past 25 years. Technological advances like minimally invasive surgery which need costly equipment, payments based on diagnosis related groups, captivated payment and discounted fee-for service have all significantly reduced margins in the surgical business. It is therefore, not surprising that this area is earmarked by many hospitals as a place to reduce expenses. All of us who work in the OR must be cost efficient and must maximize productivity for long-term success. Achieving these goals requires reliable data to help various stakeholders, chief executive officer, chief financial officer, nurses, surgeons and anesthesiologists-all have to align what sometimes appear as disparate goals. We need to examine traditional OR management practices. Traditional utilization measurements that look only at the time patients are in the OR reward surgeons for occupying OR's but do not address cost efficiency or productivity. One measure of how well an OR functions is the "utilization".

OR utilization is defined by Donham and colleagues as the quotient of hours of OR time actually used during elective resource hours and the total number of elective resource hours available for use. Optimum utilization of the OT time has always been a priority area for Hospital Administrator's. Baker had opened that accurate records, weekly analysis of recorded data, establishment of operating room rules and regulations and strict adherence to and enforcement of approved policies and procedures are essential ingredients for an efficient operating of an operating room. Thus it is clear that study of operating room records can provide means of assessment of the degree of utilization of operation theatres

The key elements in the efficient use of operating theatres are: effective management and good communication, trained staff, appropriate facilities, equipment, and operational layout. The operation theatre complex, west wing, at Max Hospital Saket is located at the first floor. There are 7 operating rooms in the complex. The timings for the functioning of the OT is 8.00 a.m in the morning to 8.00 p.m at evening. The 720 mins of time is available daily for

the effective functioning of the OT. There are many major surgeries done in the OT everyday. These include Orthopaedic surgeries, Robotic surgeries, neurosurgeries, kidney transplants, cholecystectomy, laparoscopy, hysteroscopy etc. The surgeries include major to minor, short duration and long duration surgeries. The OT is open 24*7 in case of an emergency case to be taken care of. The contribution of the OT in the revenue generation is major and so are important the management of its resources and effective utilisation.

**OPERATION THEATRE COMPLEX, MAX
HOSPITAL, SAKET**



REVIEW OF LITERATURE

Operation Theatre complex is an important profit making unit of clinical hospital operations. The OT Complex includes mainly three areas apart from other supporting areas-Operation rooms/ theatres.Pre-operative recovery area and post-operative recovery area. The concept of Zoning is followed in construction of OT Complex. The number of operation-rooms depends upon the size & type of hospital.OT complex is located in central part of hospital building from ground floor to various floors of Hospital. This special unit is capital intensive part of hospital as heavy investment is required to build it and to purchase the fixed and movable equipment. Heavy fixed and variable cost is incurred to run this unit. So, it makes utilization of this unit mandatory not only to increase revenues but also to curtail the cost and keep it within control. Utilization studies are conducted by hospitals especially by secondary and tertiary care hospitals in order to achieve two purposes-to increase revenue and to reduce cost to optimize profits and save losses.

Academic Literature on utilization of OT complex is lacking in Africa & Indian Sub-continent. Improved theatre utilization would lead to a reduction in cost recovery from each patient. In one of the study in africa it was concluded that private OT utilization rates were higher than public Operation theatres due to commercial nature of private healthcare and absent consequent cost drivers in public healthcare sector. In Africa, the 48% utilization in OTs observed was significantly lower than the global benchmark of between 70-80% (Hartmann and Sunjka, 2013). Peter, A. (2013) described about the scenario of OT Complex in New South Wales. He described Utilization indicators as Start time accuracy, case Time effectiveness, Room utilization, Quality & Safety and last Scheduling.

In a simulation study in USA to define optimum utilization in OR, it was concluded that achieving utilization of 85% to 90% is highest that can be achieved. Factors which affect OT utilization are Overutilization/ underutilization, Case duration (Short cases are easier to accommodate than longer duration cases) and variability of case duration (Tyler, et. al., 2003). In an Indian research paper published in International conference proceedings, Outcome measurement showed an increase of 11% in OT utilization by internal marketing strategy (Somu, 2012). Recommendations by a Scottish project report on OT utilization includes -Robust Management Information on theatre utilization is needed to plan and monitor activity effectively, the utilization of individual theatre sessions must be reviewed regularly to obtain full potential (TheAccounts Commission report, 1999). Vinukondaiah, ET.

al., 2000, concluded that the delay in starting lists, under scheduling, interruption due to emergency surgeries, administrative reasons, induction of anaesthesia and recovery policies are the main factors that account for inefficient use of operating facilities in Indian hospitals. Efficiency in OTs depends upon a good system of planning and scheduling including emergencies at a reasonable time (Association of Anaesthetists of Great Britain and Ireland (2003)).

RATIONALE

This study is indented to analyze the OT utilisation of the West Wing operation theatre complex. This study will help us understand the areas of improvement. The study will analyze the Utilisation of each and every operating room in the complex. It will examine, which complex is underutilized and need a proper management strategy to get effective utilisation from it. The effective utilisation of OT is essential for the hospital and hence a study on utilisation will provide an overview about the effective working of the operation theatre.

OBJECTIVES

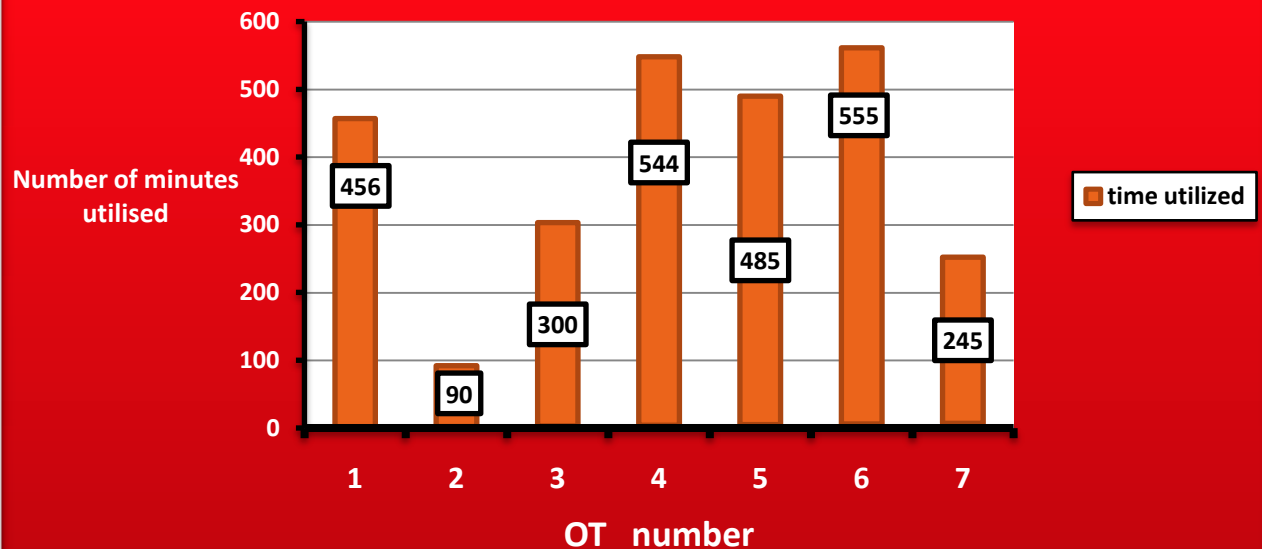
- To study the process flow of the operating theatre complex.
- To find the time utilisation at each end and to find the bottlenecks.
- To examine the utilisation of each OT.
- To analyse the underutilisation and areas of improvement.

METHODOLOGY

- **Type of study** : Observational cross-sectional
- **Study population** : In Patients from 19th April, 2016 to 30th April, 2016 at Max Super Speciality Hospital, Saket, Delhi
- **Study area** :Operation theatre complex, West wing, Max Hospital ,Saket, Delhi
- **Duration of Study** – 10 days
- **Type of Data** - Quantitative
- **Technique** – Direct observation and collection of data from the registers and OT manuals.
- **Sample size** – **197 cases from 19th April, 2016 to 30th April, 2016**
- **Sampling technique**- probability sampling
- **Inclusion criteria**- all surgery cases done in west wing,operation theatre complex from 19/4/16 TO 30/4/16
- .
- **Data collection** - Quantitative (10 days)
- **Data entry**- Manually
- **Data Analysis**- Using bar charts, pie charts

DATA ANALYSIS

West block OT utilisation in minutes (19/4/16)

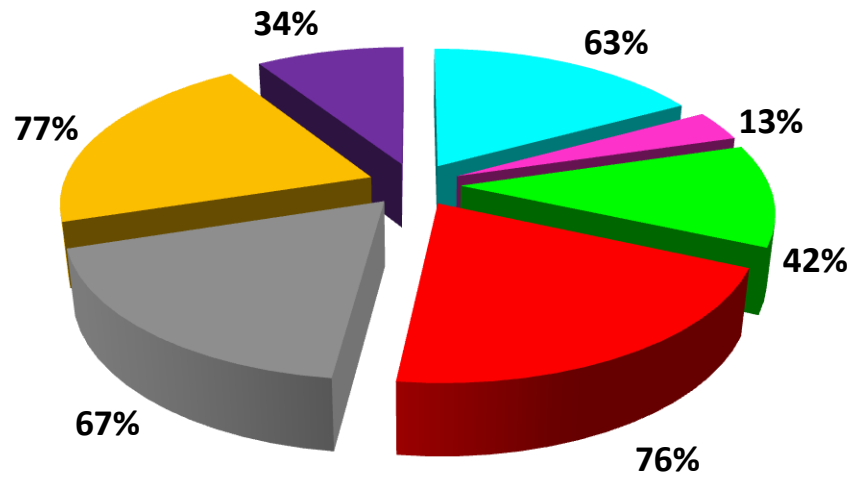


INTERPRETATION

It is seen that on 19/4/16 the OT 6 has maximum utilisation of 555 minutes. It is followed by OT 4, OT 1 with the utilization of 544 minutes and 456 minutes respectively.

The least utilization is shown by OT 2 as 90 minutes.

Percentage utilization of OT(19/4/16)

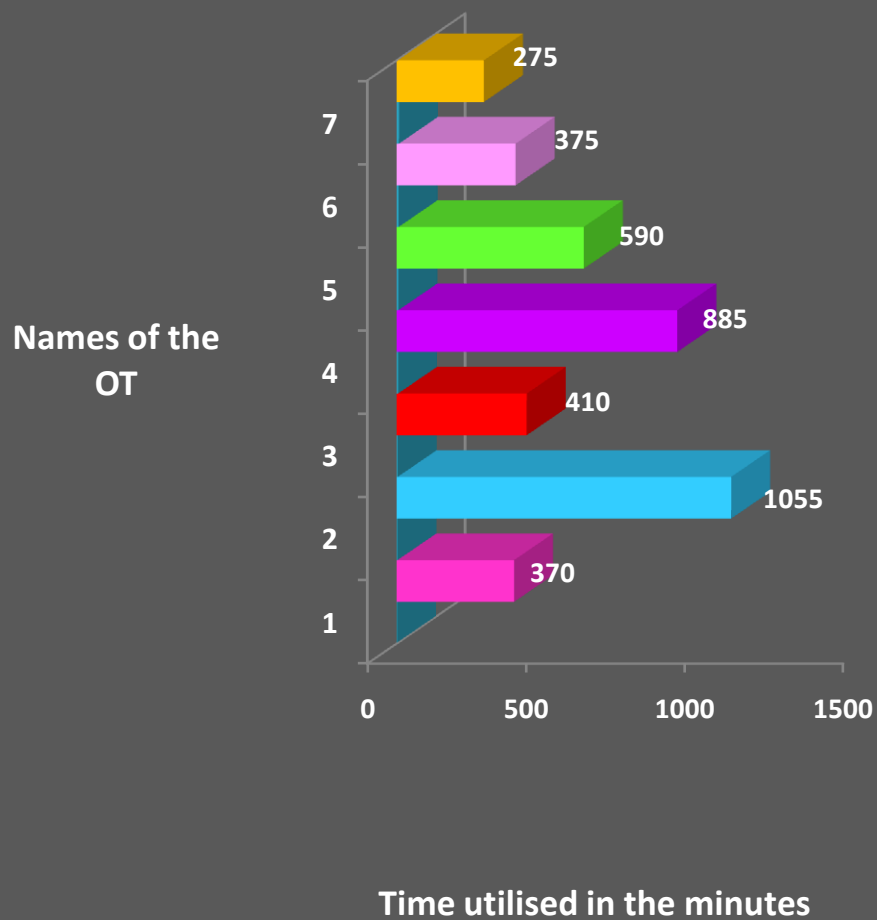


INTERPRETATION

It is seen that on 19/4/16 the OT 6 has maximum utilisation of 555 minutes. It is followed by OT 4, OT 1 with the utilization of 544 minutes and 456 minutes respectively.

The least utilization is shown by OT 2 as 90 minutes.

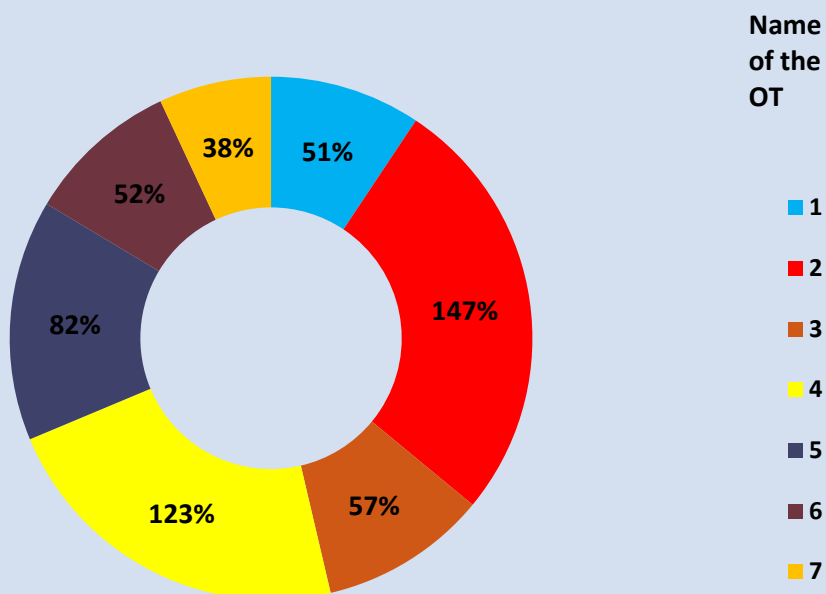
OT Utilisation in minutes (20/4/16)



