



Summer Training
In
Max Super Specialty Hospital, Saket, New Delhi
(April 7th to June 7th, 2015)

A Report

By
Dr.Sahil Thakur

Post-Graduate Diploma in Hospital and Health Management
2014-2016



Institute of Health Management Research, Jaipur

CERTIFICATE

This is to certify that Dr. Sahil Thakur has undergone summer training at Max Super Specialty Hospital, Saket, New Delhi from 7th April to 7th June, 2015.

The candidate has himself carried out all the studies related to the summer training. His approach to the studies has been sincere, scientific and analytical. This summer training is a course requirement recommended before awarding the degree of Masters in Business Administration (MBA) in Hospital Management.

I wish him success in all his future endeavors.

Col. (Dr.) Ashok Kaushik (Retd.)
Dean (Academic and Student Affairs)
IIHMR University, Jaipur

Dr. Goutam Sadhu
Associate Professor
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SUMMER TRAINING CERTIFICATE

This is to certify that Dr. Sahil Thakur of IIHMR, Jaipur Batch -19 of IIHMR University (Jaipur) has successfully completed his Summer Internship during 7th April - 7th June 2015.

The projects undertaken by him in Max Saket Super Speciality Hospital titled:

1. A study on Health care Associated Infections Management in Intensive Care Unit(ICU)
2. Study on the usage of the Restricted Antibiotic ≥ 3 , policy and it's compliance in Max Healthcare.

The project on evaluation fulfils all the stated criteria and the students findings are his original work.

I hereby certify his work excellent/good/satisfactory to the best of my knowledge.

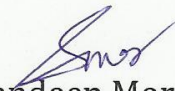

Dr. Sandeep Mor
DMS (Deputy Medical Superintendent)
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ABBREVIATIONS

S.No.	Abbreviation	Meaning
1.	AAMI	Association for the Advancement of Medical Instrumentation
2.	ABG	Arterial Blood Gas
3.	BBV	Blood Borne Viruses
4.	CABG	Coronary Artery Bypass Graft
5.	CAPEX	Capital Expenditure
6.	CAUTI	Catheters associated urinary tract infections
7.	CDC	Centres for Disease Control and Prevention
8.	CLABSI	Catheter linked associated bloodstream infections
9.	COW	Computer on Wheels
10.	CPRS	
11.	CSSD	Central Sterile Services Department
12.	CTVS	Cardiac Thoracic Vascular Surgery
13.	GDA	Ground Duty Assistant
14.	HAI's	Hospital Acquired Infections
15.	HIS	Hospital Information System
16.	ICPs	Infection Control Practitioners
17.	IPS	International Patient Services
18.	LAMA	Leave Against Medical Advice
19.	LASA	Look alike Sound alike
20.	MRSA	Methicillin Resistant Staphylococcus aureus
21.	MSSH	Max Super Specialty Hospital
22.	NABH	National Accreditation Board for Hospitals & Healthcare Providers
23.	NNIS	National Nosocomial Infection Surveillance
24.	OPEX	Operational expenditure
25.	PAC	Pre-Operative Assessment Clinic
26.	PPE	Personal Protective Equipment
27.	PPT	Partial Thromboplastin Time
28.	RA	Restricted Antibiotics
29.	RRT	Rapid Response Team
30.	TAT	Turn Around Time

OBSERVATIONAL LEARNING

INTRODUCTION

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



The pillars of this model include:

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

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

The hospital has four key areas of specialties:

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

MODE OF DATA COLLECTION

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

Sources of Data

➤ Primary

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

➤ Secondary

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

GENERAL FINDINGS

FRONT OFFICE

- **First contact point** between the patients / their attendants coming to the facility.
- Gives directions to them about the locations of various departments.
- 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.

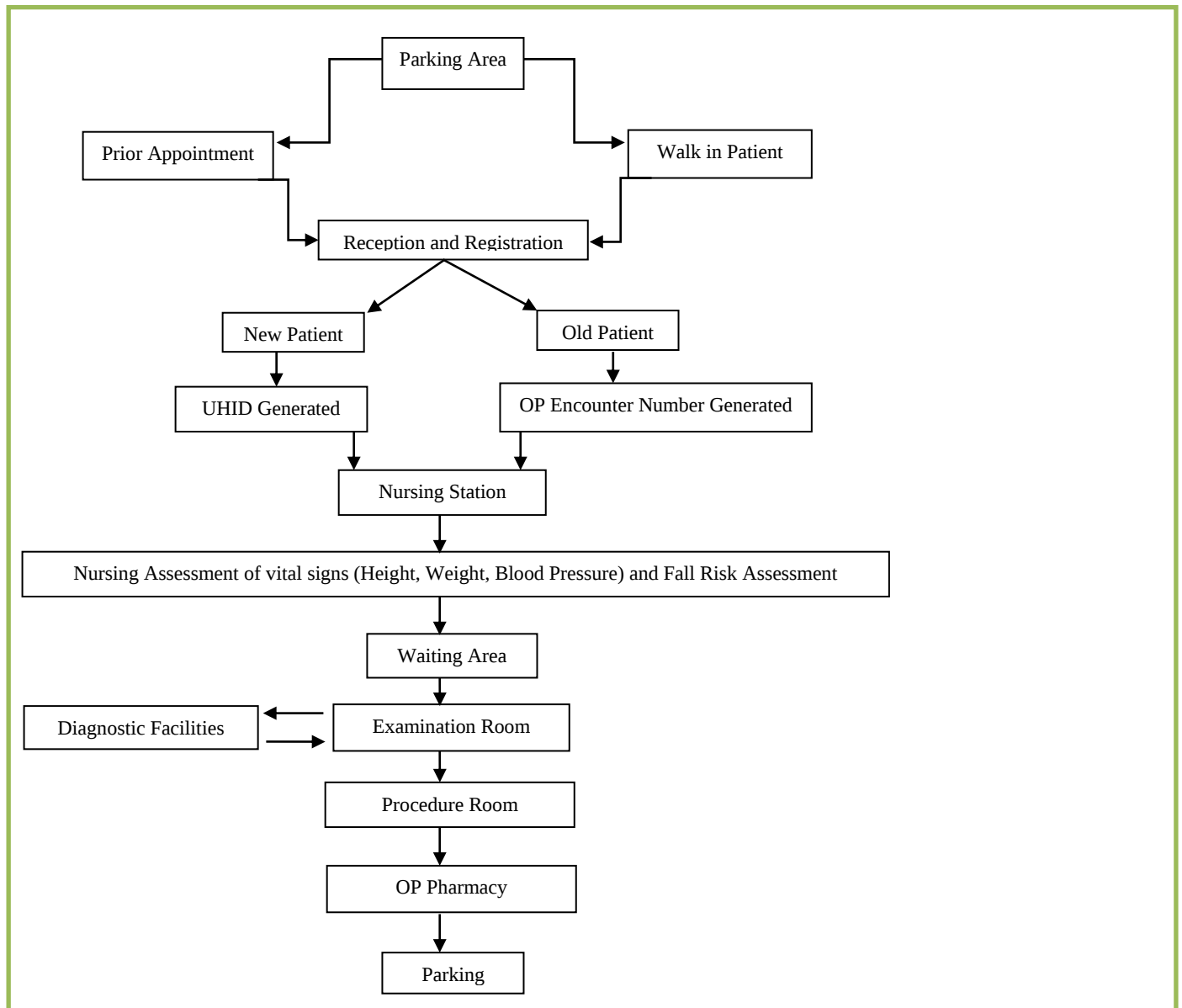
Challenges

- 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 industry.

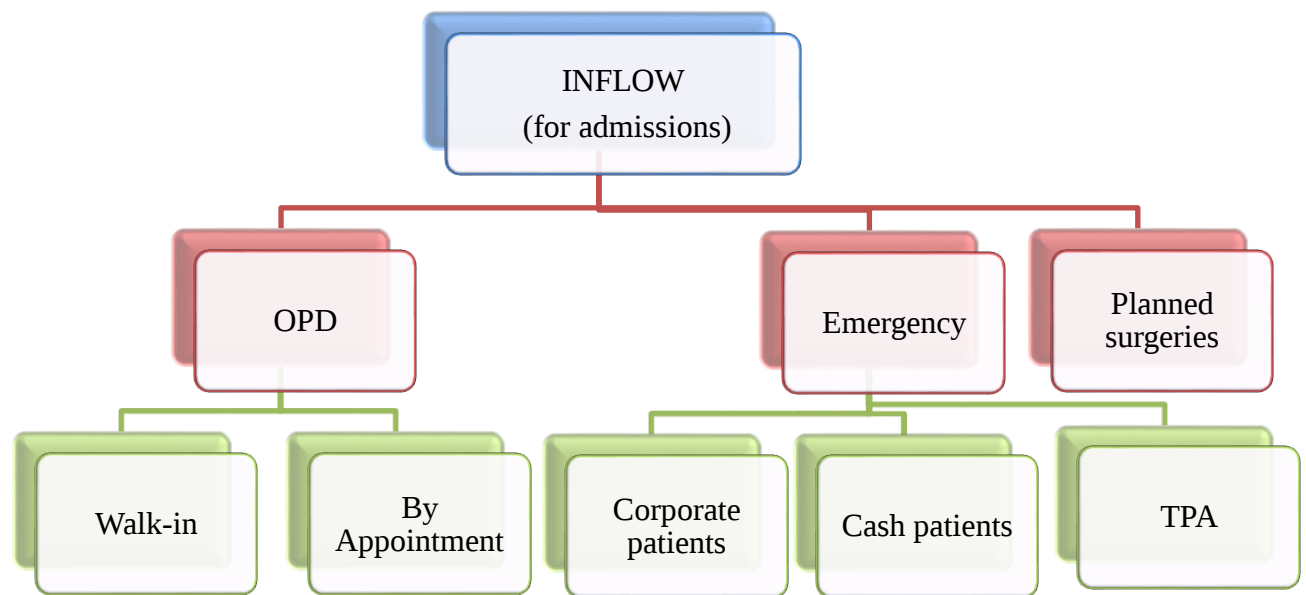
The general process flow that is followed in all the OPDs is as follows:



ADMISSIONS DESK

- If the patient has to be admitted to the hospital , he/she first reports to the admissions desk wherein all the paperwork is completed , do's and 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.