INTERPRETATION

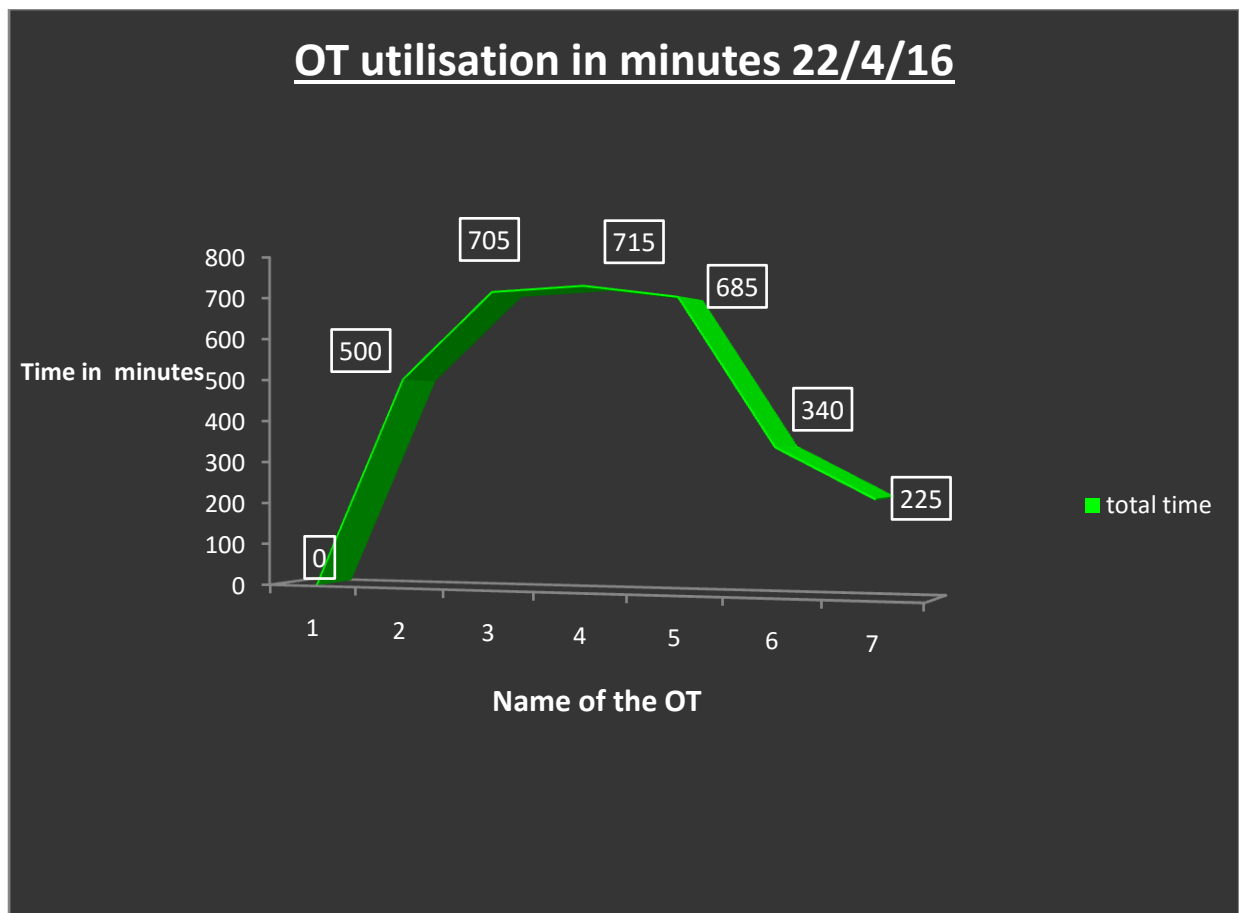
It is seen that maximum utilisation is associated with OT 2 as 1055 minutes.

The percentage OT utilisation 20/4/16



INTERPRETATION

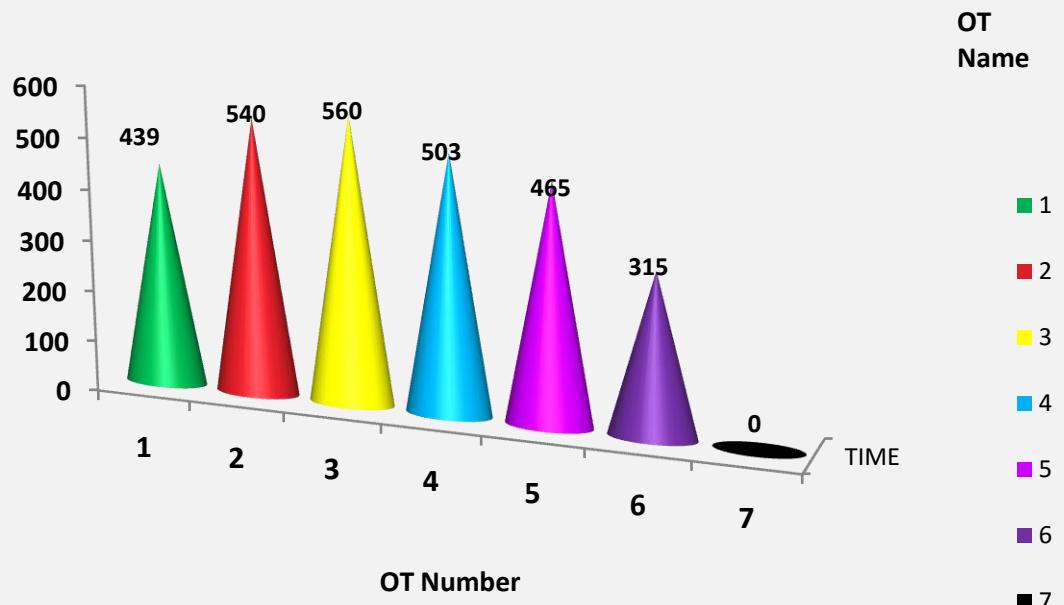
The OT 6 is showing overutilization of 147% and OT 4 is 123% utilised



INTERPRETATION

OT 4 shows maximum utilisation of 715 minutes.

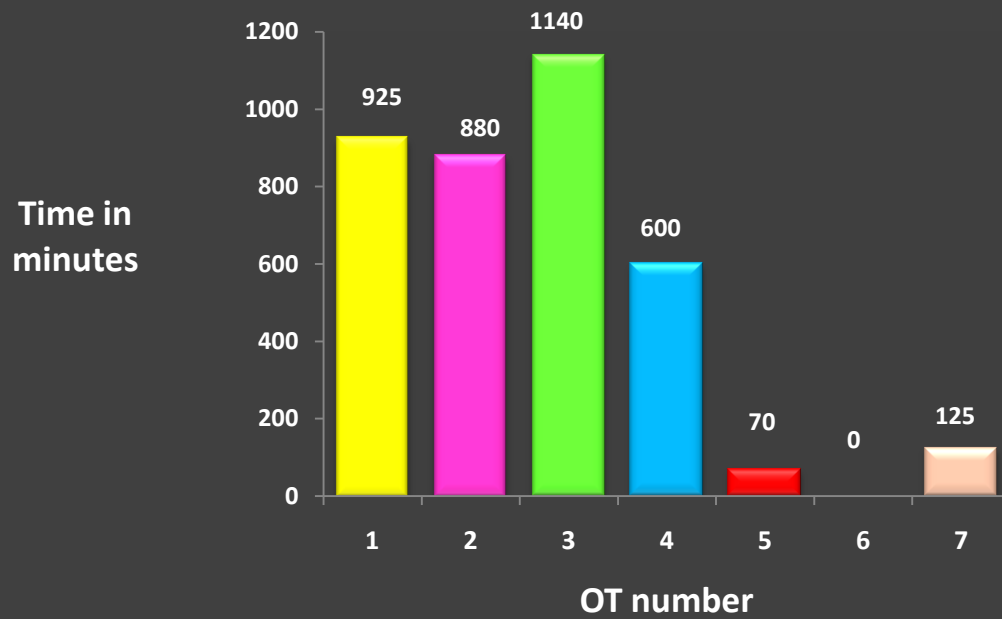
OT utilisation in minutes (23/4/16)



INTERPRETATION

It is seen that OT 3 and OT 2 shows maximum utilization of 540 minutes and 560 minutes respectively.

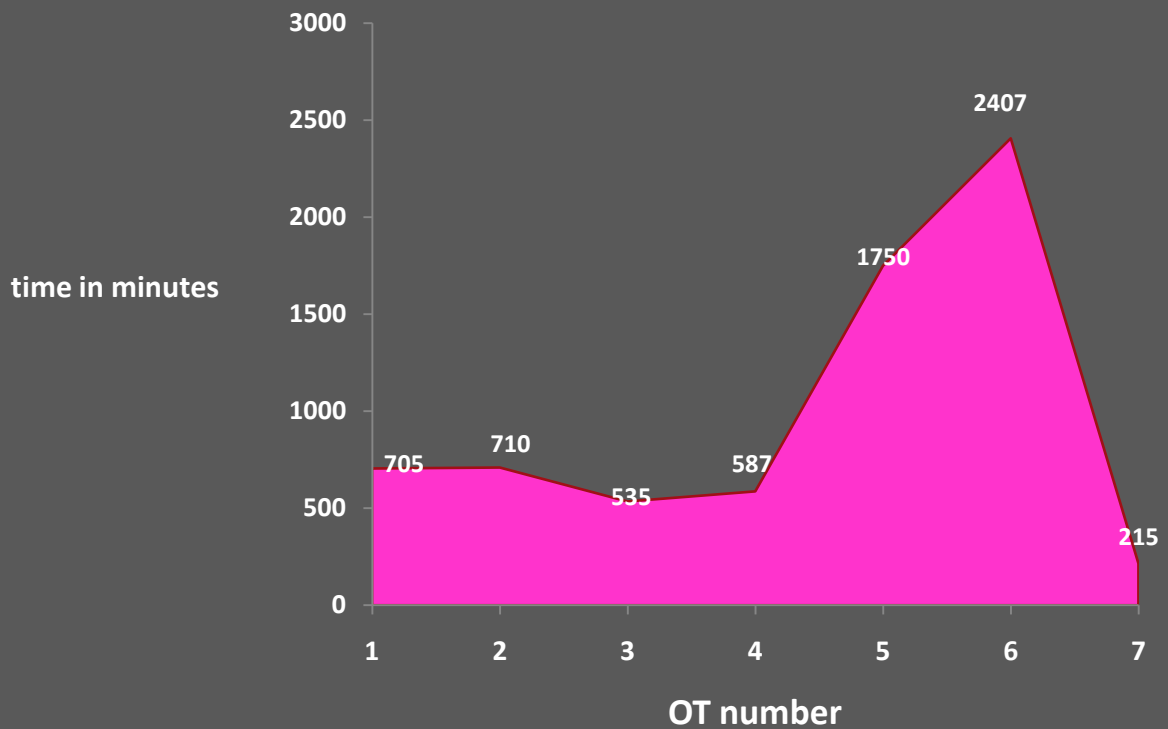
OT utilisation in minutes 25/4/16



INTERPRETATION

There is utilisation of 1140 mins seen in OT 3, whereas 925 mins OT utilization in OT 1.

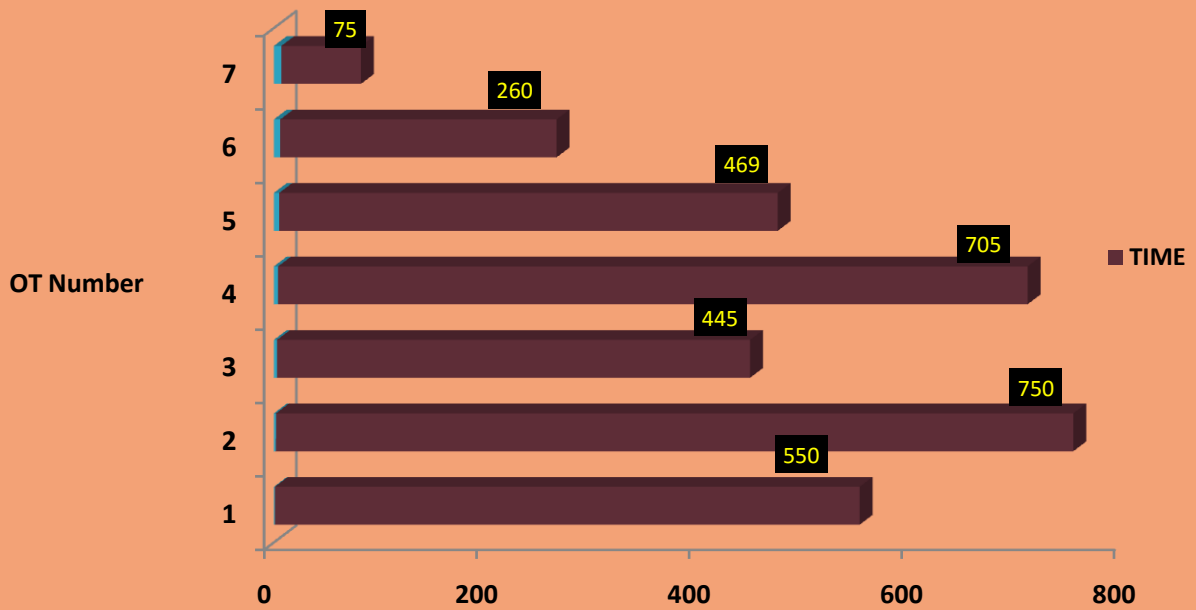
OT Utilisation in minutes 26/4/16



INTERPRETATION

The maximum utilisation was shown by OT 6 as 2407 minutes.

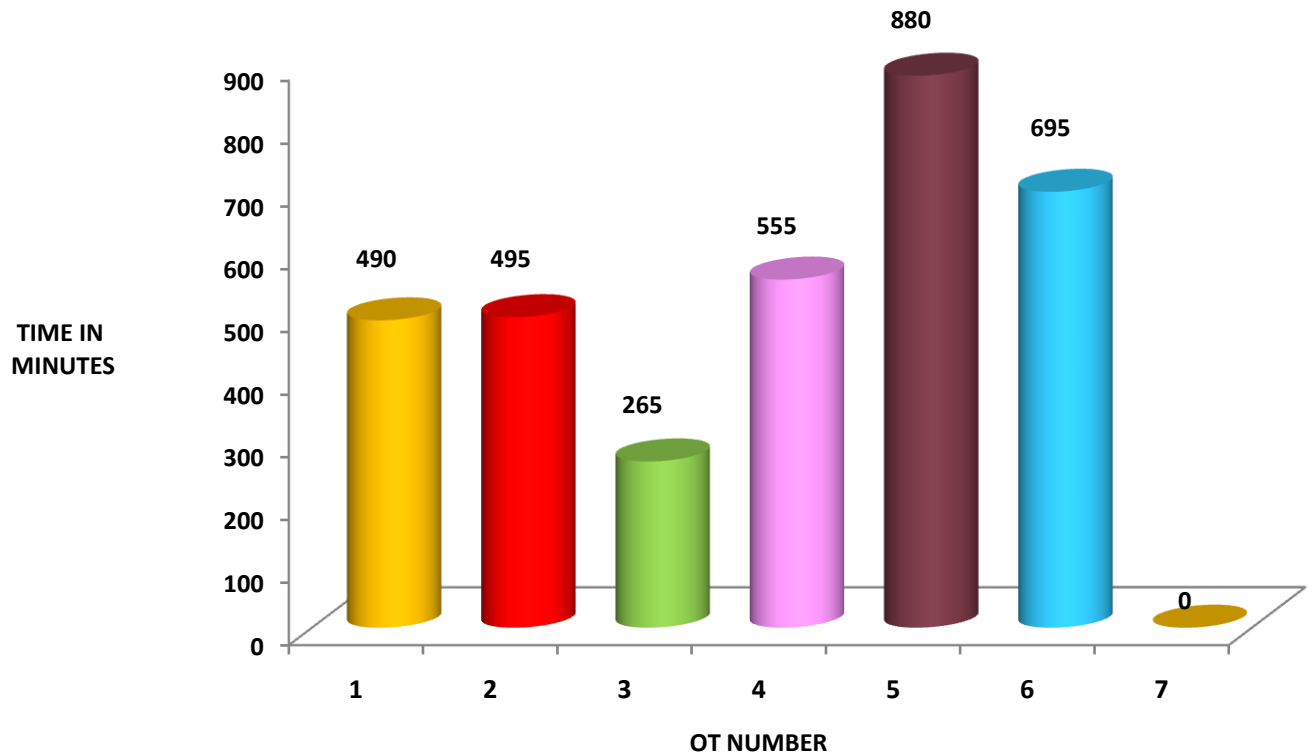
OT Utilisation in minutes(27/4/16)