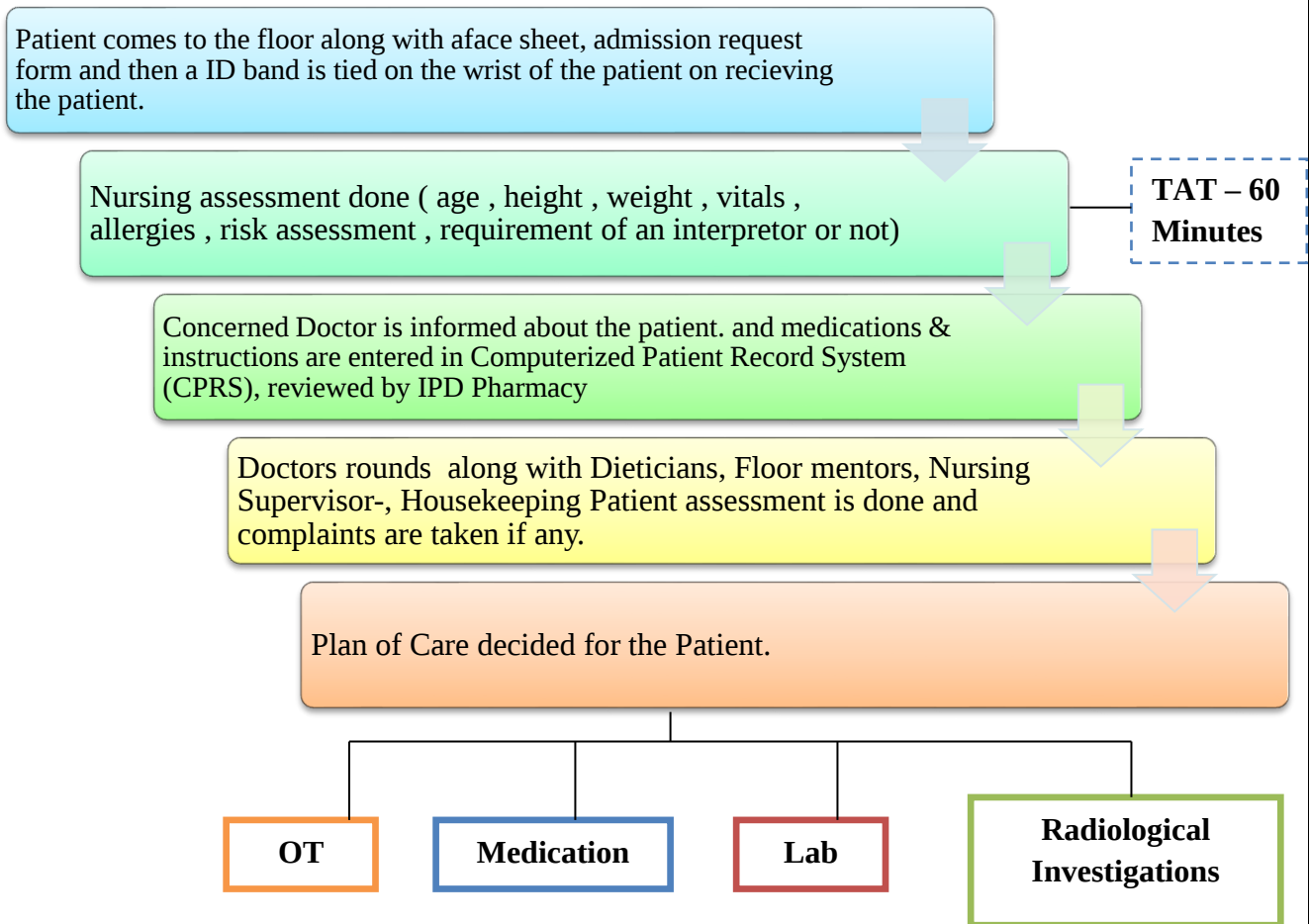
ISSUES- Huge departmentalisation which causes co-ordination problems



IN-PATIENT DEPARTMENT (IPD)

- IPD is distributed over four floors (3rd-6th) in the east wing and over five floors (2nd-6th) of Max hospital including a total number of 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



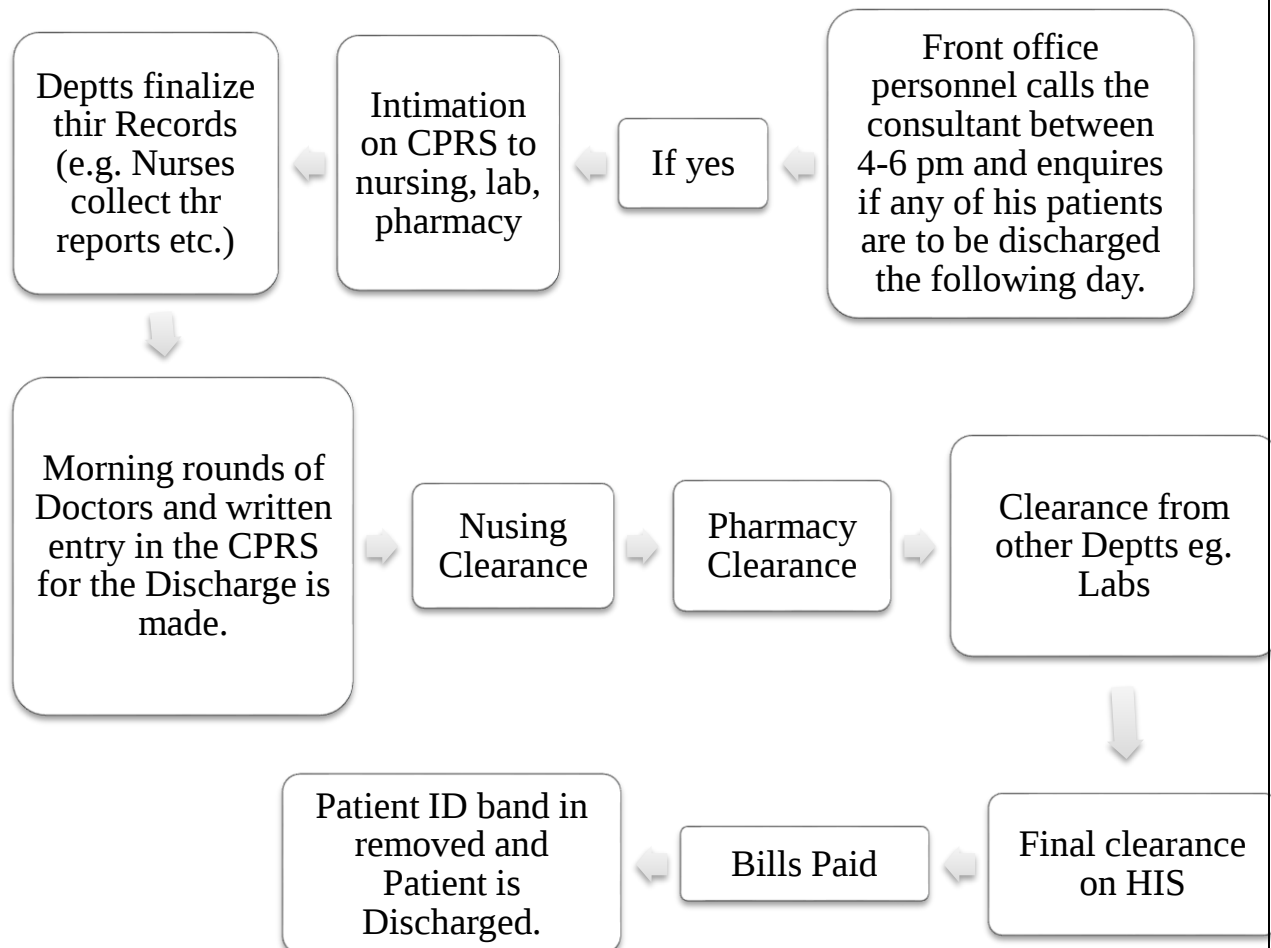
- **BARRIER NURSING-**

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

- **REVERSE BARRIER NURSING-**

Done in cases where patient is immuno compromised so that infection doesn't travel to him from others.

- Process of Discharge of patient from IPD.



EMERGENCY DEPARTMENT

Due to the unplanned nature of patient attendance, this department 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

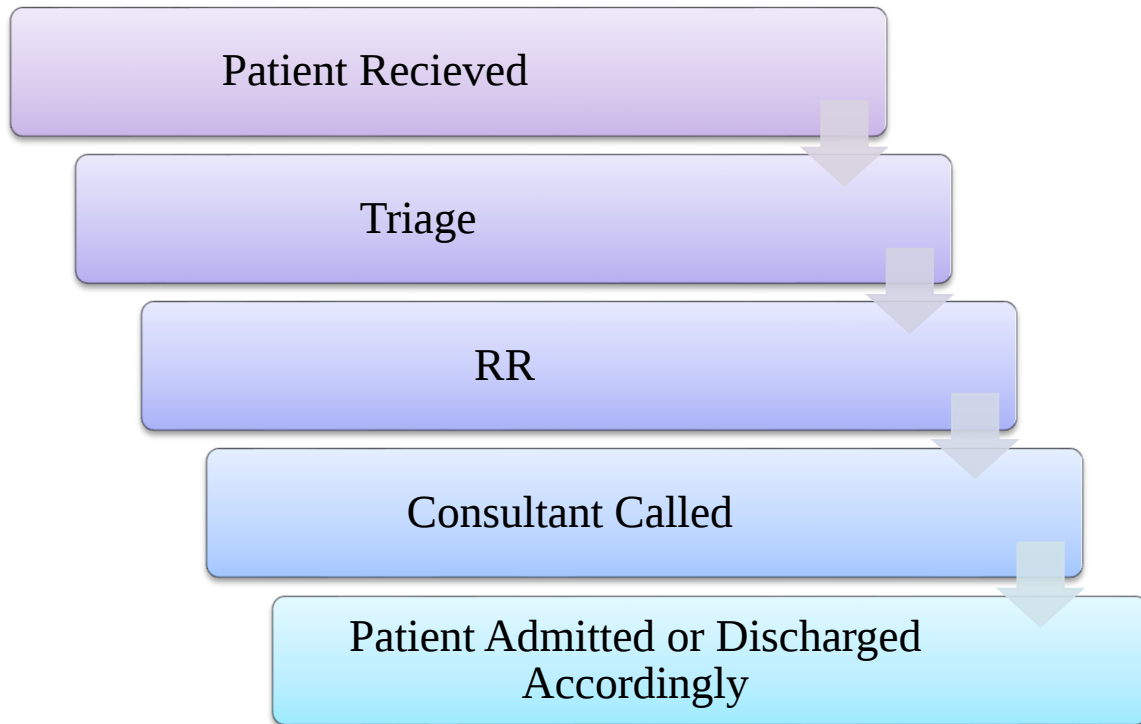
Infrastructure:

- 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

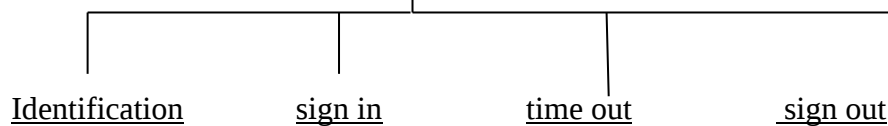
Operation theatre complex of East wing is located on first and second floor. Operation theatre complex has 11 operation theatre assigned to various departments. Cardiac, oncology , bariatric laparoscopic, gynaecology, ENT and plastic surgeries are performed in these operation theatres. Operation theatre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

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

- **Surgical safety check list includes**



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

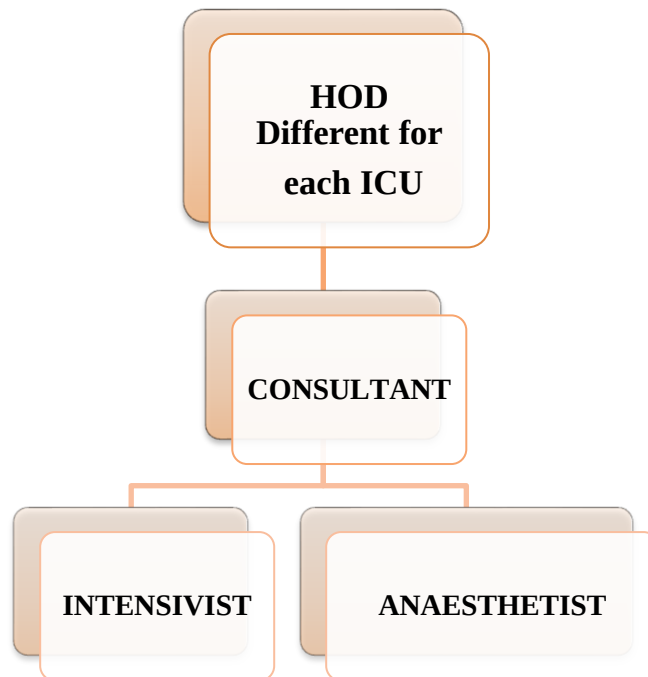
INTENSIVE CARE UNIT (ICU)

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

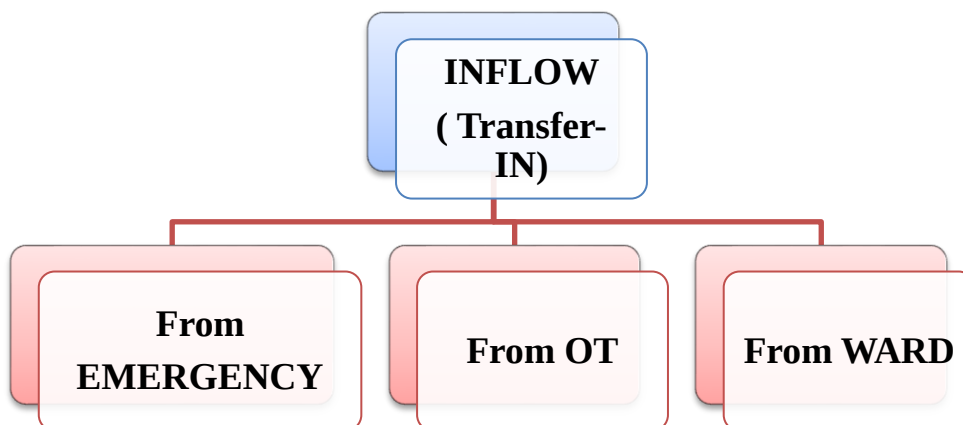
1. Respiratory ICU – 8 Bedded
2. Medical ICU – 8 Bedded
3. Neonatal ICU – 8 Bedded
4. Apex Coronary Care - Bedded
5. Stroke and Neuro Medical ICU - Bedded
6. Neurosurgical ICU – 8 Bedded
7. CTVS ICU - Bedded

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

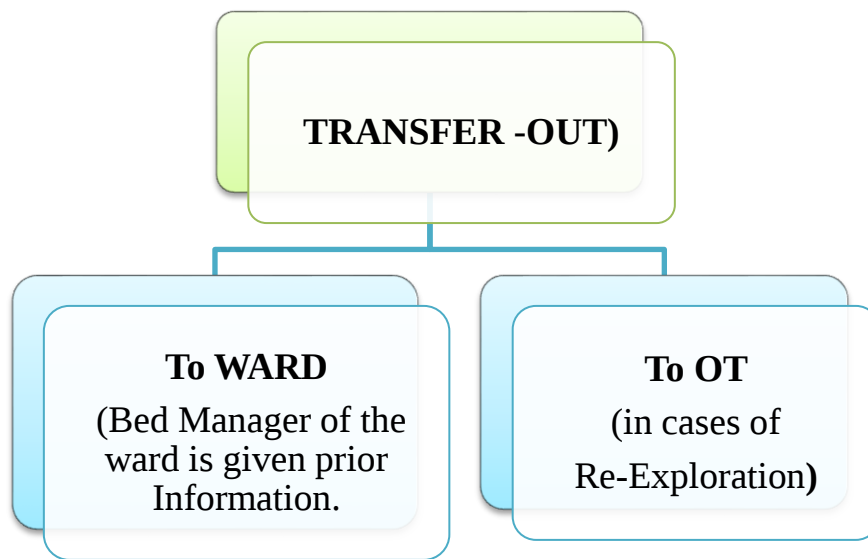
Hierarchy



Patient Flow



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

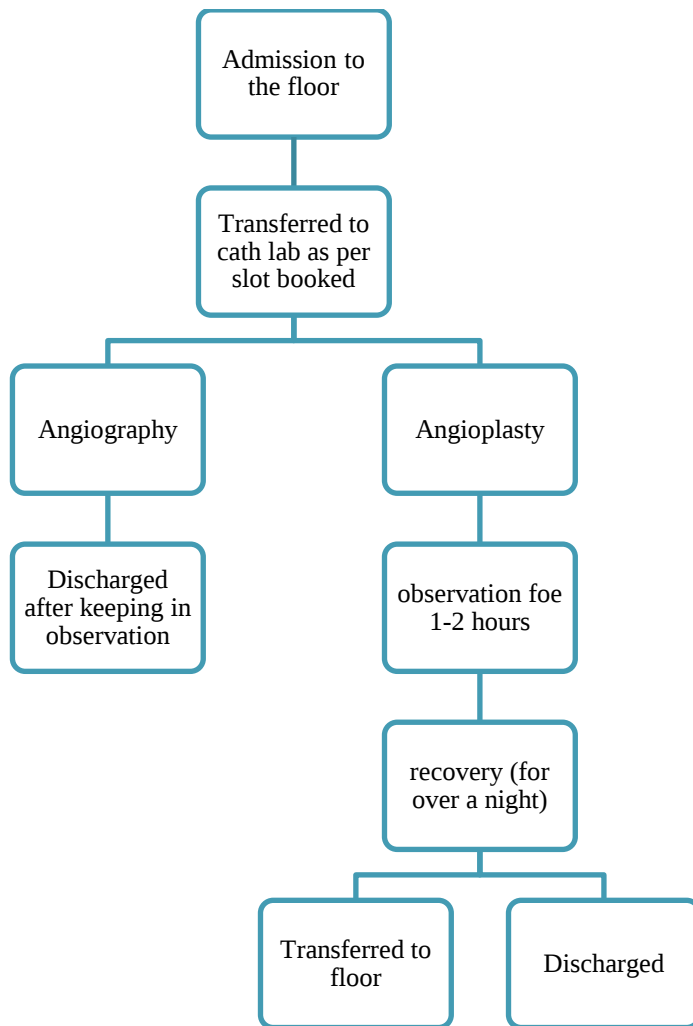
Units of cath lab:

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

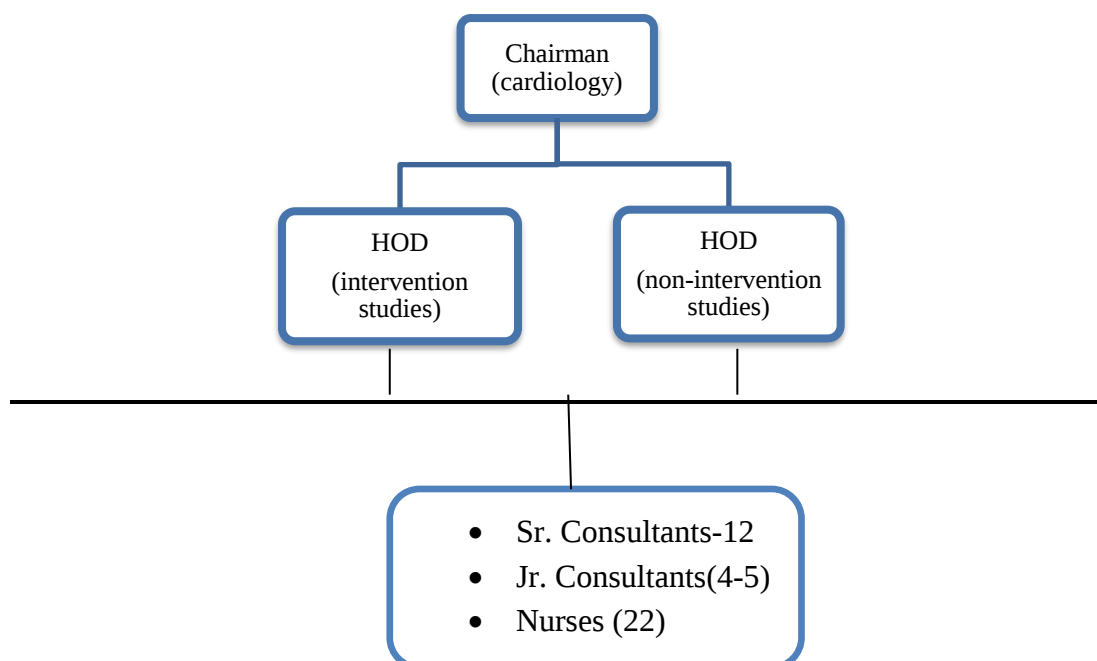
Location: Cath lab is located on the first floor with the vicinity areas as