INTERPRETATION

It is seen that the maximum utilisation is in OT 4 and it is 705 mins

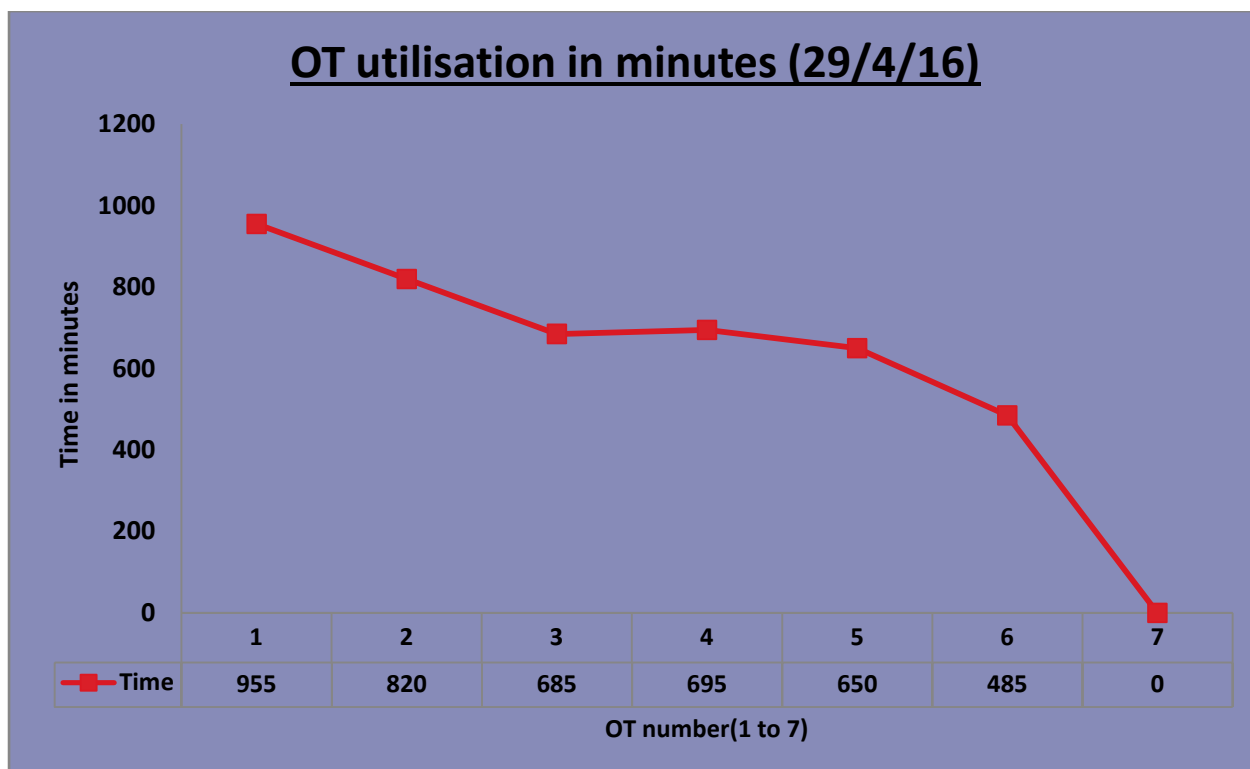
OT Utilisation in minutes(28/4/16)



INTERPRETATION

The highest utilization is seen in OT 1 as 955 mins.

On the other hand there was no utilisation of OT 7 on the similar day.

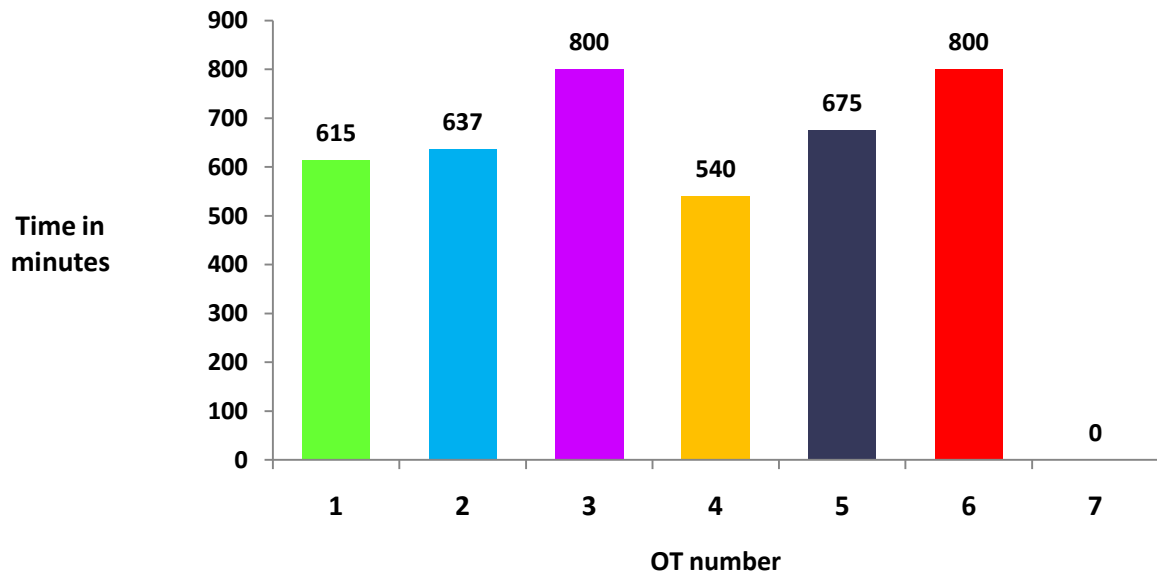


INTERPRETATION

The highest utilization is seen in OT 1 as 955 mins.

On the other hand there was no utilisation of OT 7 on the similar day.

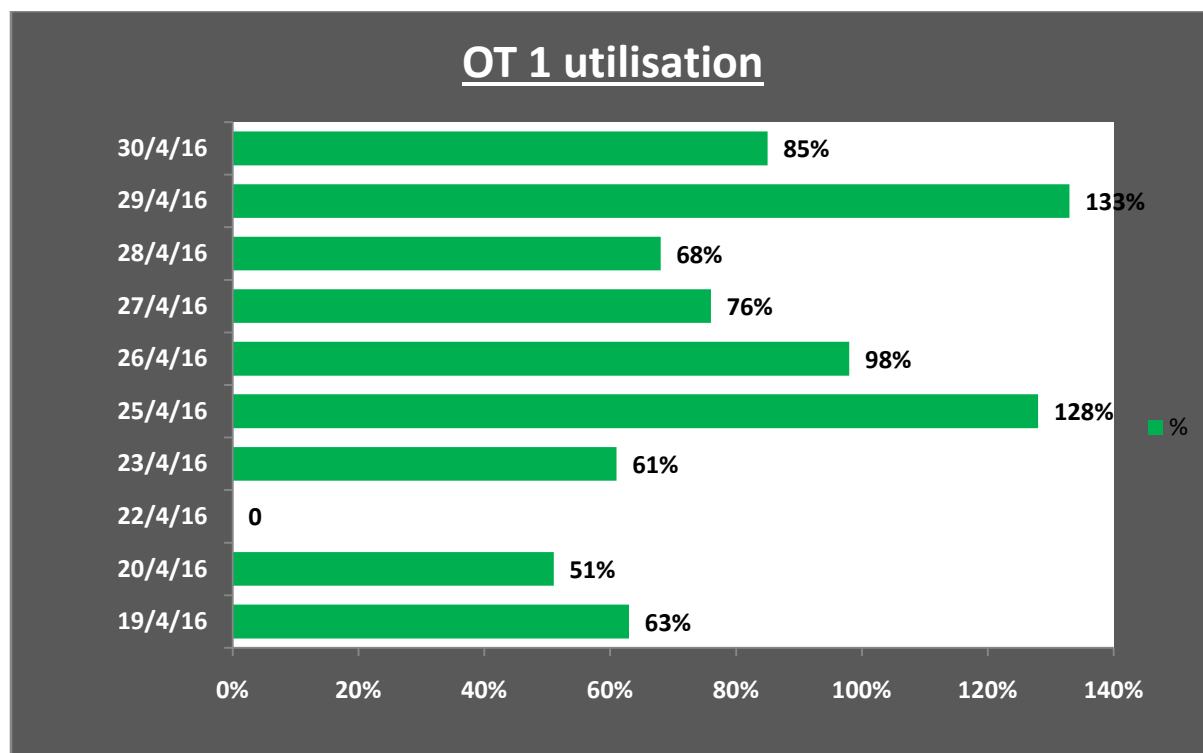
OT utilisation in minutes(30/4/16)



INTERPRETATION

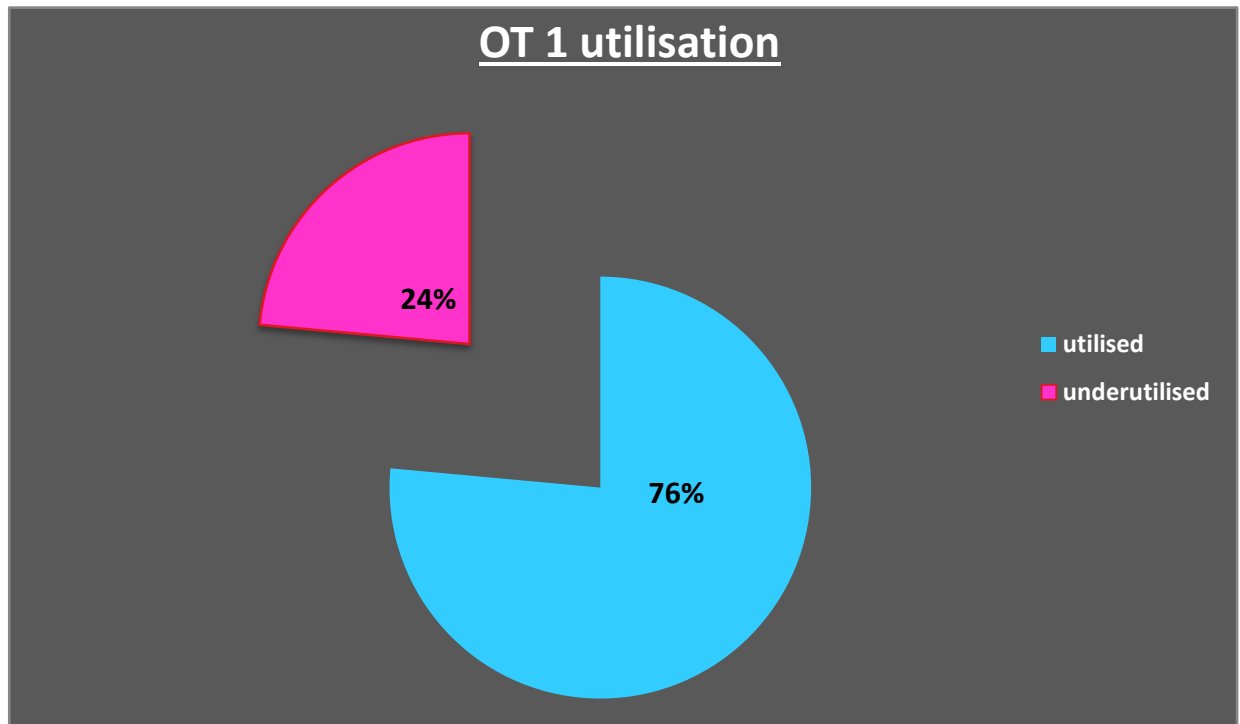
It is seen that the maximum OT utilisation is 800 mins in OT 6 and OT 3.

There was no utilization seen in the OT 7.



INTERPRETATION

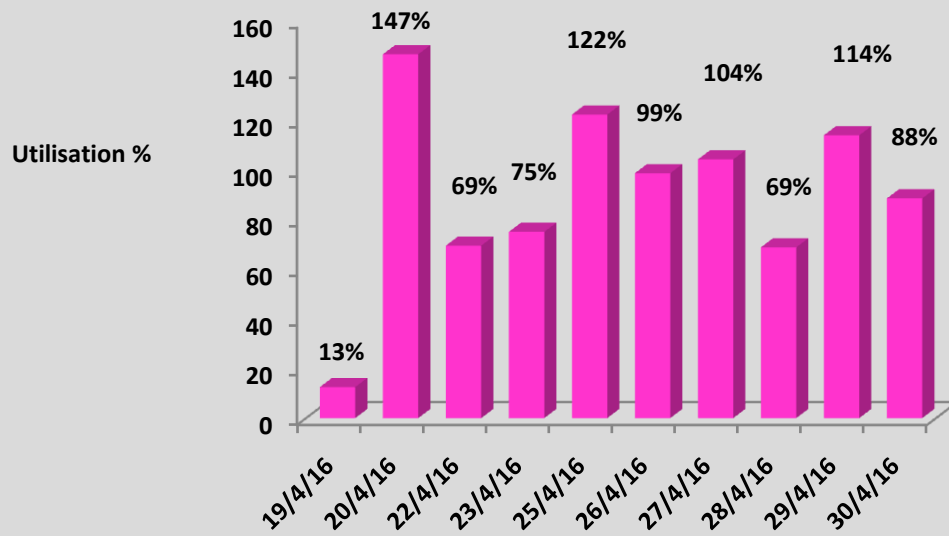
The maximum utilisation is seen as 133% followed by 128% on 29th and 25th April. The minimum utilisation is 0 and is recorded on 22nd April.



INTERPRETATION

It is seen that OT 1 is 24% underutilised.

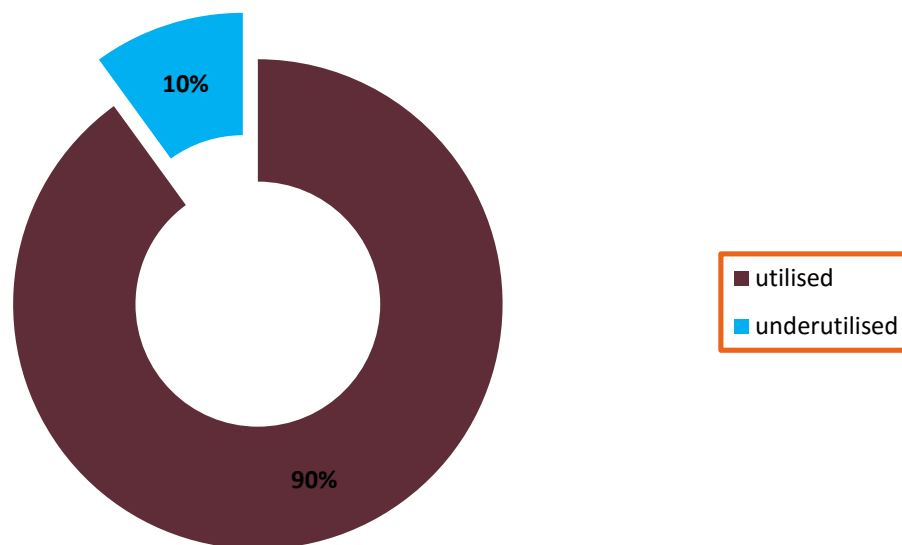
OT 2 utilisation



INTERPRETATION

The maximum OT 2 utilisation was on 20/4/16 as 147 %.

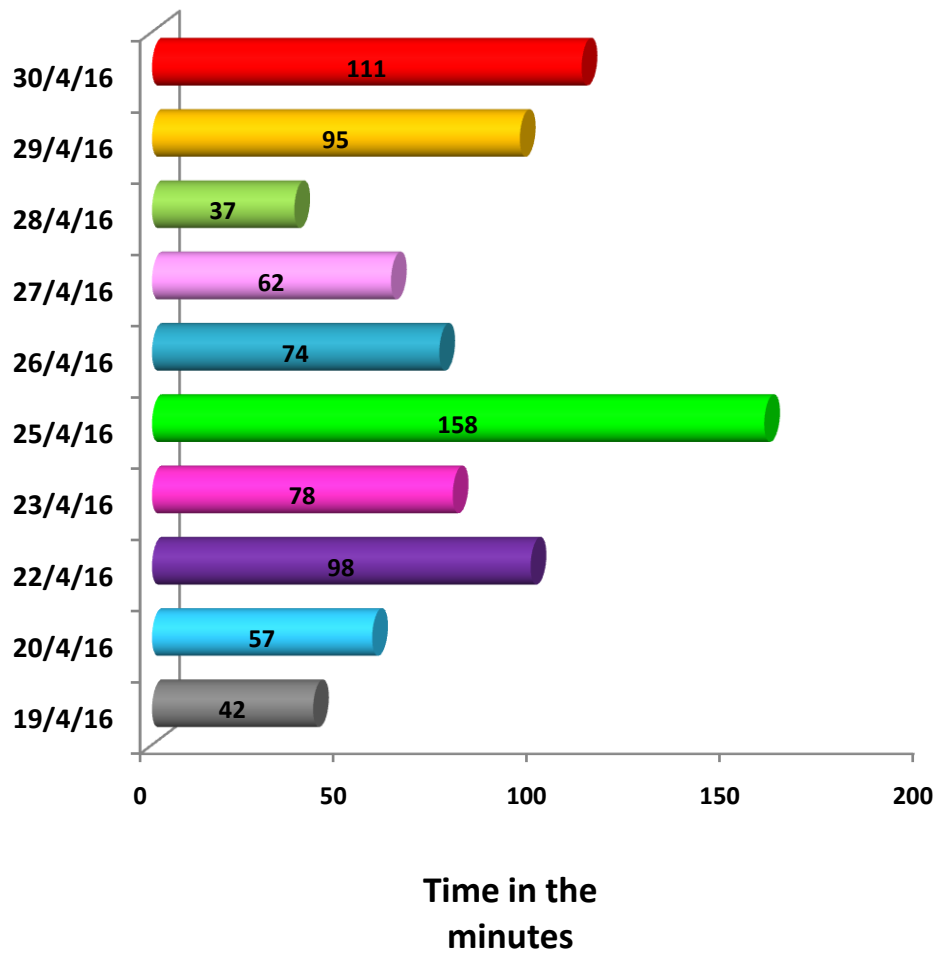
The OT 2 utilisation



INTERPRETATION

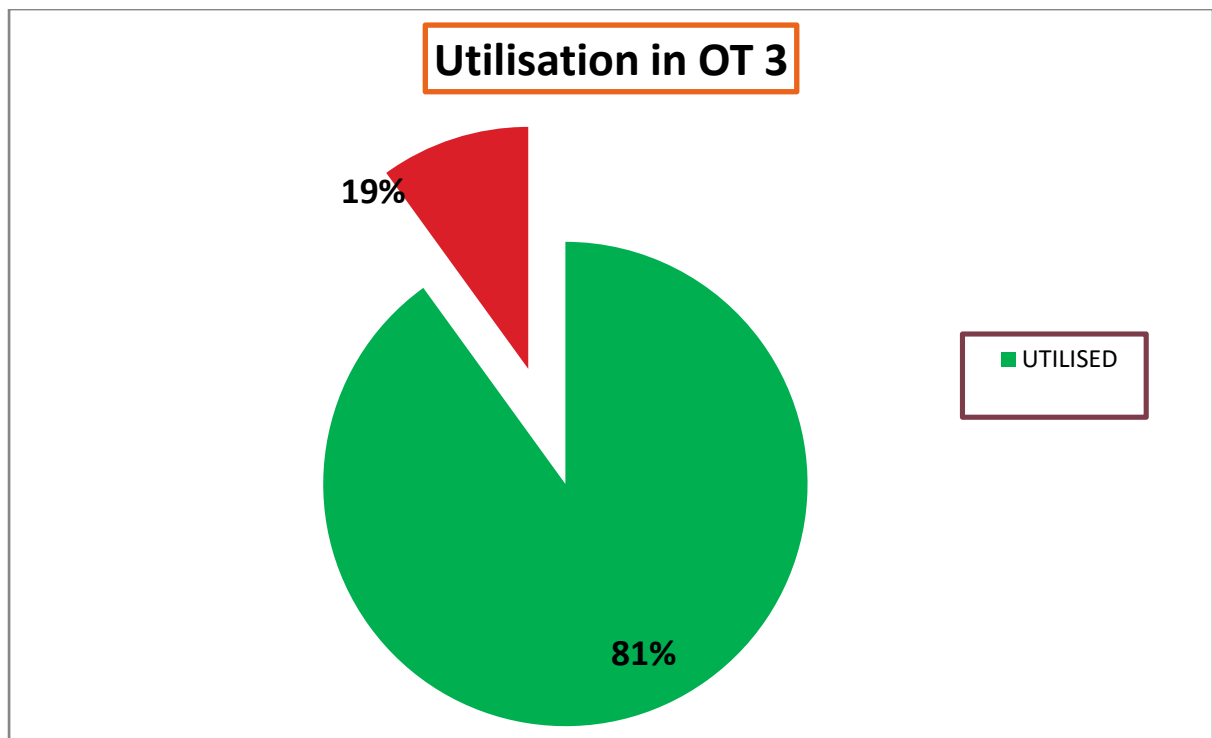
There was 90% utilisation of OT 2 and 10% underutilisation.

Utilisation OT 3



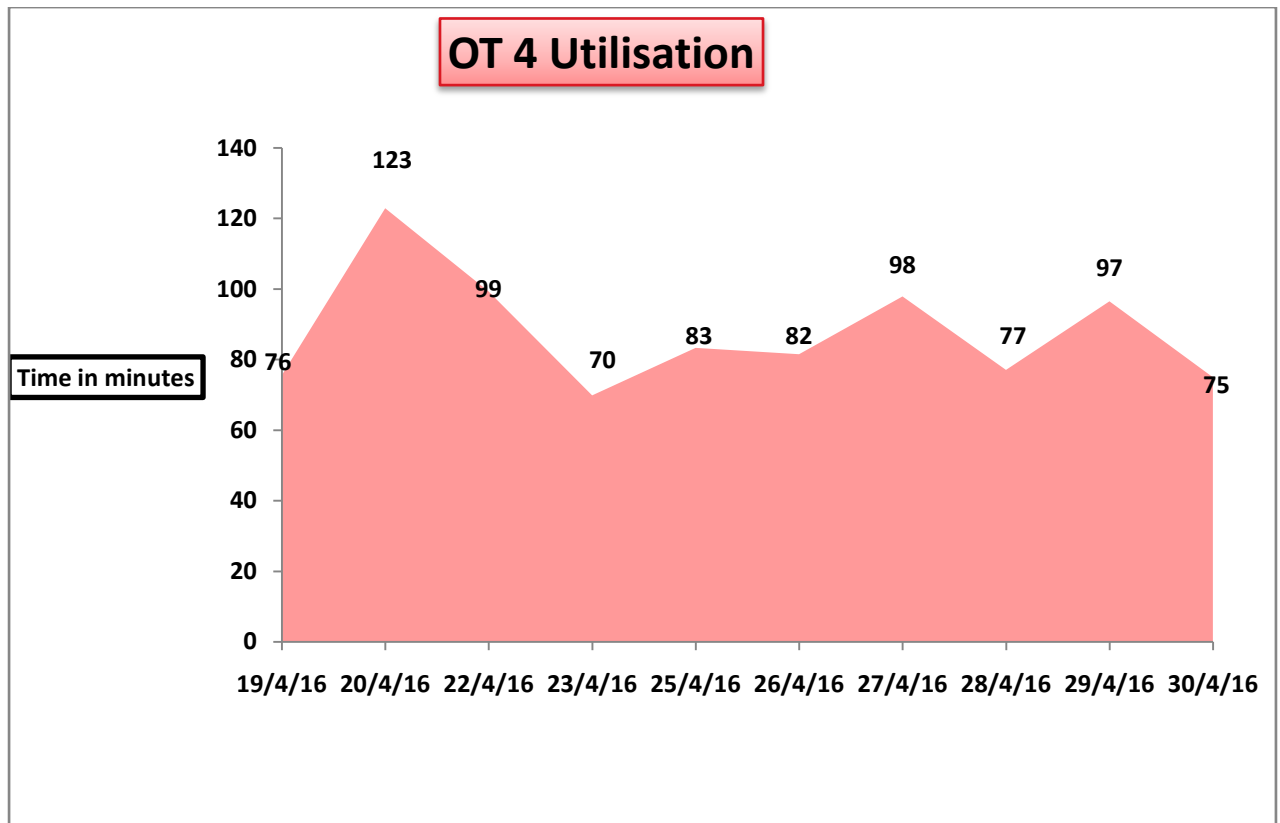
INTERPRETATION

The maximum OT utilisation was seen as 158 minutes on 26/4/16.



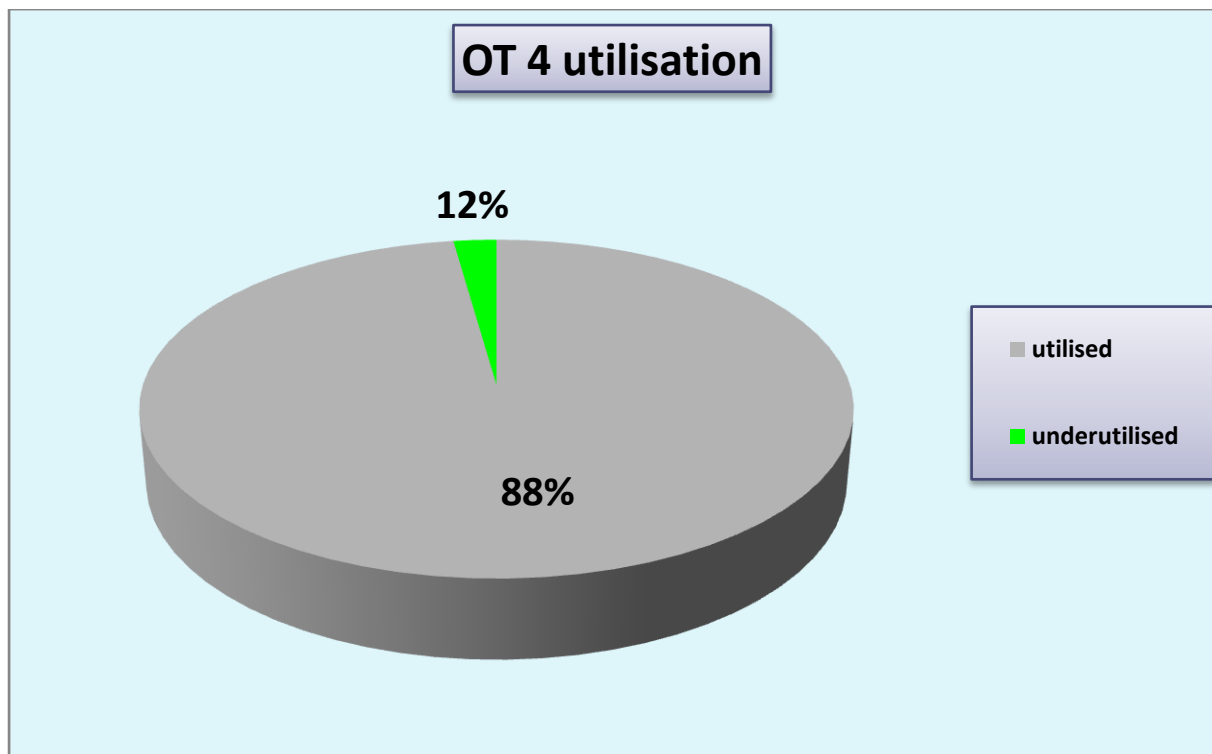
INTERPRETATION

OT 3 is 19% underutilised.



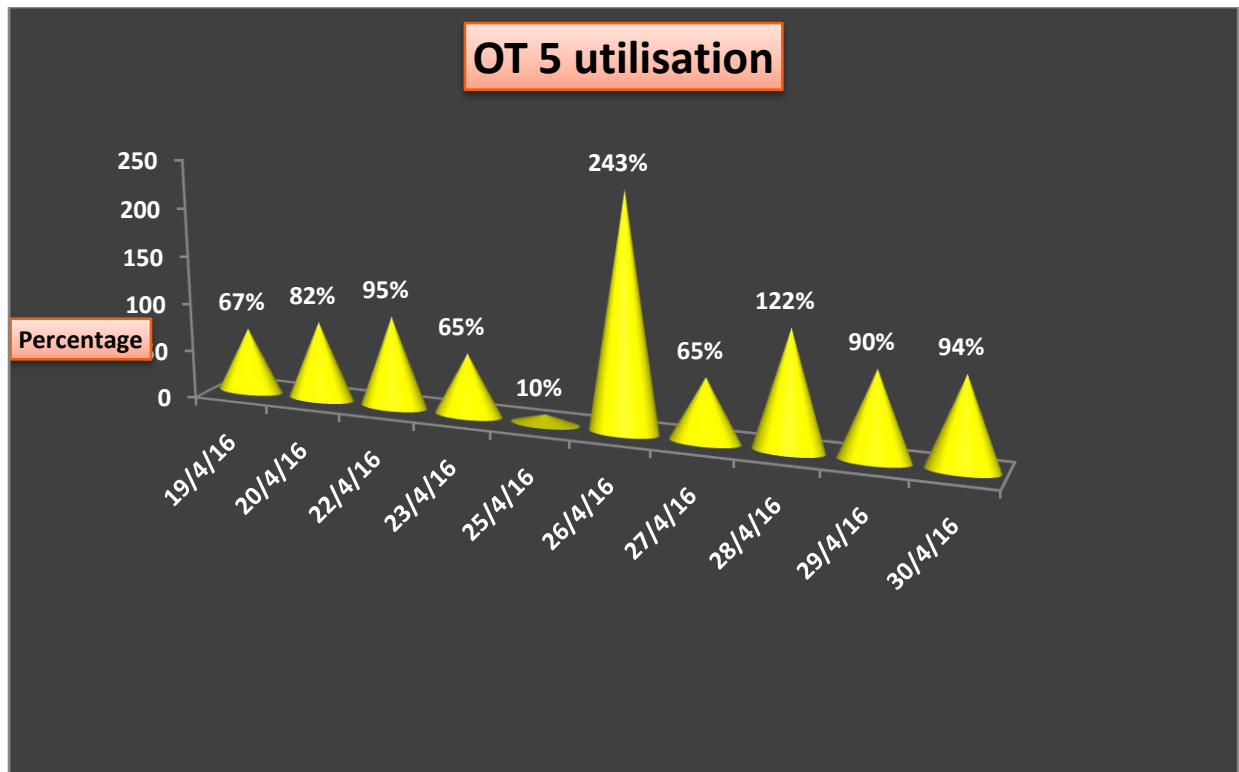
INTERPRETATION

OT 4 has showm maximum utilisation of 123 minutes on 20/4/16.