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

Process Flow of Patients



Staff



DEPARTMENT OF LAB SERVICES

INTRODUCTION-

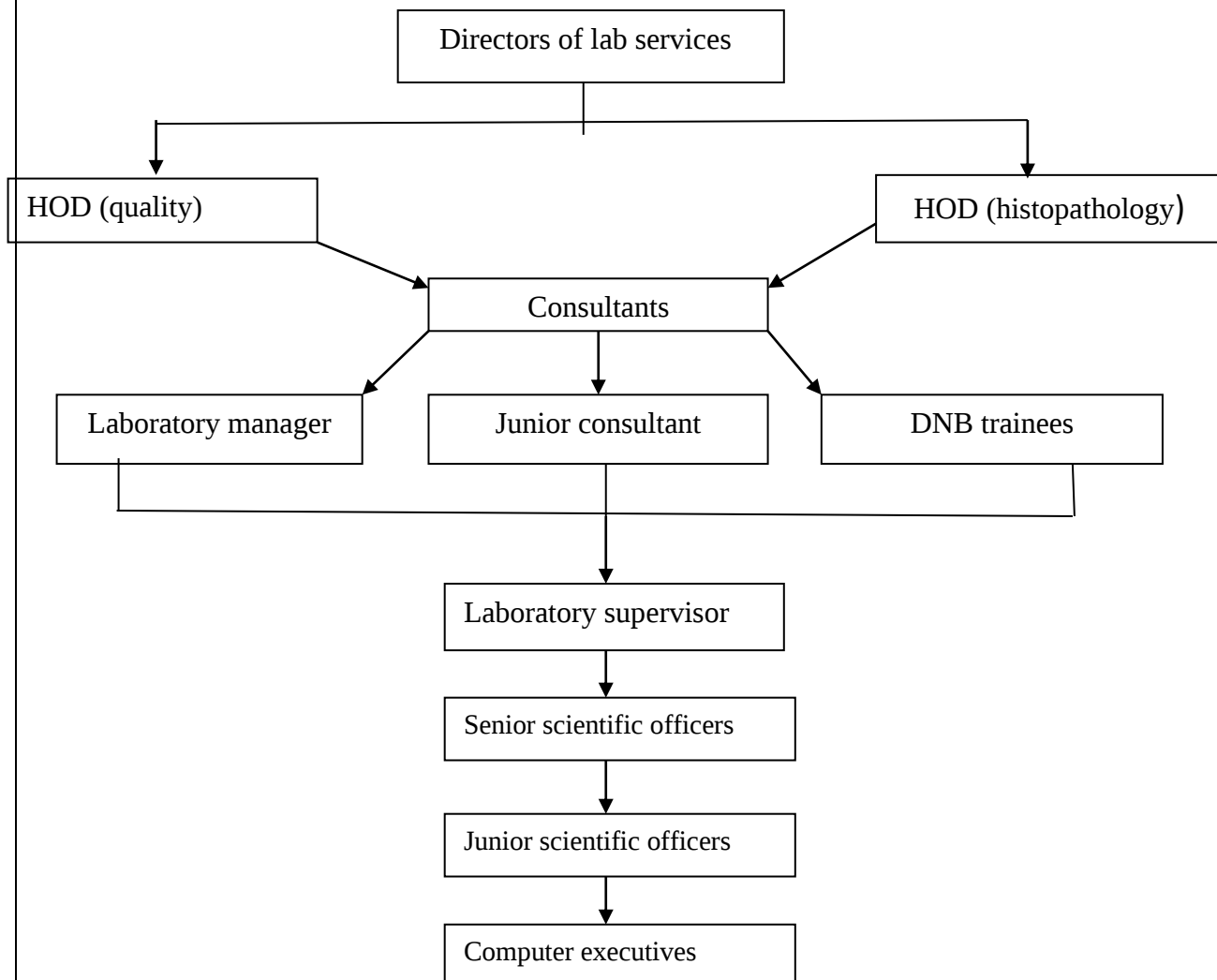
An ISO 9001:2000 certified lab, it is open 24 hrs a day. It's a high-tech lab with fully automated instrument which are directly interfaced with ***hospital information system*** and ***laboratory information system***. Facility of stat tests (emergency) and sample collection from home is also available.

LABORATORY COMPRISES OF THE FOLLOWING DEPARTMENTS-

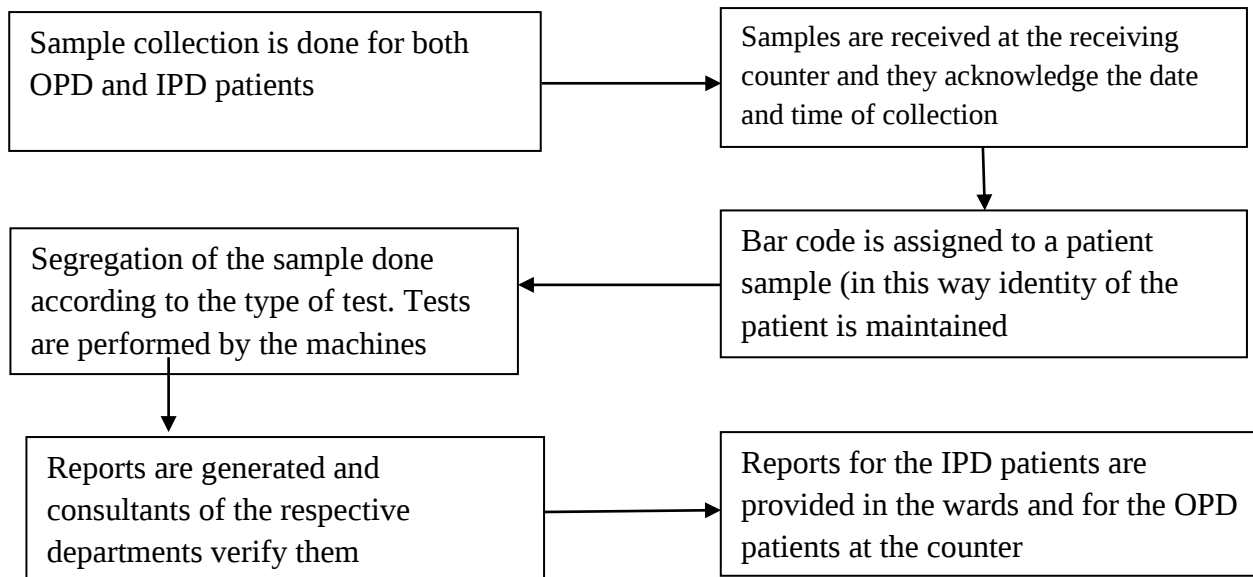
- Biochemistry
- Haematology
- Immunoassay
- Histopathology
- Clinical pathology
- Serology
- Microbiology

HIERARCHY- 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 (OPD)

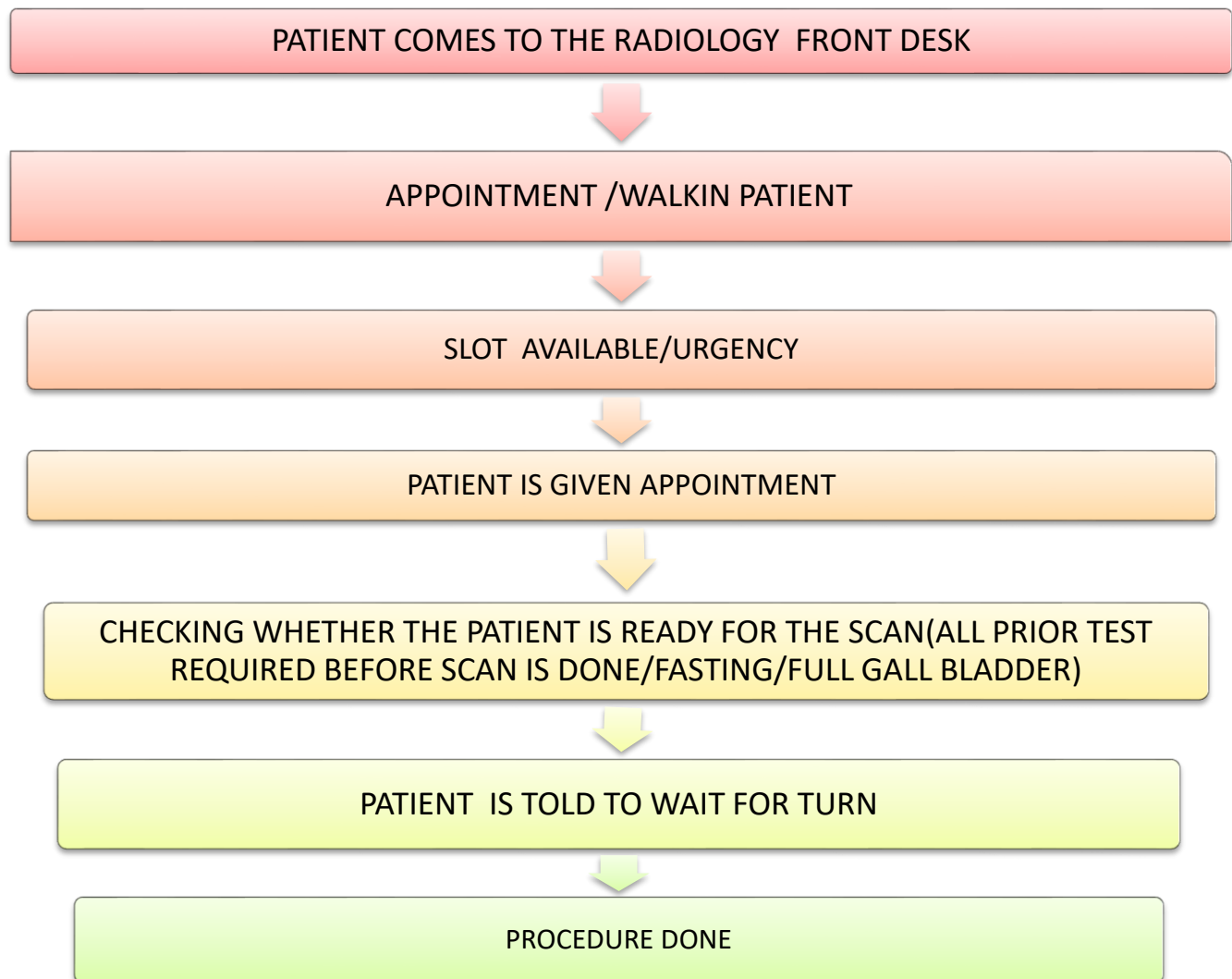


Figure:-Process flow in radiology department for outpatients.