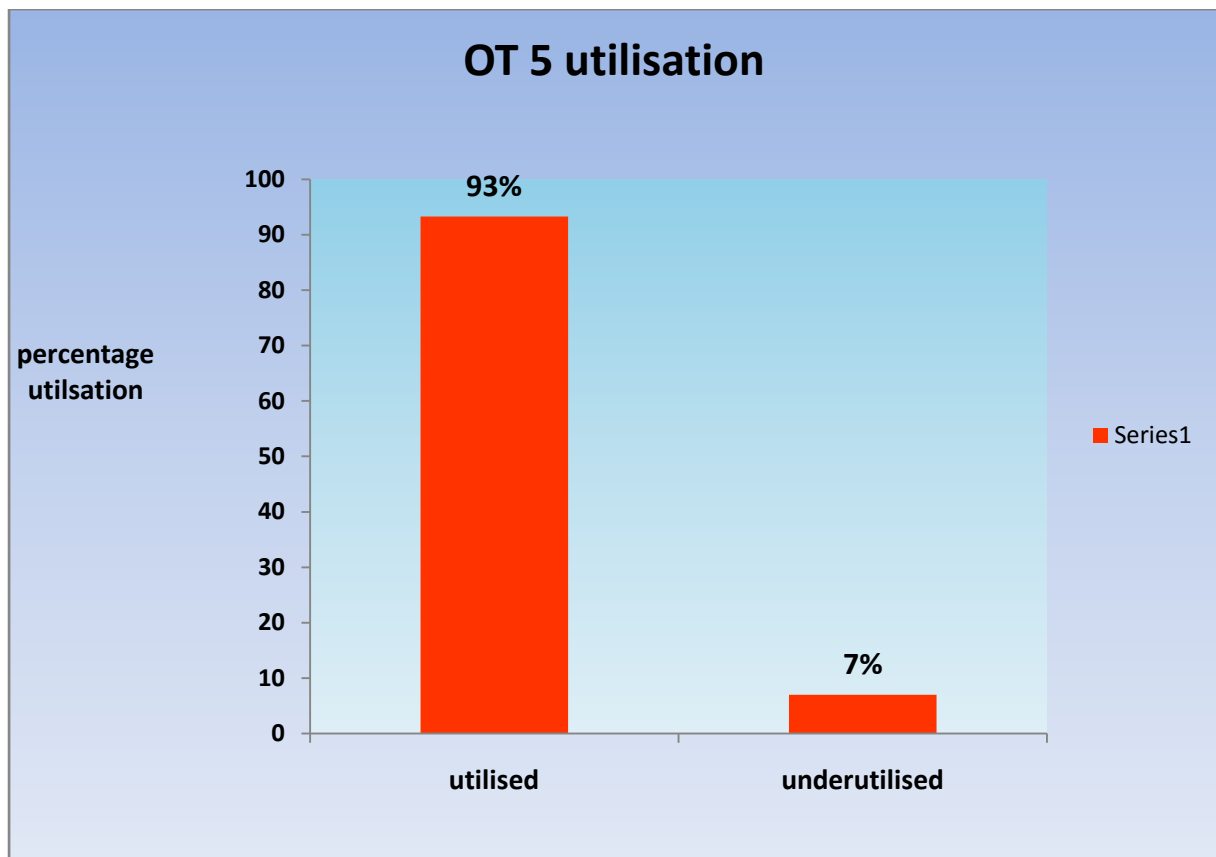
INTERPRETATION

It is seen that OT 4 is 88% utilised and 12% underutilised.



INTERPRETATION

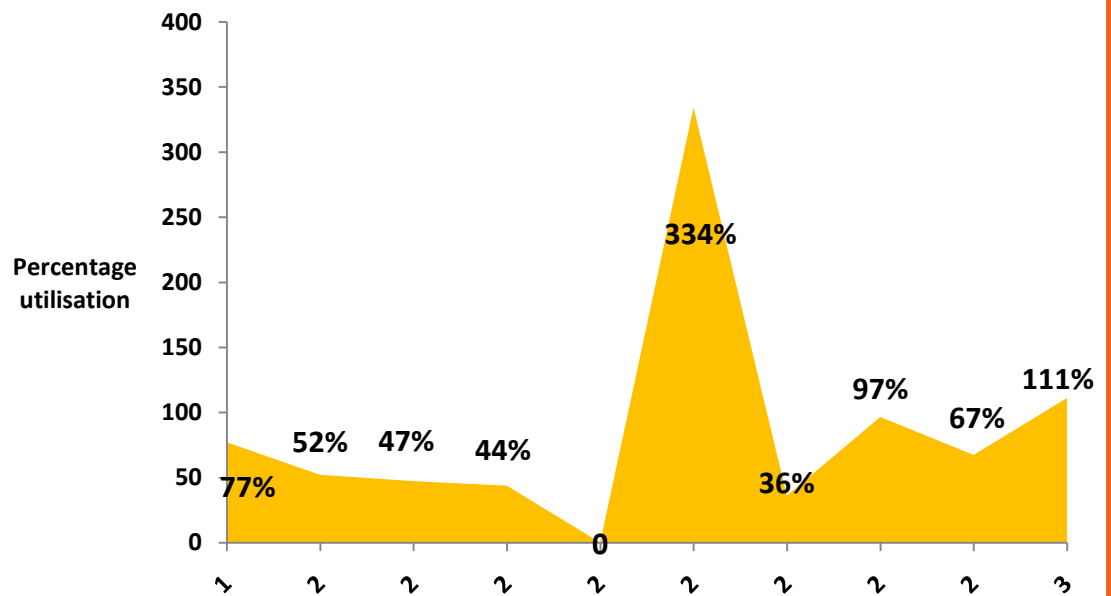
It is seen that maximum utilisation is shown by OT 5 on 26/4/16 and it was 243%.



INTERPRETATION

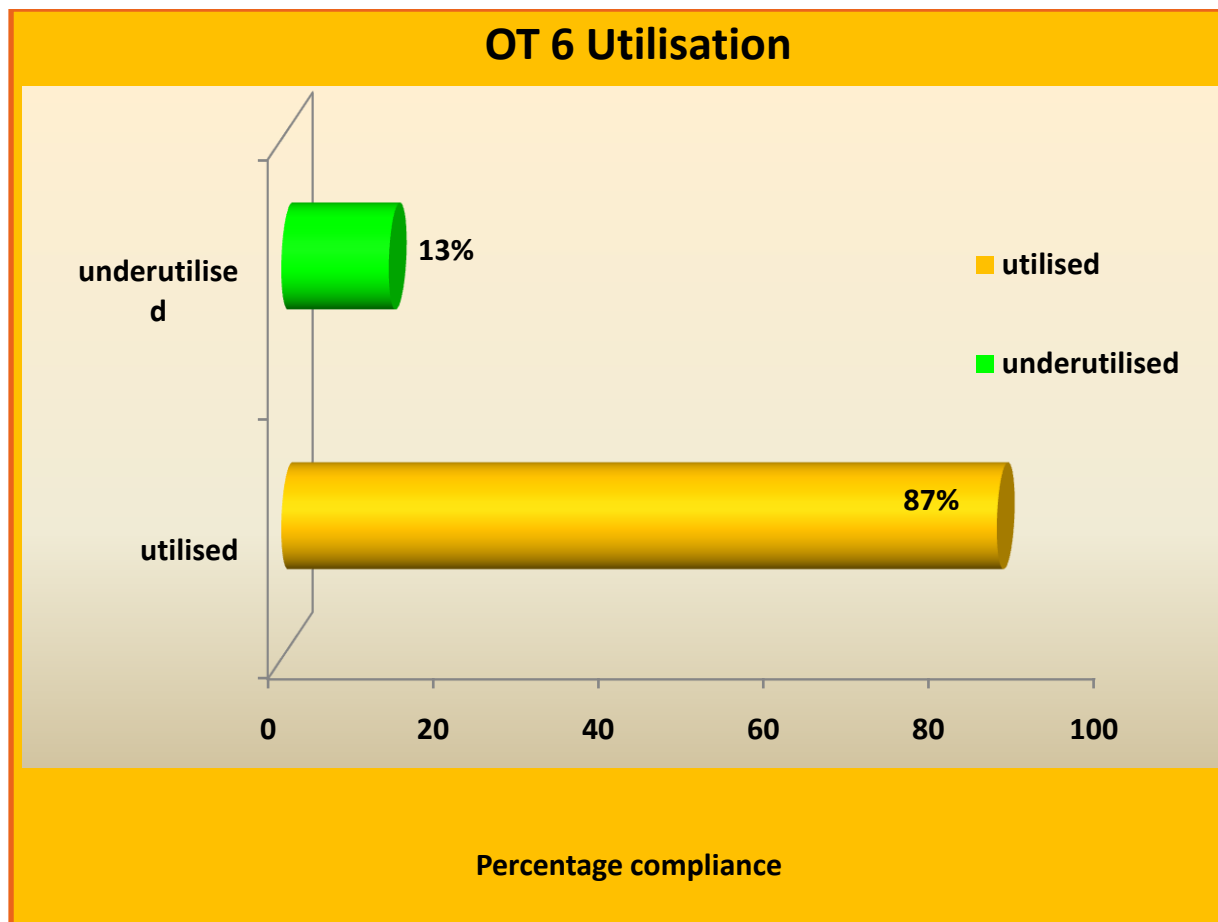
There was 93% utilisation of OT 5 whereas 7% underutilisation.

OT 6 utilisation



INTERPRETATION

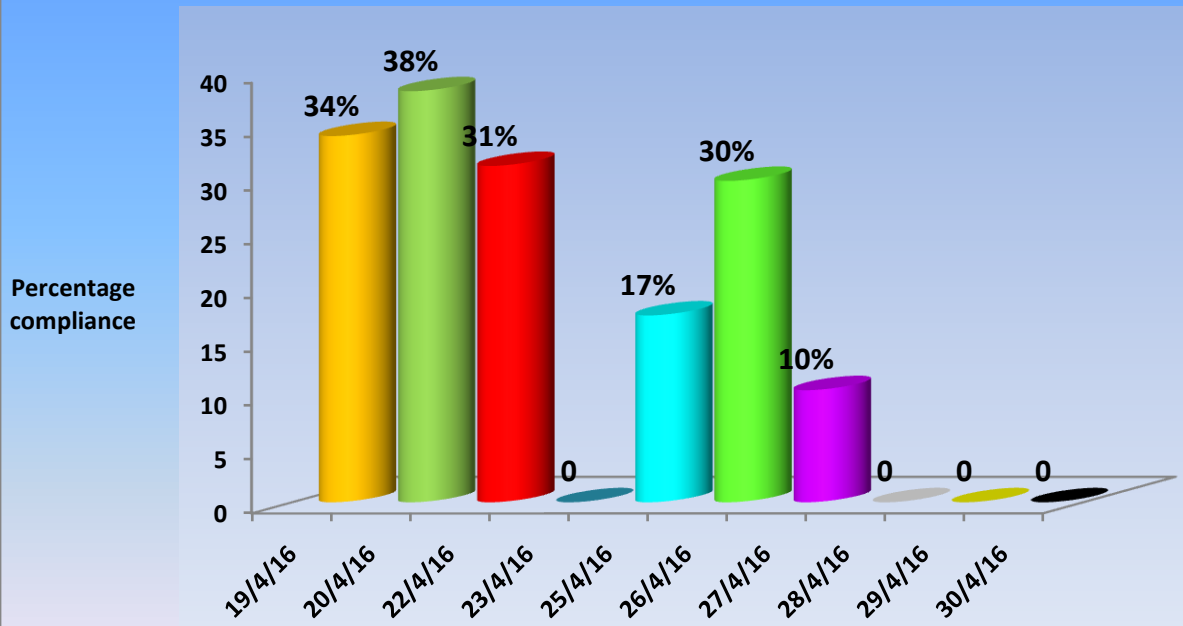
The data shows that maximum utilisation of OT 6 was on 26/4/16 and it was overutilised with 334% of utilisation.



INTERPRETATION

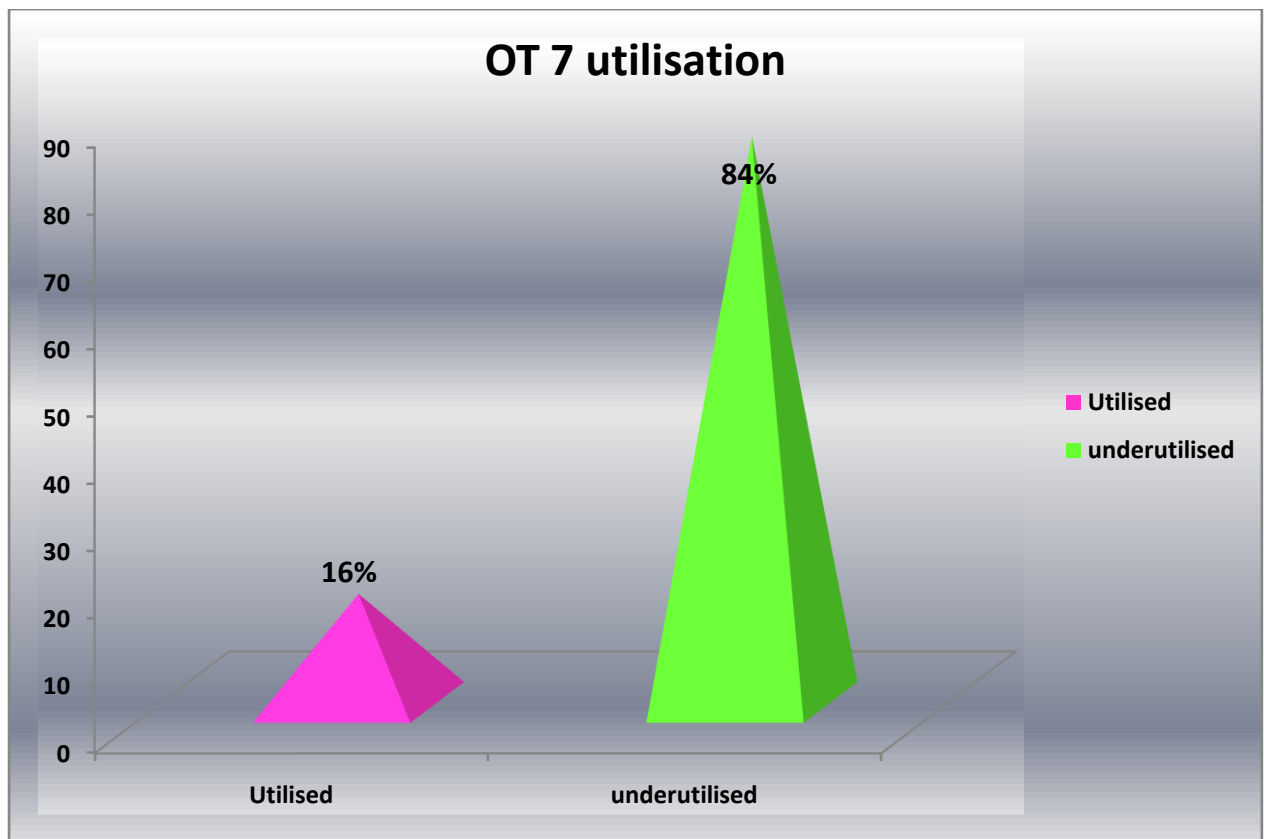
It is seen that OT 6 is 87% utilised and 13% underutilised.

OT 7 utilisation



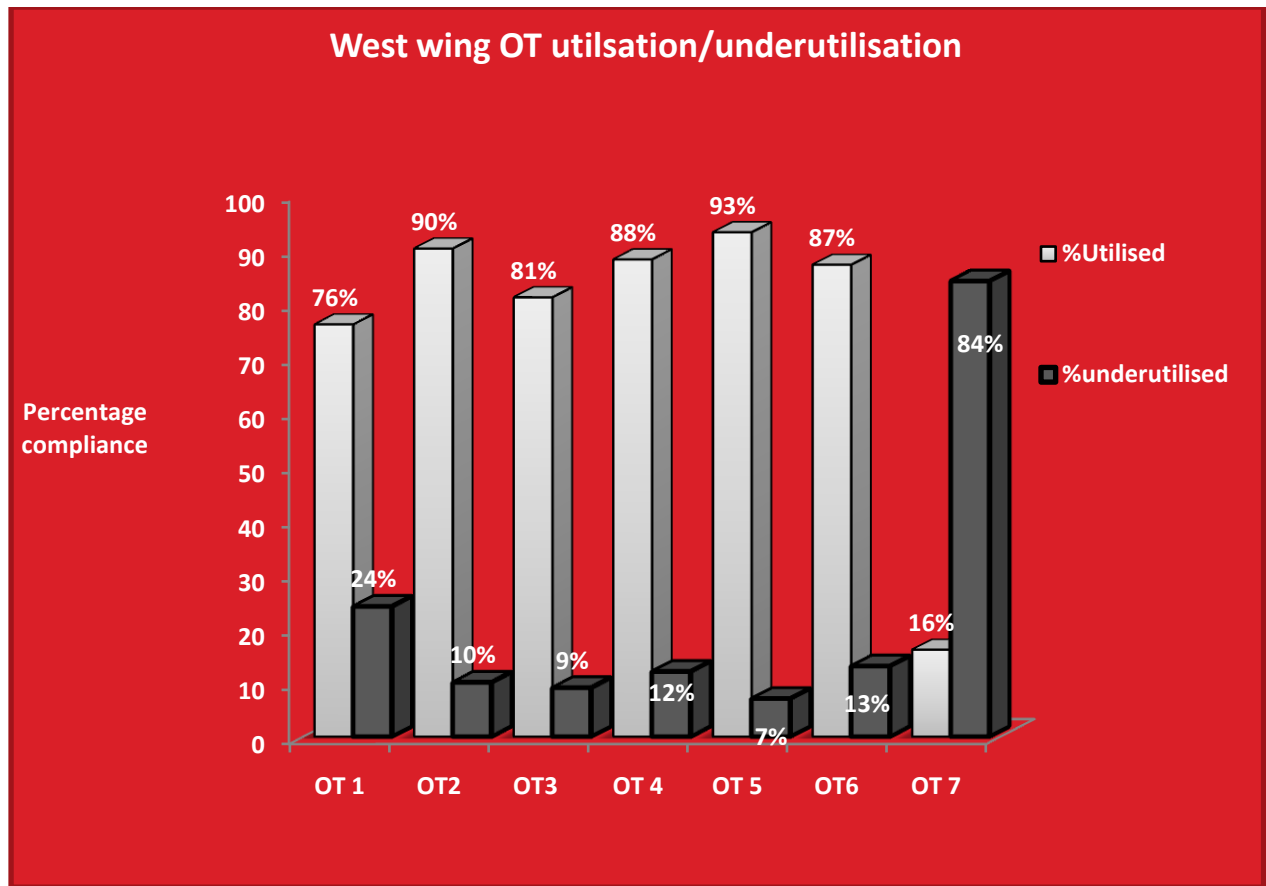
INTERPRETATION

It is seen that the OT 7 shows highest utilisation as 38% on 20/4/16, which is again below 50% utilisation.



INTERPRETATION

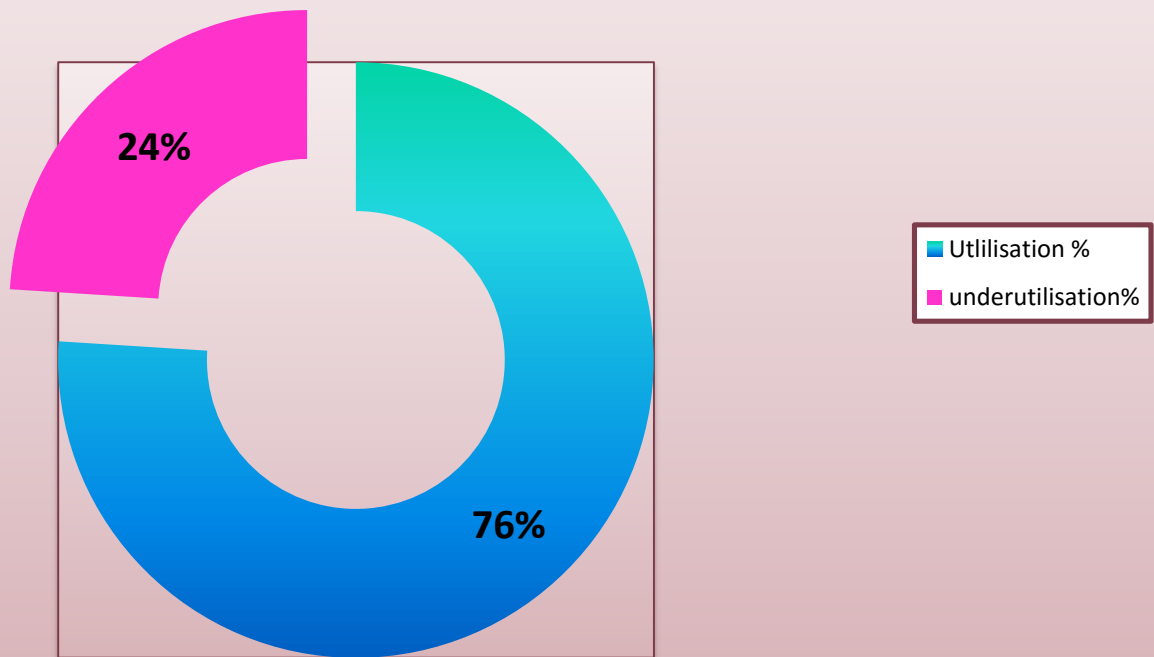
It is seen that OT 7 is 16 % utilised and 84% underutilised.



INTERPRETATION

The maximum underutilisation is shown by OT 7 and it is 84%.The maximum utilisation is shown by OT 5 as 93%.

West block OT utilisation



INTERPRETATION

It is seen that West Block Operation Theatre has 76% utilization and 24% underutilization.

OSERVATIONS AND FINDINGS

- **OT 1 has utilised 5505 minutes in 10 days out of the available 7200 minutes.**
- **OT 2 has shown the utilization of 6477 minutes whereas OT 3 as 5845 minutes.**
- **There was the utilisation of 6327 minutes in OT 4.**
- **The utilization in OT 5 is 6719 minutes.**
- **The utilization in OT 6 is 6232 minutes.**
- **There was an utilisation of 1160 minutes in the OT 7.**
- **OT 1 has 76% utilisation, 24% underutilisation.**
- **OT 2 has 90% utilisation and 10% utilisation.**
- **OT 3 has 81% utilisation and 9% underutilisation.**
- **OT 4 has 88% utilisation and 12% underutilisation.**
- **OT 5 has 93% utilisation and 7% underutilisation.**
- **OT 6 has 87% utilisation and 13% underutilisation.**
- **OT 7 has 16% utilisation and 84% underutilisation.**
- **It is seen that all the operation rooms are performing fairly well .OT 5 has maximum utilisation.**
- **The utilisation of the Brain Suit or OT 7 is remarkably very less aiond it shows 84% underutilization.**
- **The underutilization of OT 7 is effecting the overall utilization of Operation theatre complex West Block OT.**

RECOMMENDATIONS

- 1) There should be a policy document for operation theatre that should be reviewed regularly.**
- 2) First case should reach O.T. in time from the ward, to allow the O.T. to be started on time.**
- 3) The first case to be done in OT must be In-house so that delay because of late admission of
The patient in the hospital can be avoided.**
- 4) To insure the maximum efficiency, the ideal goal is to have neither underutilized nor overutilized OT time.**
- 5) Accurate Scheduling hence plays an important role; it requires the knowledge of the surgeon and anaesthetists average operating times for each procedure with and without any additional registrar trainee component.**
- 6) Unanticipated cancellation or elective surgery decreases operative theatre efficiency. Hence such cases should as less as possible or there should be a proper strategy to schedule such cases.**
- 7) The under-running operating time results in the under-utilisation of the total available, staff OT time and thus is both inefficient and costly. Thus OT management should closely monitor the under running time.**
- 8) Over run times frequently translates into overtime costs. Common reason behind it is an inadequate scheduling, late starts, cancellations and prolonged turnover times. A balanced approach to managing over runs is required to minimise unnecessary cancellations and poor utilisation.**
- 9) The brain suit which has a very less utilisation among all other OTs should take cases on specific days. Rest of the days, it can be utilised for other surgical procedures.**

10) The operating theatre showing overutilisation on specific Days should be monitored to find out the reasons behind it.

11) Hospital should consider making use of analysis and measures of theatre utilization as a starting point for benchmarking.

CONCLUSION

OT Utilisation is a useful measure to determine whether available OT capacity is being optimally used for any elective surgery. Maximizing the productivity of the operation theatres in hospital reduces cancellations, minimises overruns with consequent overtime staff costs and improves the flow of patients through the hospital. Utilisation is the measure of productive time over the available time. The overall OT utilisation rate can be further examined at room level or by speciality unit and surgeon.

OT utilisation is dependent on a number of phases, each of which may require to be specifically measured to determine where improvements in utilisation rate should be focused.

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- 2) Association of Anaesthetists of Great Britain and Ireland (2003). Theatre Efficiency, Safety,
- 3) Quality of Care and Optimal Use of Resources. Cited in:
<http://www.aagbi.org/sites/default/files/>
- 4) Theatre efficiency03.pdf.
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- 6) Health and Finance – Forum. South Africa Medical Journal, 103(5) (285-287)



A STUDY ON SURGICAL BED UTILISATION
IN THE ECONOMIC WARD,EAST WING
AT
MAX SUPERSPECIALITY HOSPITAL,SAKET



**Institute of Health Management Research,
Jaipur**

DECLARATION

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

I would like to state that I have carried out my Internship on the topic “A study on surgical bed utilisation in the economic ward, East wing, Max hospital, Saket” under the guidance of Dr. Sandeep Mor (Deputy Medical Superintendent) at Max Super Speciality Hospital, Saket, New Delhi for the partial fulfillment for the degree of MBA in Hospital and Healthcare Administration.

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

Dr.Akanksha Mamgain

IIHMR University

(2015-2017)

INTRODUCTION

Bed occupancy and the ratio of beds per population remain predominant metrics in hospital capacity planning. There are several problems associated with this approach. Most importantly, bed numbers or bed occupancy do not provide a good measure of the services provided inside hospitals, given the wide variation in case mix and thus treatment costs of those occupying the beds, nor are they suitable for predicting future demand. The measure implies that the bed is the core piece of capital stock in the hospital, constraining the performance of the other assets around it. The near universal trend towards growing numbers of day cases and shorter lengths of hospital stay further invalidates beds as a measure of capacity.

Traditionally, hospitals were designed around specialties and departments rather than around the needs of patients. Patients often spend most of their time in hospitals waiting for something to happen, with large areas provided for this inactivity. The situation is often exacerbated by the inefficient management of admission and discharge. A consequence is that in many hospitals the flow of patients is inefficient, dislocated and disorganized. Yet poor patient flow impairs patient and staff satisfaction, and the effective utilization of resources. Several factors, including the growing complexity of treatment and a willingness to see the care process from the patient's perspective, have rendered this situation unacceptable, leading to demands for care models based on syndromes, care processes and patient pathways.

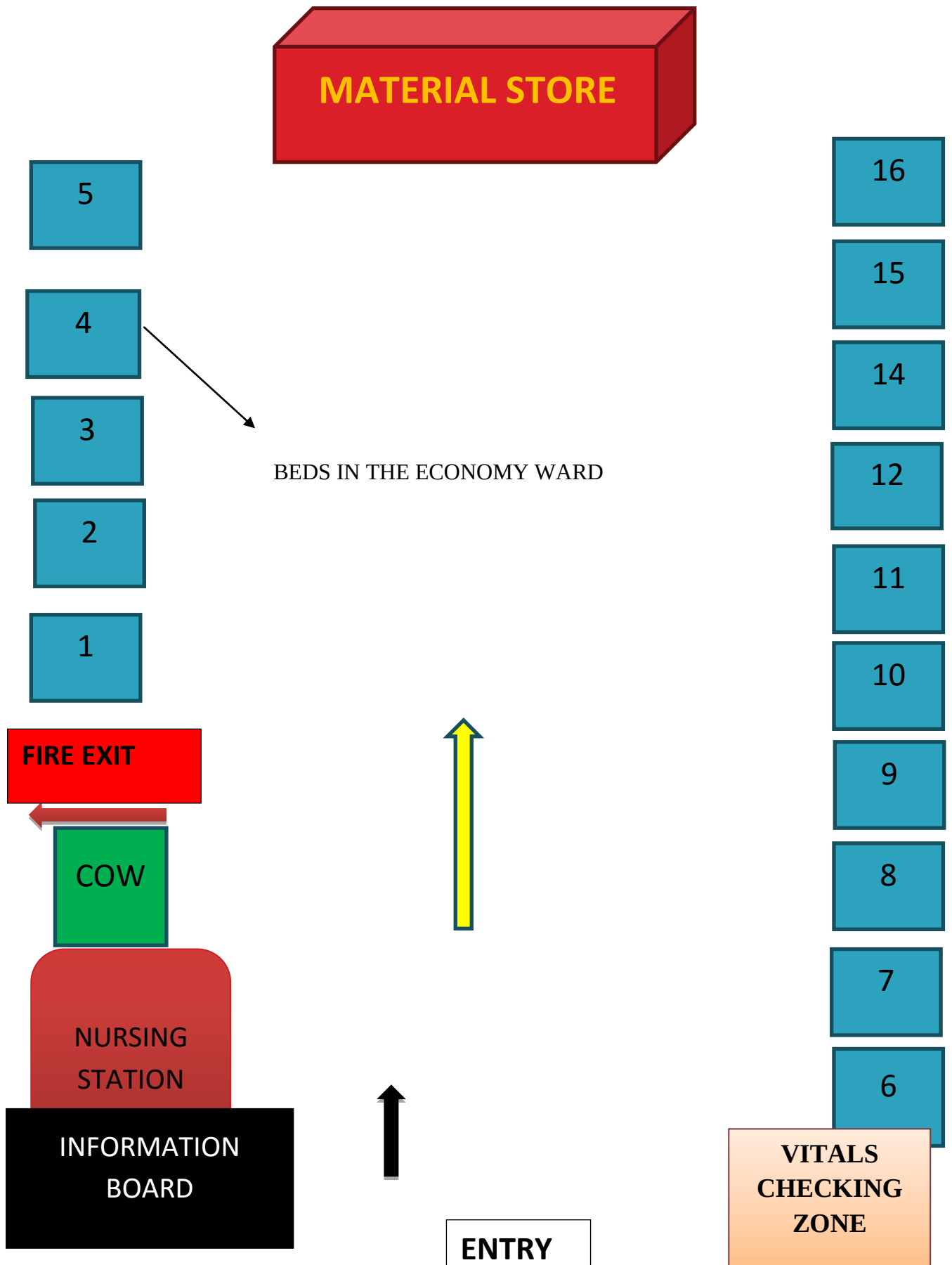
A major implication of applying management theory to health care is the need to separate different flows of patients, work and goods, enabling each to move according to its own logic and pace. For hospitals, this means that the focus should not be on similar clinical conditions but rather on similar processes. Improving patient flow has major implications for our understanding of hospital capacity. Rather than counting beds, a new definition of capacity could start from a description of the pathways travelled by patients, whether in batches or as flows, followed by identification of those elements that can constrain them (the bottlenecks). In some cases, this could be the number of beds but in others it will be operating theatres, diagnostic equipment or particular specialist staff – in each case, these depend on the particular site and its relation to the local health-care economy. It is necessary to examine how these elements are configured within and outside hospitals, recognizing that many pathways will join together at bottlenecks, such as in operating theatres, before going their separate ways. The key to successful capacity planning is then

to ensure that each patient travels along the shortest (or least costly) path possible within the network, encountering as few delays at bottlenecks as possible.