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

- 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.

- The Department is headed by Dr.Sangeeta Pathak 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 $22\pm$ Celsius.
- The FFP (Fresh Frozen Plasma) are stored for 1 year at -40 degree Celsius.

CENTRAL STERILIZATION SERVICE DEPARTMENT

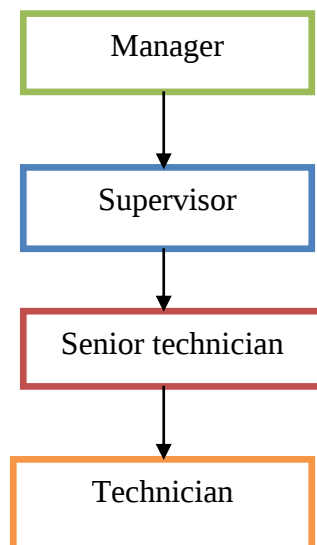
INTRODUCTION-

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-



The Department is headed by Dr. Sanjeev Bhatia.

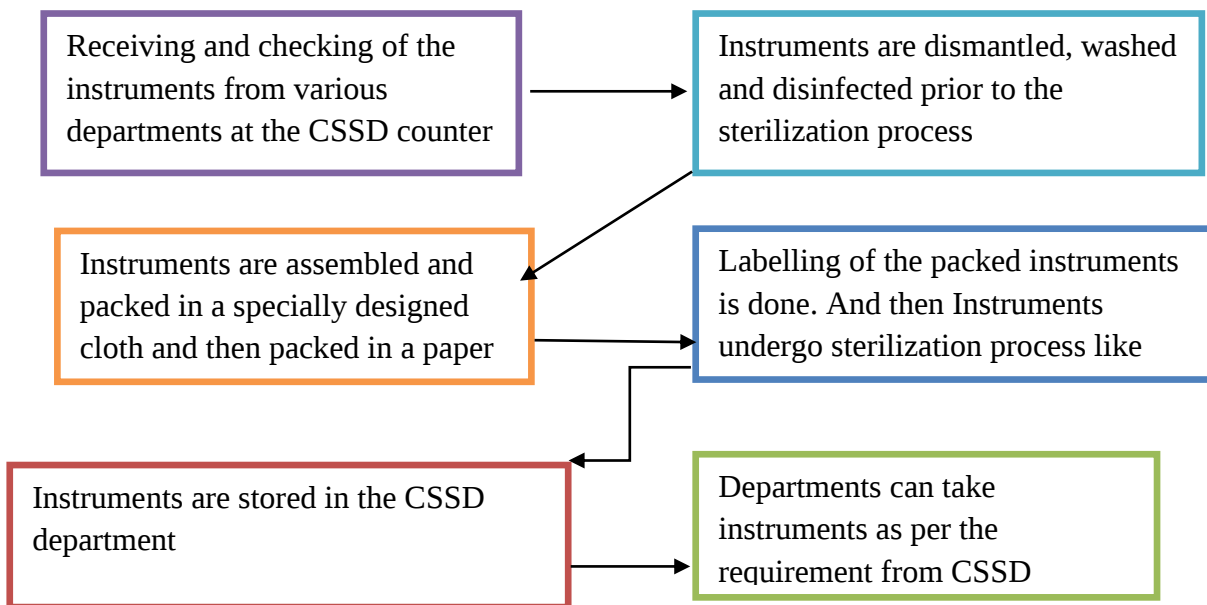
ZONES PRESENT-

- 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-

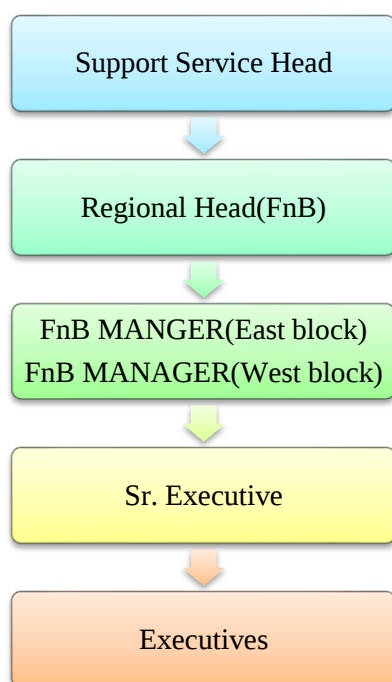
QUALITY INDICATORS-

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 also 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

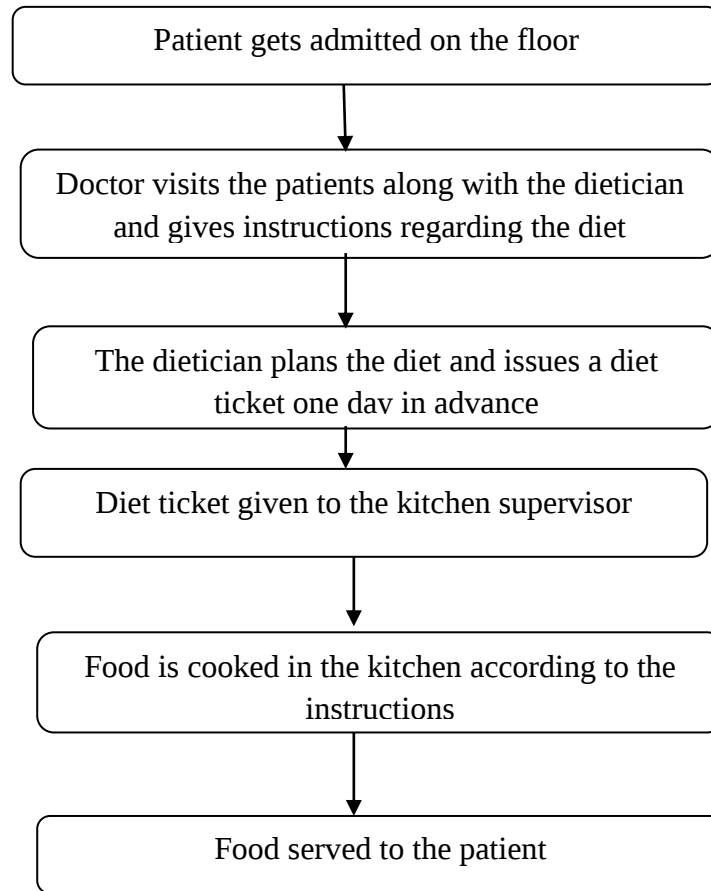


Time table for the diet of the patient

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

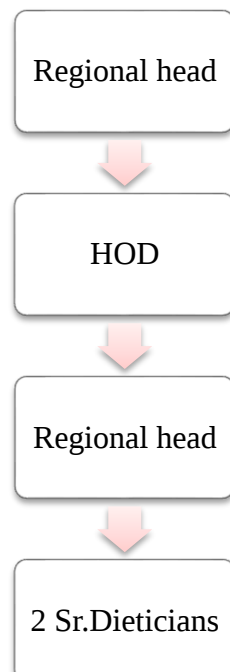
- Dinner of the same day, breakfast and lunch of the next day are decided prior in the evening and diet tickets are issued by the dietician and given to the chef.
- Apart from these if patients wants to have something extra, those can be provided to the patient after consulting dietician, but for an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

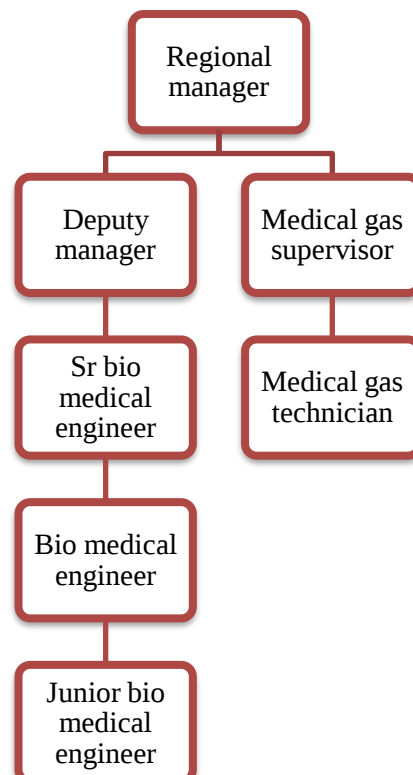
- The department plans diet for all IPD patients in accordance with the primary consultant's opinion on the same.
- Staff- 13 in total.
- Hierarchy



- 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



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

PHARMACY

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

PURCHASE

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

STORING OF DRUGS

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

INDENT AND DISPENSE OF MEDICATIONS.