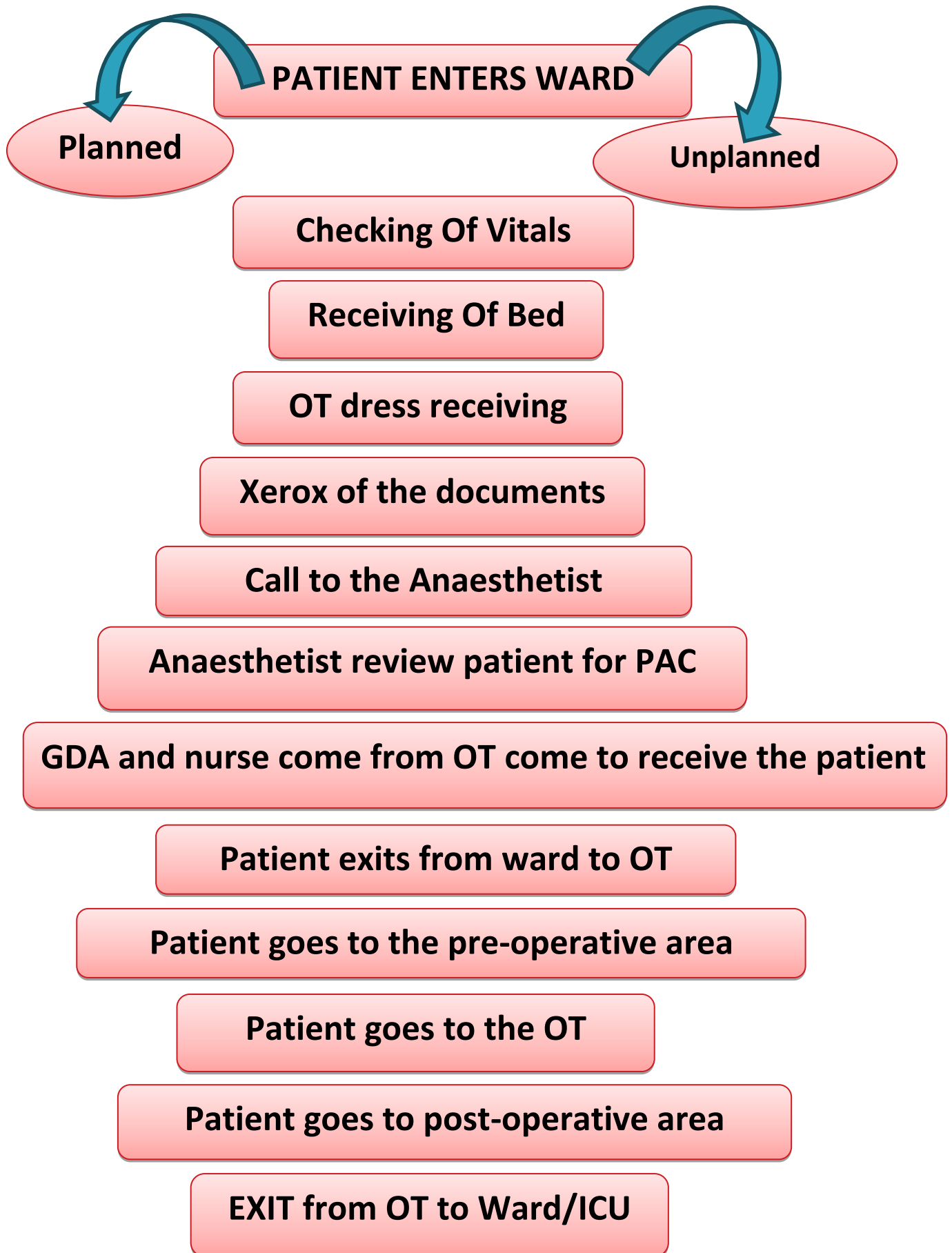
Our study was done in the economy ward located on the ground floor of east block of Max Super speciality Hospital. The economy ward is a 15 bedded ward. The patients undergoing general surgery, ENT surgery, Internal medicine and post-surgery are admitted here. There are seven nurses working in three different shifts which are morning (8:00a.m to 2:00a.m.), evening (2:00p.m to 8:00p.m) and night (8:00 p.m. to 8:00 a.m). There are two staff nurses and one team leader in the morning shift, two staff nurses each in evening and night shift.

This ward is for providing services to economically weaker section patients but due to unavailability of the beds in other wards of the hospital, patients (cash/TPA) from these wards are admitted in the economy ward.

The layout of the economy ward is as follows:



PROCESS FLOW IN THE WARD



REVIEW OF LITERATURE

The availability of hospital bed has always been a problem in developing countries. The availability of beds is perhaps the most important single factor in determination of the hospital utilization in a country. In India, shortage of hospital beds is a huge problem, the average bed population ratio being 6.8 / 10,000. Moreover the cost of construction of a new bed is also to an extent of Rs. 50,000 to Rs. 100,000 added to its huge maintenance cost. This situation is further deteriorated by population explosion, increasing the flow of patients and rising demand for hospitalization. On the other hand, hospital facilities may not be fully utilized due to a multitude of factors, including medical and social customs.

Bed in this context represents not simply a place for the patient to sleep but the services that go with being cared for by the medical facility that is admission processing, physician time, a nursing care, necessary diagnostic work, appropriate treatment and so on.

Bed utilization the number of hospital beds occupied by patients expressed as a percentage of the total beds available in the ward, specialty, hospital, area, or region. It is used to assess the demands for hospital beds and hence to gauge an appropriate balance between demands for health care and number of beds.

The role of the hospital can be fully studied only by taking into consideration all aspects of hospital service that is by including the services to the community on an out-patient as well as an in-patient basis. However, the concept of "hospital utilization statistics" is relatively less known in our country.

Various indices are utilized in the assessment of hospital utilization. Hospital bed utilization indices will provide trends and pattern of hospital utilization. Davis and Macula (1996) have described the indices related to hospital:-

Average length of stay (ALOS)

Bed occupancy rate (BOR)

Bed turnover interval (BTI)

Shortage of beds can result in cancellation of admissions for planned (elective) surgery, admission to inappropriate wards (like surgery patients in medical wards) and transfer of

existing in patients between wards which will add a day to a patient length of stay. To maintain a certain occupancy rate, depends upon several factors of hospital as hospital size, number of non-substitutable patient facilities, the present of non-urgent beds, and the number of hospital serving an area.

In the UK during 1997–98, average bed-occupancy levels varied between around 50% and 99%. However, most National Health Service (NHS) acute trusts reported periods during which inpatient bed demand exceeded availability. At those times, emergency patients were more likely than usual to be assessed and have treatment initiated in EDs before moving to an inpatient ward. Furthermore, those hospitals with higher average bed-occupancy rates cancelled a significantly higher proportion of elective operations and had longer delays in the transfer of patients from the Emergency department to inpatient beds. It was acknowledged, “Hospitals with average occupancy levels above 85 per cent can expect to have regular bed shortages and periodic bed crises”. It has been suggested that reducing bed-occupancy rates below a “threshold” level should reduce excessive waiting times in Emergency Departments.

Observations made within the NHS have been used to develop a discrete-event stochastic simulation model to study the relationship between demand and available hospital bed capacity. This model suggests that there is a discernible risk of a hospital failing to provide sufficient beds, and thereby safe, efficient care, when average bed occupancies exceed 85%. A hospital with an average bed occupancy of 85% would be expected to “be short of beds for admissions on four days in a year”, with disruption of normal function of up to 8 weeks. The authors concluded “spare [bed] capacity is essential if an emergency admissions service is to operate efficiently and at a level of risk acceptable to patients”. In 2005, the average hospital bed-occupancy rate was shown to be 84% in the UK compared with 64% in the Netherlands, with the same number of acute beds per head of population in both countries. In the Netherlands, where, notably, nursing home patients have access to care that avoids the need for admission in an acute facility, bed pressures did not affect admission decisions.

RATIONALE

This report is intended to find out the utilisation of the beds. In the economy ward, 5 out of 15 beds are being reserved for the surgery patients whether planned or unplanned,

irrespective of patients turning up or not. With the help of this study we want to check whether advance blocking the bed is required or not. And if required, then how many beds should be blocked? This study will also help us to analyse whether there is a delay in the process of patient flow and the reasons for this delay.

This delay leads to bed-blockage which further results in ineffective utilisation of the beds and improper usage of hospital resources.

OBJECTIVES:-

To check the effective utilisation of beds booked for the surgery patients in the economic ward.

To observe the patient flow from “entry into the ward” and “exit from OT”.

To examine the areas of delay and reasons behind it, at each and every level of the process flow.

METHODOLOGY

- **Type of study** : observational cross-sectional
- **Study population**: Planned/unplanned surgery patients, nurses, anaesthetist, surgeons in the economic ward at Max Super Speciality Hospital, Saket, Delhi.
- **Study area** –Economy ward ,East wing, Saket, Delhi
- **Duration of Study**– 1 month.(18th April, 2016 to 18th May 2016)
- **Type of Data** - Quantitative
- **Technique** – Direct observation to track the patients from entering the ward and coming back from OT.
- **Sample size** –23 patients.
- **Sampling technique**- Non probability sampling
- **Inclusion criteria**-

❖ All Surgery In-Patients, Nurses, Anaesthetist, Surgeons present in Economy ward, East wing, Max Hospital, Saket from 18th April to 18th May 2016.

➤ ***Exclusion criteria-***

❖ Other patients and doctors in the economy ward.

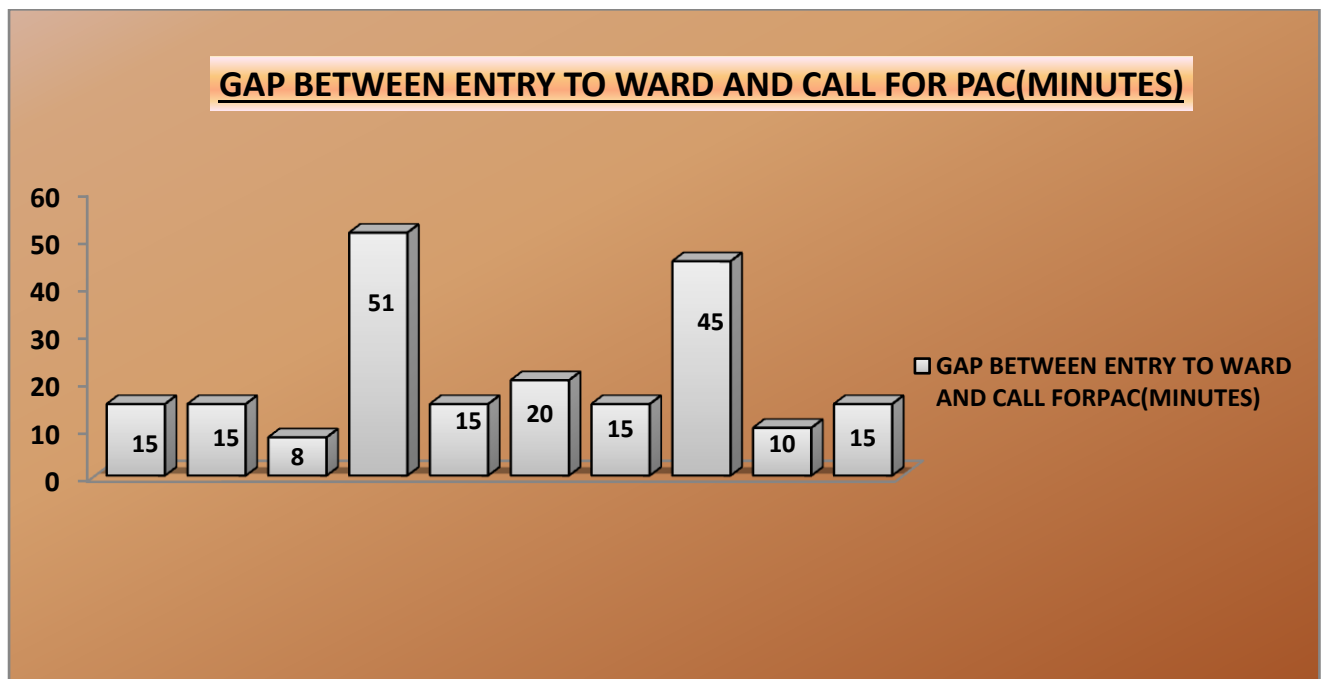
➤ ***Data collection*** - Quantitative (1 Month)

➤ ***Data entry-*** Manually

➤ ***Data Analysis-*** Using bar charts, pie charts, line charts.

DATA ANALYSIS:

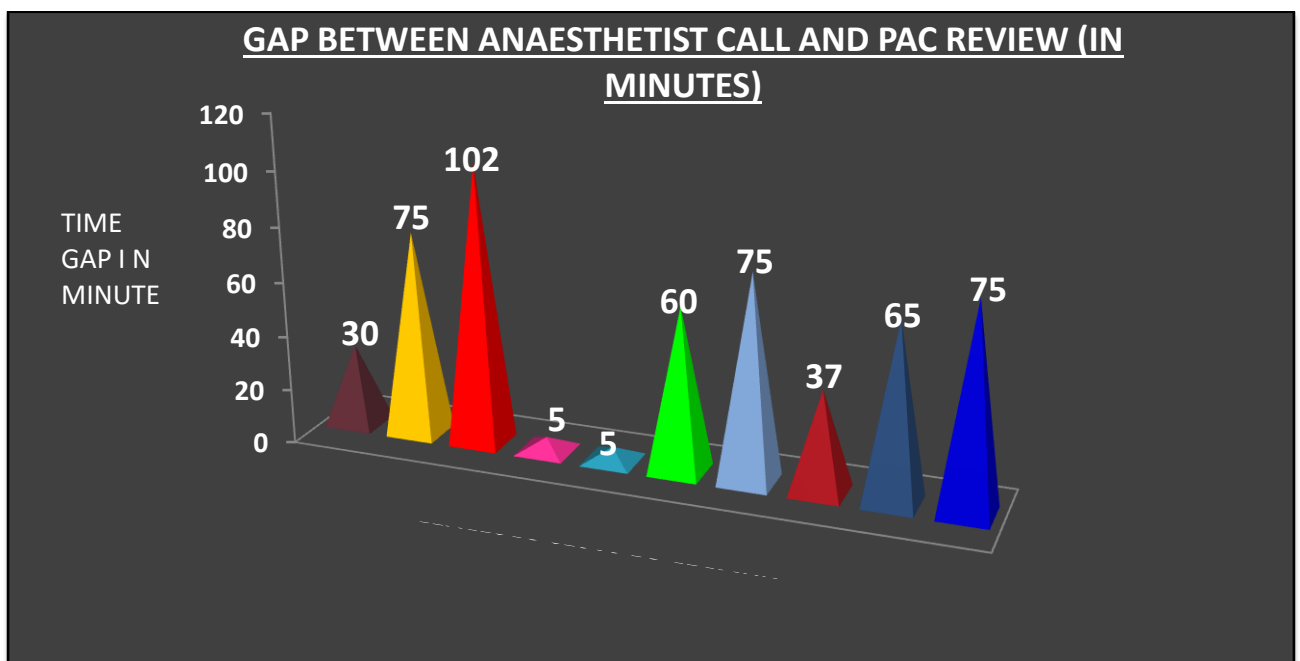
Figure-1



INTERPRETATION:

The maximum time gap observed between entry to ward and call to PAC is 51 minutes.