In patient pharmacy-

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

NARCOTICS DRUGS

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

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

LOOK ALIKE AND SOUND ALIKE DRUGS

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

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

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

Licences acquired by Max hospital pharmacy -

- 1) Pharmacist License
- 2) Narcotics License

INVENTORY MANAGEMENT PARAMETERS

I. ABC Class

A Items: 7 days

B Items: 10 days

C Items: 15 days

II. EOQ - (economic order quantity)

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

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

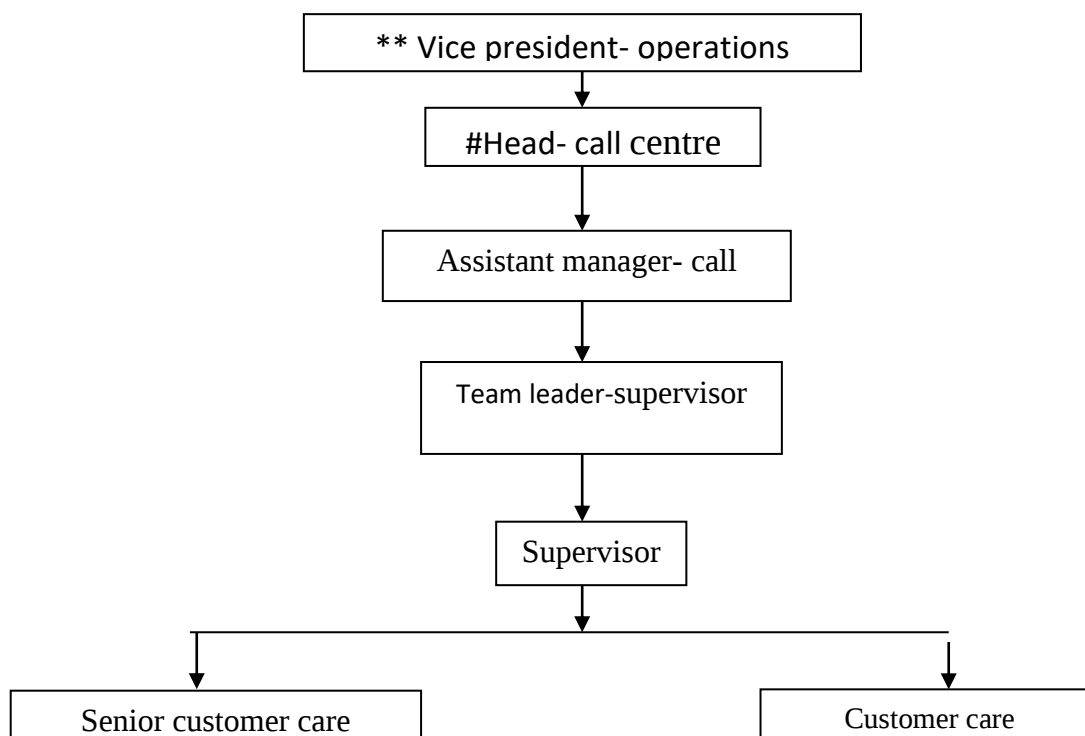
CALL CENTRE

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

Call centre deals with:

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

Organization chart:



SECURITY DEPARTMENT

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

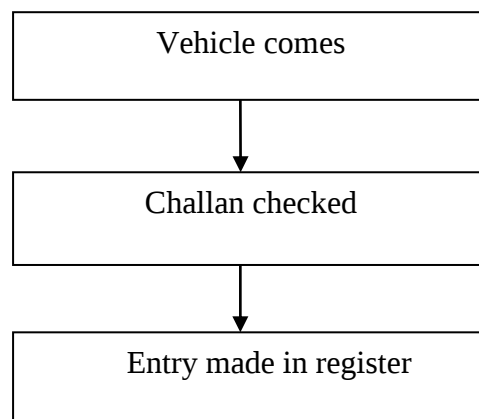
Functions of Security Department:-

1. Security management:-

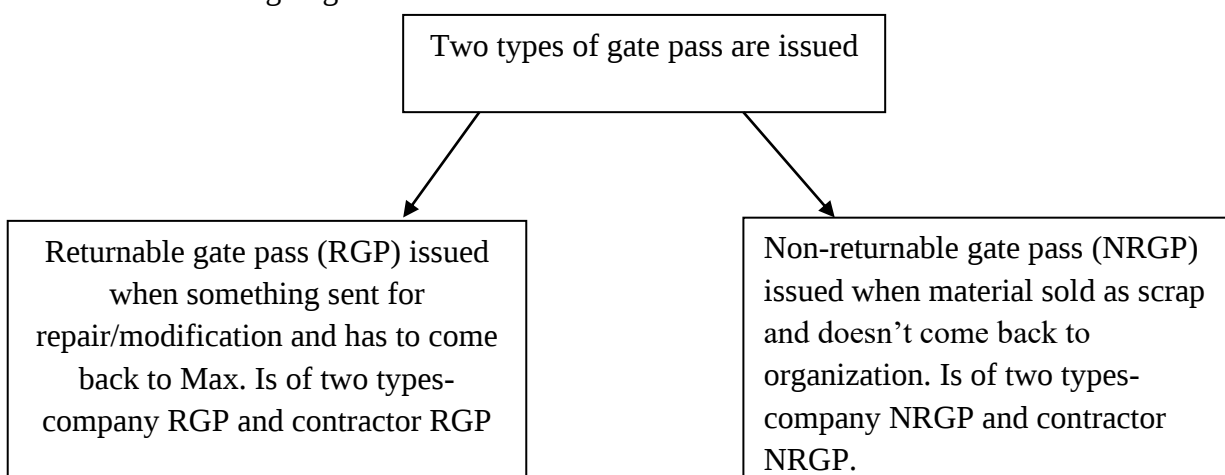
- Selection of people(guards and supervisors)
- Deploying of security staff to different floors and departments
- Checking of people entering hospital
- Turnout and grooming of security staff
- Training of security staff
- MLC handling
- Dispute handling

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

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



b. Flow for outgoing materials



3. Disaster management.

There are six emergency codes:-

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

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

Walkie talkies are an important source of communication.

Other disasters include floods, water logging, terrorist attacks.

4. Valet management:-

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

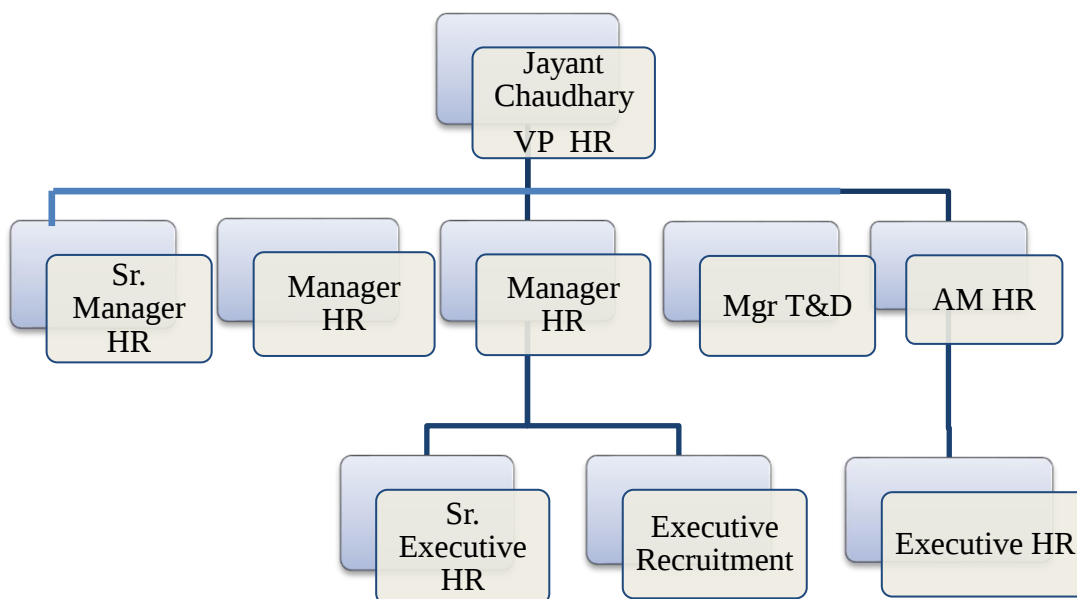
HUMAN RESOURCE MANAGEMENT

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

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

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

HR Structure



INTERNATIONAL PATIENT SERVICES (IPS) DEPARTMENT

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

Contact Procedure:

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

Also, another contact procedure is as follows:

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

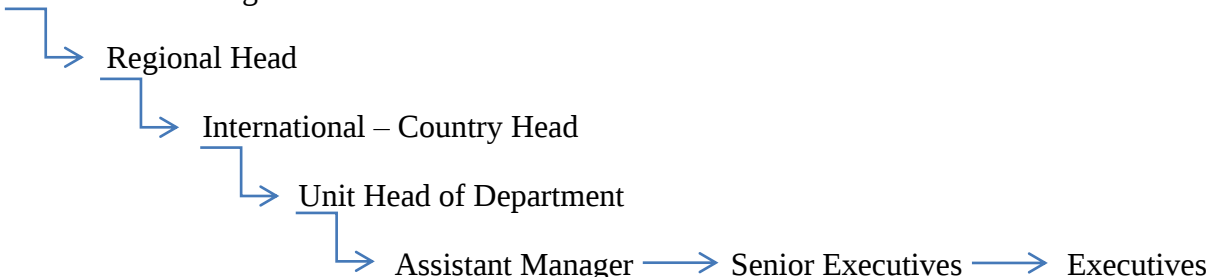
International patients avail treatment in India mainly because these facilities or treatments are not available in their respective countries, and are available at a much cheaper price in India than other countries such as US, UK or European countries. The countries from where patients come to seek treatment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

The hospital provides:

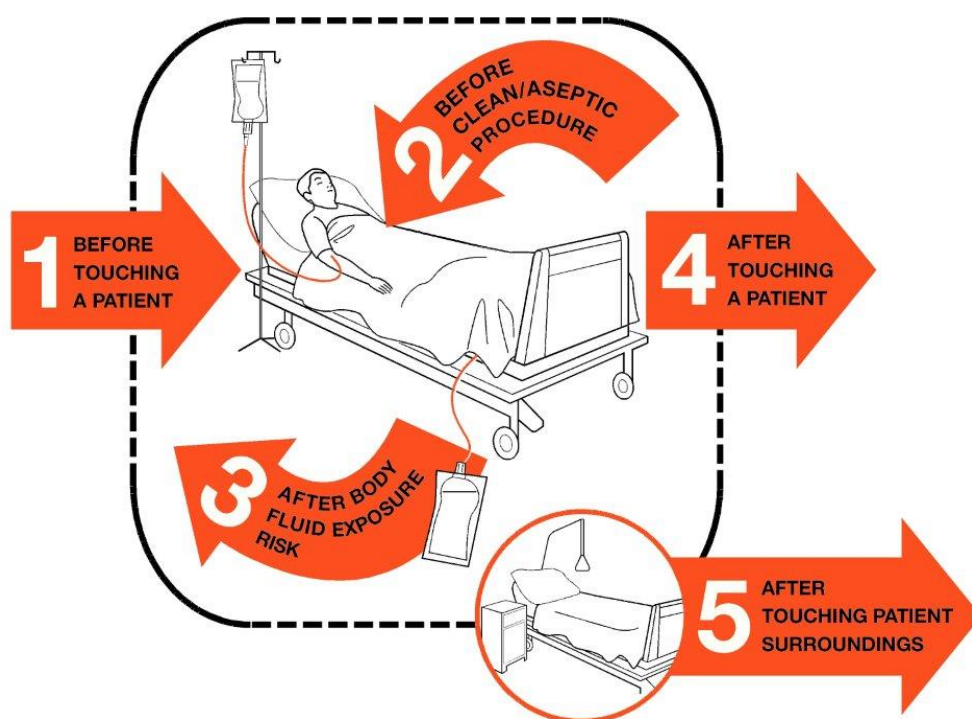
- Various Regional Translators such as Arabic, Persian, Iraqi, Bangladeshi and Russian (In house interpreter).
- Assistance in ground transportation such as finding a shuttle, hiring a car or choosing any other mode of transportation within the city.
- Relationship Managers, who closely work with over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

Staffing:

Director Marketing



Your 5 Moments for Hand Hygiene



1	BEFORE TOUCHING A PATIENT	WHEN?	Clean your hands before touching a patient when approaching him/her.
		WHY?	To protect the patient against harmful germs carried on your hands.
2	BEFORE CLEAN/ASEPTIC PROCEDURE	WHEN?	Clean your hands immediately before performing a clean/aseptic procedure.
		WHY?	To protect the patient against harmful germs, including the patient's own, from entering his/her body.
3	AFTER BODY FLUID EXPOSURE RISK	WHEN?	Clean your hands immediately after an exposure risk to body fluids (and after glove removal).
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
4	AFTER TOUCHING A PATIENT	WHEN?	Clean your hands after touching a patient and her/his immediate surroundings, when leaving the patient's side.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.
5	AFTER TOUCHING PATIENT SURROUNDINGS	WHEN?	Clean your hands after touching any object or furniture in the patient's immediate surroundings, when leaving – even if the patient has not been touched.
		WHY?	To protect yourself and the health-care environment from harmful patient germs.



World Health Organization

Patient Safety

A World Alliance for Safer Health Care

SAVE LIVES

Clean Your Hands

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WHO acknowledges the Hôpitaux Universitaires de Genève (HUG), in particular the members of the Infection Control Programme, for their active participation in developing this material.

May 2009

How to Handwash?

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

 Duration of the handwash (steps 2-7): 15-20 seconds

 Duration of the entire procedure: 40-60 seconds



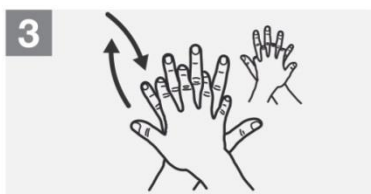
Wet hands with water;



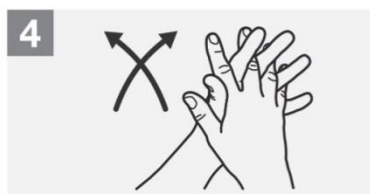
Apply enough soap to cover all hand surfaces;



Rub hands palm to palm;



Right palm over left dorsum with interlaced fingers and vice versa;



Palm to palm with fingers interlaced;



Backs of fingers to opposing palms with fingers interlocked;



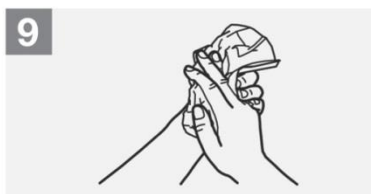
Rotational rubbing of left thumb clasped in right palm and vice versa;



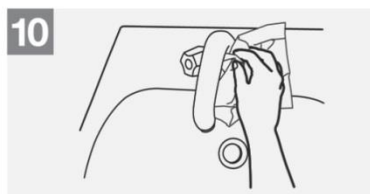
Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



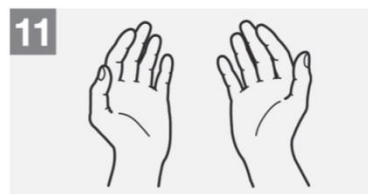
Rinse hands with water;



Dry hands thoroughly with a single use towel;



Use towel to turn off faucet;



Your hands are now safe.



World Health
Organization

Patient Safety

A World Alliance for Safer Health Care

SAVE LIVES

Clean Your Hands



**A STUDY ON HEALTH CARE ASSOCIATED
INFECTIONS MANAGMENT IN AN ICU**

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 2014-2016.

I would like to state that I have carried out my Internship on the topic “A study on Health care Associated Infections Management in ICU’s” under the guidance of Dr. Sandeep Mor (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.Sahil Thakur

IIHMR University

(2014-2016)

ACKNOWLEDGMENT

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

I have had the privilege to get know many people that generously shared their experiences and knowledge with me. I would like to take this opportunity to express my gratitude to all of them.

I wish to express my deep gratitude and regard to Dr. Sandeep Mor, DMS (Deputy Medical Superintendent) at Max Super Specialty Hospital, Saket, New Delhi, who in spite of being extraordinarily busy with his duties, took time to hear, guide and keep me focused by giving helpful advice, constructive comments and encouragement throughout the project. His valuable inputs made this project possible.

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

Dr. Sahil Thakur


Dr. Sandeep Mor
DMS (Deputy Medical Superintendent)
Max Super Specialty Hospital, Saket,
New Delhi

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INTRODUCTION

Patients in intensive care units (ICUs) have a higher risk of acquiring Health care associated infections (HAIs) as compared to those in non-critical care areas. ICU-acquired infection rate is five to ten times higher than hospital-acquired infection rates in general ward patients. Considerable increased mortality, morbidity and major costs are associated with ICU-acquired infections. This results from the acute severity of illness of Intensive Care Unit patients, prolonged hospital stay, immune-suppression, increased use of antimicrobials and frequent exposure to therapeutic procedures like endotracheal intubation with mechanical ventilation, nasotracheal intubation, intravenous lines, central venous lines and urinary catheterization. The most common Health Care Associated Infections (HCAIs) in Intensive Care Unit patients are respiratory tract infections (RTIs), urinary tract infections (UTIs) and bloodstream infections (BSIs) and are most often associated with the use of invasive devices. The Intensive Care unit are an area of considerable antibiotic use in which antibiotic-resistant organisms are prevalent. Their prevalence and rates of resistance can vary enormously depending on geographic location as well as location among ICU types. For proper management of ICU-infections, it is important to have updated knowledge about prevalence of the causative agents and their antimicrobial susceptibility patterns in institution-specific Intensive Care Unit and updating with the latest technology for the management of nosocomial infections. The study aims to review the knowledge among the staff at max hospital about the nosocomial infection and policies followed to encounter them and measures that can be taken to attain minimum level of Health care associated Infections.

Types of Health Care Associated Infections

The four most common types of nosocomial infections are urinary infections, surgical site infection, nosocomial pneumonia, and blood stream infections. Urinary infections are by far the most common. Eighty percent of these infections are associated with the use of an indwelling catheter. They are associated with less morbidity than other infections but can sometimes lead to septicemia and death. Surgical infections are also frequent with an incidence varying from 0.5% to 15% depending on the type of surgery and the underlying patient status. A surgical infection is indicated by the presence of purulent discharge around the wound or the insertion site of a drain, or by the presence of cellulites which is emanating from the wound. Patients usually acquire the infection during the procedure itself, either endogenously from flora on the skin or in the operative site, exogenously from air, medical equipment, doctors, or other staff, or rarely, from blood given during the procedure. The extent of contamination during the surgery is the main risk factor. Contamination varies with the length of the procedure and the patient's general condition.

Nosocomial pneumonia is also a significant problem. About 3% of patients on ventilators acquire pneumonia, which in this circumstance, has a very high case-fatality rate. The source of the microorganism is

often endogenous but may also be exogenous with transfer of an organism from the respiratory equipment. In one example of successful reduction of ventilator-associated pneumonia (VAP), the Owensboro Medical Health System was able to reduce their rate of VAP in the ICU to zero for eight months. They implemented the Ventilator Bundle, a series of interventions related to ventilator care. The main interventions include elevation of the head of the bed, assessment of the readiness for extubation, daily “sedation” vacations, peptic ulcer prophylaxis, and deep venous thrombosis prophylaxis. The Owensboro team particularly noted the importance of elevating the head of the bed, citing an observed association of inability to elevate the head of the bed due to clinical condition and VAP. The team also noted the importance of getting “buy-in” from the nursing staff, making changes as easy as possible for the nursing staff, teaching new staff members the importance of the ventilator bundle, identifying a physician champion of the intervention, and remembering that cultural changes take time. Besides ventilator-associated pneumonia, there are also problems with viral bronchiolitis in children’s units and influenza with secondary bacterial pneumonia in institutions for the elderly.

REVIEW OF LITERATURE

The World Health Organization offers several definitions of a nosocomial infection/ healthcare –associated infection:

An infection acquired in a hospital by a patient who was admitted for a reason other than that infection / an infection occurring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility.

As a general timeline, infections occurring more than 48 hours after admission are usually considered nosocomial. Nosocomial infections are also divided into two classes, endemic or epidemic. Most are endemic, meaning that they are at the level of usual occurrence within the setting. Epidemic infections occur when there is an unusual increase in infection above baseline for a specific infection or organism.

Nosocomial infections occur worldwide, both in the developed and developing world. They are a significant burden to patients and public health. They are a major cause of death and increased morbidity in hospitalized patients. They may cause increased functional disability and emotional stress and may lead to conditions that reduce quality of life. Not only do they affect the general health of patients, but they add a huge burden financially. The greatest contributors are costs due to increased stays of patients with nosocomial infections. The increased length of stay varies from 3 days for gynecological procedures to 19.8 days for orthopaedic procedures. Other costs include additional drugs, the need for isolation, and the use of additional studies. There are also indirect costs due to loss of work.

Nosocomial infections are most frequently infections of the urinary tract, surgical wounds, and the lower respiratory tract. A World Health Organization prevalence study and other studies have shown that these infections most commonly occur in intensive care units and in acute surgical and orthopaedic wards. Infection rates are also higher in patients with increased susceptibility due to old age, underlying disease, or chemotherapy.

Patients are exposed to a variety of microorganisms during a hospital stay, but contact between a patient and an organism does not necessarily guarantee infection. Other factors influence the nature and frequency of infections. Organisms vary in resistance to antimicrobials and in intrinsic virulence. Bacteria, viruses, fungi, and parasites can all cause nosocomial infections. There are multiple ways of acquiring such an organism. The organisms can be transferred from one patient to another (cross-infection). They can be part of a patient's own flora (endogenous infection). They can be transferred from an inanimate object or from a substance recently contaminated by another human source (environmental transfer).

The organisms that cause nosocomial infections are often drug-resistant. The regular use of antimicrobials for treatment therapy or prophylaxis promotes the development of resistance. Through

antimicrobial-driven selection and the exchange of genetic resistance elements, multi-drug resistant strains of bacteria emerge. Antimicrobial-sensitive microorganisms that are part of the endogenous flora are suppressed, while the resistant strains survive. Many strains of pneumococci, staphylococci, enterococci, and tuberculosis are currently resistant to most or all antimicrobials which were once effective.