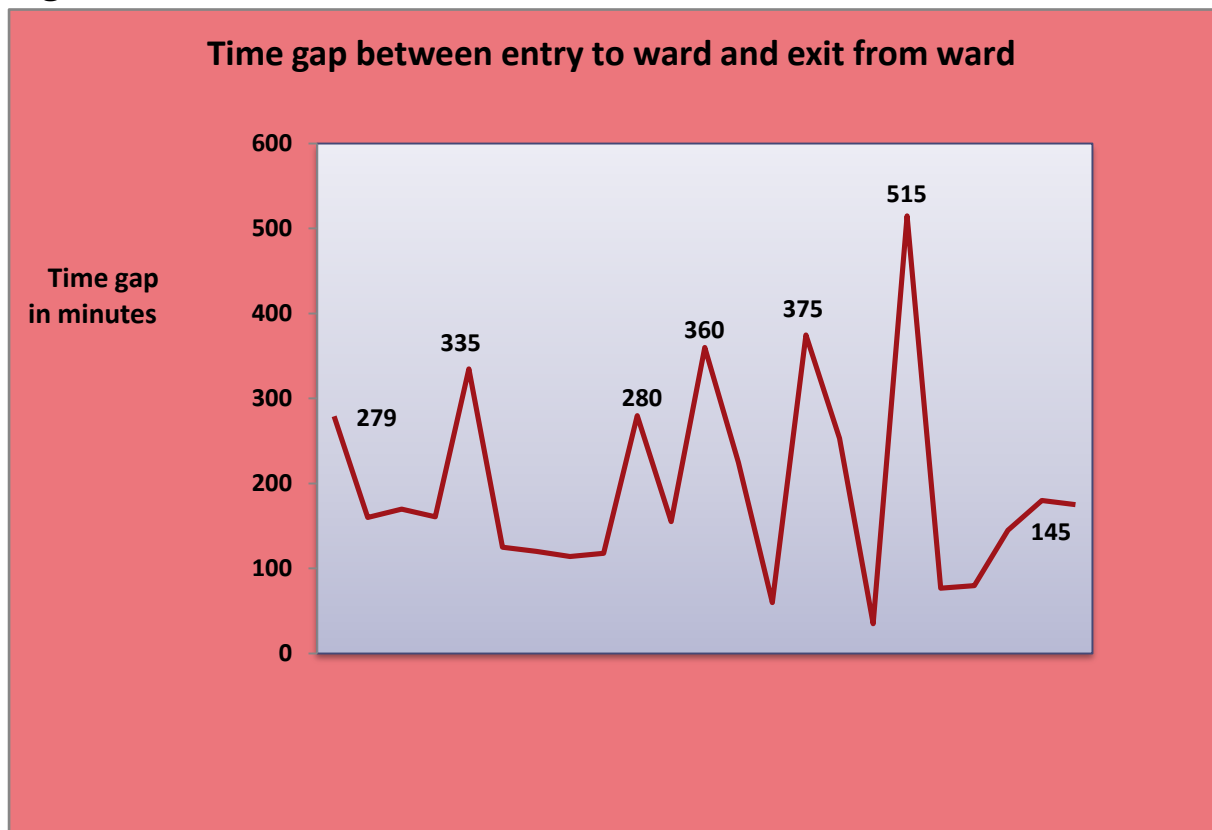
Figure-2



INTERPRETATION:

The maximum time gap recorded between anaesthetist call and PAC review is 102 minutes. This time gap contributes to one of the major reasons of the delay in the patient flow.

Figure-3



INTERPRETATION:

The maximum time gap between entry to ward and exit to OT is observed as 515 minutes.

Figure-4

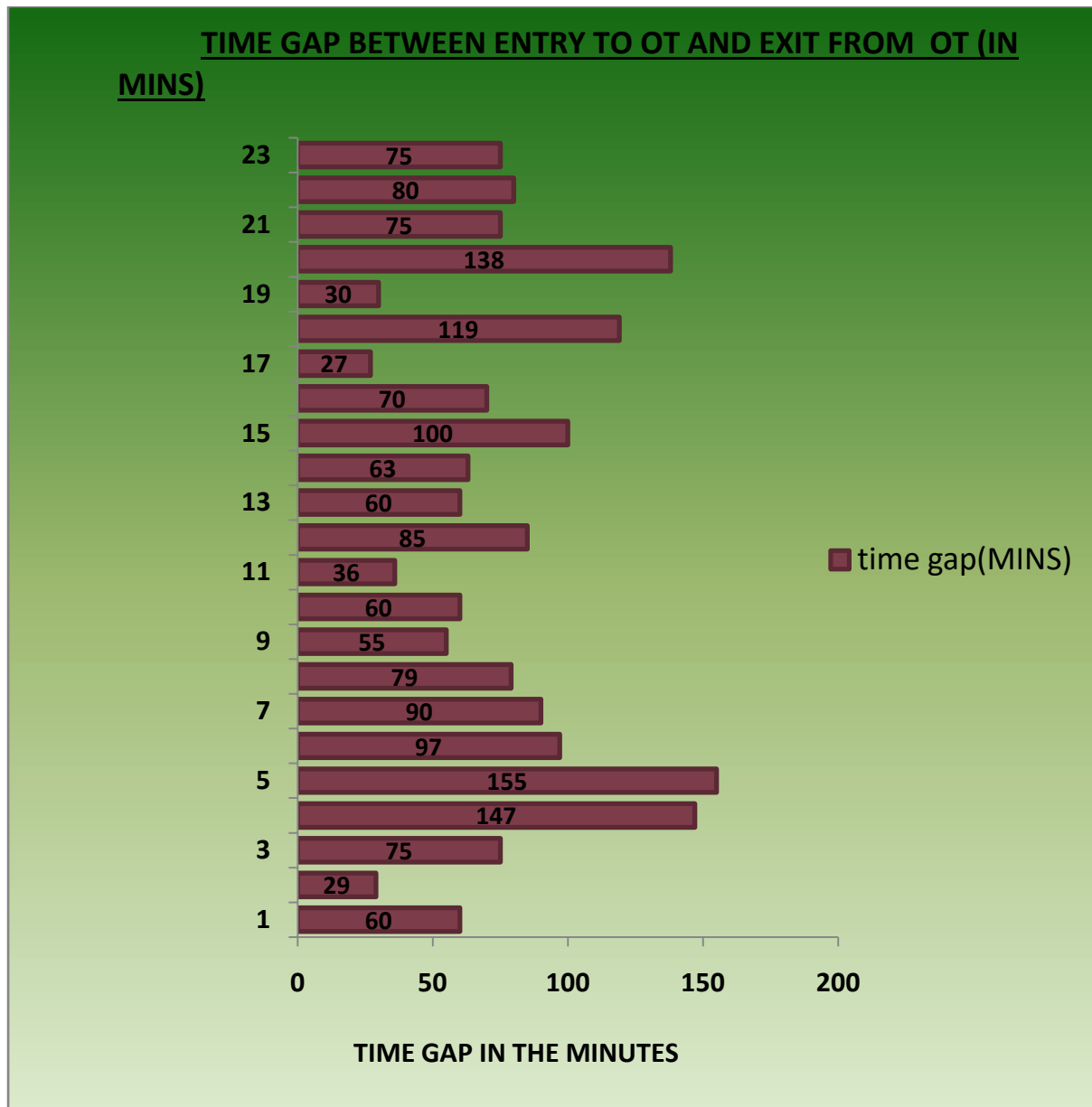
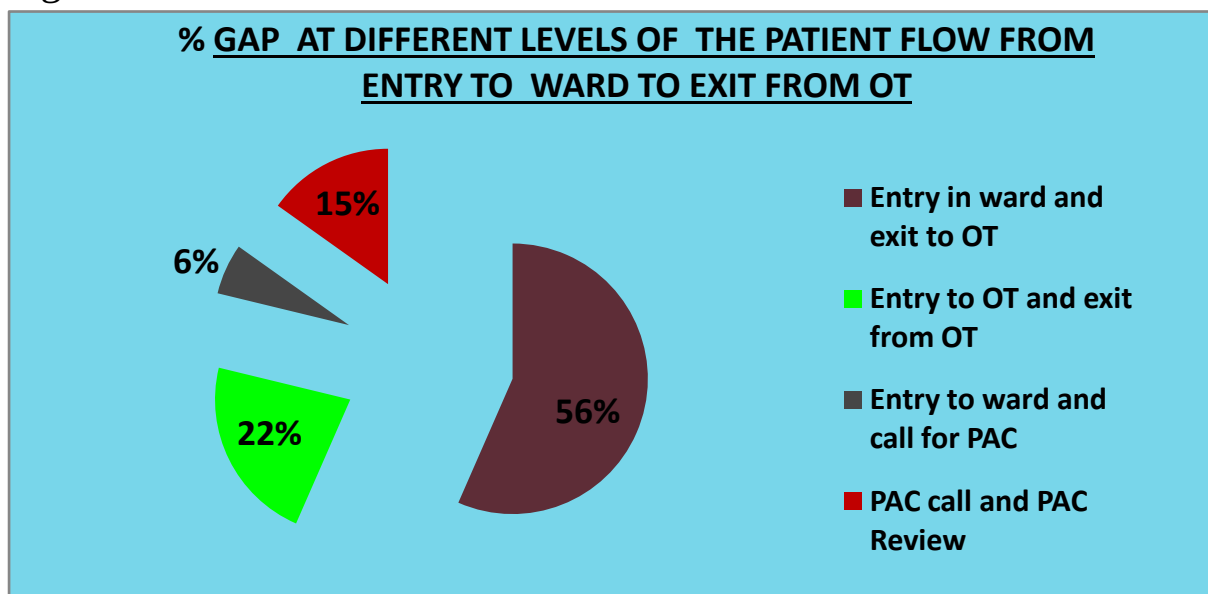


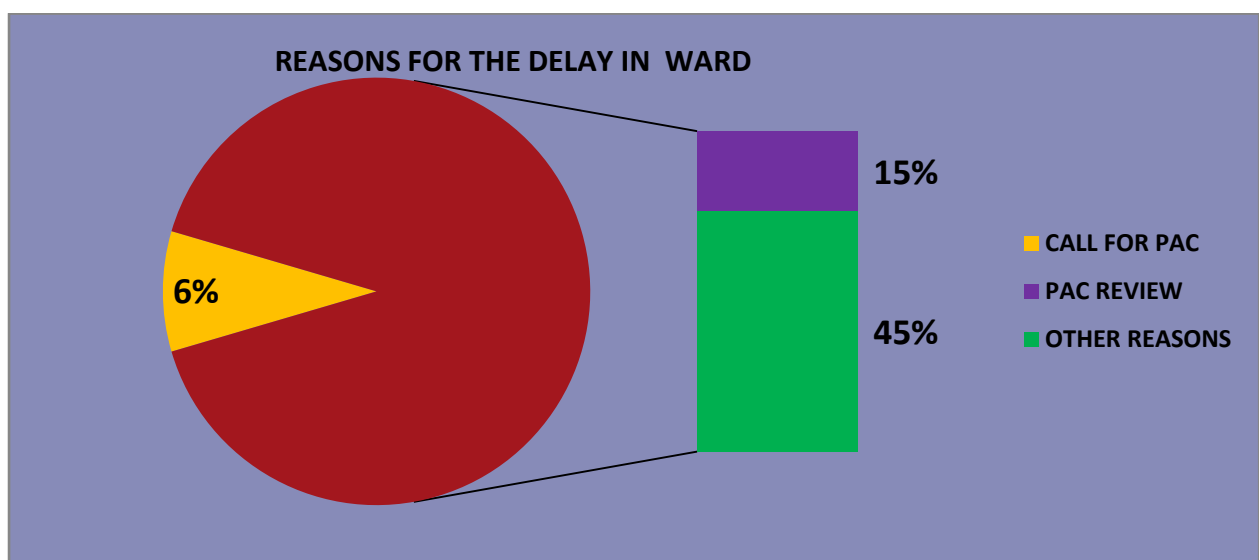
Figure – 5



INTERPRETATION

It is seen that the delay within the economic ward from patient's entry to exit for OT is 56%. This process also includes call to the anaesthetist and PAC review. There was a delay of 15% associated with the call to PAC and PAC review. The delay of 6% is seen in entry in the ward and call to PAC

Figure – 6



INTERPRETATION:-

There is 15 % gap in the case of PAC review whereas 6% in call for PAC.

There is a time gap of 45% in the OT due to other reasons like delay in reports, surgeon's unavailability and majorly financial clearance etc.

RESULTS

- The maximum gap between entry to ward and call to PAC is 51minutes.
- There was 102 minutes gap observed between anaesthetic call and PAC review.
- The maximum gap between entry to ward and exit to OT was 515 minutes.
- The maximum gap of 155 minutes was seen between entry to OT and exit from OT.
- There was a 6% delay due to delay in call for the PAC, 15% due to PAC review and other due to reasons like financial clearance, pending reports etc.

CONCLUSION

In our study of one month, we came across delays at various levels of the patient's process flow.

We observed that delay occurs due to financial clearance, medical clearance, lab reports not ready which all together accounts to 45% There was 22% delay observed in OT which includes unavailability of surgeons, anaesthetist, GDA, OT not prepared. Whereas 15% delay was due to Pre-Anaesthetist Check-up (PAC) and 6% is recorded by the nurses in the ward in calling the anaesthetist. The time of the patient is equally important as that of the surgeon .It should be the duty of the management to keep an eye on such delays and monitor them properly.

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RECOMMENDATIONS AND SUGGESTIONS

- ❖ The financial clearance of the patient should be done before scheduling of the surgery to avoid hindrance during the process flow
- ❖ The call to anaesthetist for pre-anaesthetic check-up (PAC) should be done as early as possible to avoid further delays.
- ❖ A day before the surgery, a list of the patients should be made and given to the anaesthetist, to help him with scheduling of PAC.
- ❖ There should be a turn-around time (TAT) for PAC to be done by the anaesthetist as PAC clearance has been observed to be one of the major reasons behind the delay.
- ❖ It should be the duty of the nursing staff to check that the patient's record file contains all the required reports needed before surgery. And then only the bed should be allotted to the patient.
- ❖ Any additional test recommended by the doctor at the time of PAC, should be done as soon as possible and reports should be made on an urgent basis.
- ❖ There should be no delay by the OT team in sending the GDA to the economy ward to shift the patient to the OT.
- ❖ The patient should not wait unnecessarily in the pre-operative recovery area due the improper management of OT scheduling.
- ❖ There should be availability of concerned surgeon and anaesthetist and no delay on their part.
- ❖ The OT should be prepared and cleaned before the arrival of the patient.
- ❖ There should always be availability of the GDA to shift the patient from post recovery area to the ward.



THANKS