In high-income countries, approximately 30% of patients in intensive care Units (ICU) are affected by at least one health care-associated infection.

In low- and middle-income countries the frequency of ICU-acquired infection is at least 2-3 fold higher than in high-income countries; device-associated Infection densities are up to 13 times higher than in the USA.

Newborns are at higher risk of acquiring health care-associated infection in Developing countries, with infection rates three to 20 times higher than in High-income countries.

Methods of Acquisition

Bacteria that cause nosocomial infections can be acquired in several ways. Endogenous infections can develop from the endogenous or transient flora of the patient. When bacteria present in the normal flora are transmitted to sites outside of their normal environment like the urinary tract, they can cause infection. Infection can also occur with tissue damage (wound) or with inappropriate antibiotic therapy that allows overgrowth of endogenous bacteria like *C. difficile*. Exogenous cross-infection can occur with transfer of an organism from one patient or member of the staff to another patient or member of staff. The WHO guide summarizes this idea with the following statement:

Bacteria are transmitted between patients: (a) through direct contact between patients hands, saliva droplets or other body fluids), (b) in the air (droplets or dust contaminated by a patient's bacteria), (c) via staff contaminated through patient care (hands, clothes, nose and throat) who become transient or permanent carriers, subsequently transmitting bacteria to other patients by direct contact during care, (d) via objects contaminated by the patient (including equipment), the staff's hands, visitors or other environmental sources (e.g. water, other fluids, food).

A final route of acquisition is through flora from the healthcare environment. Certain microorganisms do well in the hospital environment. They may live in water, in damp areas, in sterile products or disinfectants (*Pseudomonas*, *Acinetobacter*, *Mycobacterium*), in linens, in food, in fine dust and droplet nuclei, and in equipment and supplies used in care.

People are central to all of these routes of transmission. They are the main reservoir and source for microorganisms. They are the main transmitters of organisms, and they are the receptors of organisms, in consequence becoming new reservoirs.

Some strains of methicillin-resistant *Staphylococcus aureus* are particularly capable of causing nosocomial infections. These strains are often resistant to multiple antibiotics and sometimes are only sensitive to vancomycin and teicoplanin. Infections caused by MRSA are similar to those caused by methicillin sensitive strains (wound infections, lower respiratory and urinary tract infections, septicemia, infections of sites for invasive devices, pressures sores, burns and ulcers. MRSA has the potential for epidemic spread, regionally and nationally. Vancomycin resistant enterococci are also known causes of nosocomial infections.

The Societal Impact of Healthcare associated Infections

One study estimates that bloodstream nosocomial infections are the eighth leading cause of death, assuming a nosocomial infection rate of 5%, of which 10% are bloodstream infections, and an attributable mortality rate of 15%. In absolute numbers, if the overall attack rate was 5%, and 25 million patients were admitted each year, 1.75 million people would acquire nosocomial infections each year. If 10% of these were bloodstream infections, 175,000 would get these serious infections each year. If the attributable mortality rate of nosocomial infections is 20% and the infection rate is 5%, an estimated 350,000 life years would be lost annually. Another source reports an incidence of 2 million new cases of nosocomial infections per year, leading to an estimated 20,000 deaths per year. They also estimate that nosocomial infections more than double the mortality and morbidity risks of any patient admitted to a hospital. The costs to society can also be studied in terms of dollars spent. Assuming an incidence of 2 million nosocomial infections per year, the estimated added expenditure is in excess of \$2,000,000,000 per year. One study showed that length of stay for a patient with a *Staphylococcus aureus* infection was increased by nearly three times the average length of stay for any other type of hospitalization. This increased length of stay also means increased costs. Treating amethicillin-resistant *Staphylococcus aureus* (MRSA) infection costs 6-10% more than treating a *S. aureus* infection that is sensitive to methicillin (MSSA). Patients with MRSA infections also have a higher attributable death rate than MSSA patients. These statistics support the argument for increasing efforts to reduce the incidence of hospital-acquired infections so that the associated societal costs will also be reduced.

As a public health problem, nosocomial infections will become increasingly important in the future. Crowding and population size are increasing, and impaired immunity is becoming more frequent. New microorganisms will develop, and existing microorganism will develop even greater resistance.

Specific Infection Control Measures

Besides the committees and other leaders in infection control, much of infection control lies in the hands of the personnel in direct contact with the sick patient. These healthcare employees must understand specific guidelines in prevention of infection transmission through isolation and other good healthcare habits. Much of this information is disseminated through training and educational programs given by the infection control departments. Examples of guidelines that are essential for the healthcare worker are specified as:

Hand Washing

Though simple, this measure is one of the most effective methods in prevention of the spread of infection. Depending on the type of care being provided there is a different hand-washing protocol indicated. For example, with routine care in the hospital, healthcare workers can wash with a non-antiseptic soap or to disinfect the hand by rubbing with an alcohol solution. However, when caring for patients who are already suffering infection, hands must be washed with antiseptic soap for at least one minute or hands can be disinfected by rubbing with alcohol solution. Finally, in the surgical setting, the hand and forearm must be washed with an antiseptic soap for 3 to 5 minutes or simple hand washing with the addition of disinfection by rubbing on alcohol.

Hygiene and Uniform

Healthcare workers must also be conscious of their personal hygiene and what they wear to work as it could help spread infection within the hospital. For example, employees must have good personal hygiene, maintain short and clean nails, and keep hair worn short or pinned up. Also, employees should wear a uniform that is covered by a white coat and must obey special uniform rules in setting such as burn or intensive care units. Clothing must also be easy to decontaminate and cleaned daily to keep at optimum conditions. It is important that with any exposure to a possible pathogen, clothing should be changed as soon as possible. Shoes are another measure of safety in the healthcare system. Staff should wear shoes that are dedicated to the particular unit and make sure that the shoes have been cleaned.

Barriers: Caps, Masks, Gloves

Another important group of precautions to prevent the spread of infection is the use of barriers such as caps, masks, and gloves. In general, caps are suggested when in aseptic units, operating rooms, or when performing other invasive procedures. Masks that are made of synthetic material that can filter the air are considered good barriers against microorganisms. Masks made of other material such as wool, gauze, or paper is not considered effective. The use of masks is indicated for many situations and is present for both the protection of the patient and the healthcare worker. Gloves are another set of necessary barrier when working with

patients with a communicable disease. Staff should wear non-sterile gloves when caring for this type of patient while working in surgery or immuno-compromised patients, gloves used should be sterile. Again, gloves are used for protection of both the patient and healthcare provider.

Injection Practices

Transmission of blood borne pathogens is often the result of unsafe injection methods. It is recommended that all staff is aware that they should decrease unnecessary injections, to always use a sterile needle and syringe, and to dispose of the used needle and syringe in an appropriate manner, i.e. the use of a sharps container and biohazard disposals.

Equipment Safety

Another common mode of transmission of infection is through equipment and environmental causes. Though it may appeal to common sense, it is necessary that the hospital environment is thoroughly cleaned often. The hospital can be divided into four zones where different cleaning procedures can be followed. In zone A, there are no patients in this area and normal cleaning can be used. In zone B, patients are present but do not have an infection nor are susceptible to infection. Zone B should be cleaned in a manner that does not raise dust and a detergent solution may be used to improve the cleaning. In zone C, patients are infected and isolated and in zone D, patients are often highly susceptible to infection and are isolated. These areas must be cleaned with a detergent or antiseptic solution and different cleaning equipment must be used for different rooms. Another important way to keep the equipment and environment safe is to disinfect through the use of other compounds than those used for cleaning. These compounds are usually non-volatile, remain safe for the patient and staff, and should be effective for a short time frame. Disinfection can be categorized as high, intermediate, or low. Under high-level disinfection, all microorganisms should be eliminated with the exception of heavy bacterial spore counts. Under intermediate disinfection, most bacteria and viruses are killed but not all spores are killed. Finally, in low-level disinfection, only some microorganisms are killed with some more resistant species escaping destruction. One last way to ensure equipment safety is sterilization, which is destruction of all microorganisms. Sterilization can be achieved through both mechanical and chemical processes. While equipment and device disinfection and sterilization are critical, it is also crucial that all personnel are trained properly in the use of the equipment and device and know contacts for any malfunctions in such equipment.

Isolation

While all of the infection control methods deal with physical objects, isolation of the patient also plays a critical role in infection control. The isolation of an infected patient can often prevent the spread of disease

and also protect the patient from acquisition of other infections. Isolation policy may vary slightly between hospitals but patient are usually evaluated before being placed under isolation.

Surveillance and Infection Control

Surveillance has been instituted for many years since the rise of nosocomial infections in the United States. A majority of hospitals have their own surveillance systems and some hospitals voluntarily report their findings to the CDC and the NNIS report is written to give other hospitals an idea of how well their infection control systems are working.

RATIONALE

This report is indented to find out the various nosocomial infections encountered in ICU's in Max Saket Super Speciality Hospital, Saket as Nosocomial infections is one of the major contributing factors that adds to the cost of patients and major cause of mortality and mortality in patients leading to increase in average length of stay and adds to cost in maintenance for the hospital as well. Reducing the nosocomial infection in ICU's can lead to increase in significantly enhancing the hospital's image.

Establishing a standard protocol procedure for controlling the nosocomial infections in ICU's will help in promoting efficiency amongst the employees and helps in establishing a significant position of the hospital amongst competitors.

OBJECTIVES

1. To observe and analyze the various infection control practices followed at Max Super Specialty Hospital, Saket.
2. To search for areas of problem and find reasons for the same.
3. To give recommendations for further improvement in infection control practices and minimize Healthcare acquired infections (HAIs).

METHODOLOGY

- **Type of study** : Descriptive cross-sectional
- **Study population** : Doctors, Nurses, Infection Control Nurses IN ICU'S at Max Super Speciality Hospital, Saket, Delhi
- **Study area** - All ICU's at Max Hospital, East & West wing, Saket, Delhi
- **Duration of Study** - 4 weeks
- **Type of Data** - Quantitative& Qualitative
- **Technique** – Direct Observation of Operations & Unstructured Questionnaire & Interviews
- **Tool** – Questionnaire
- **Sample size** - 65
- **Sampling technique**- Non probability sampling
- **Inclusion criteria**-
 - Doctor's & Nurses practising in ICU's at Max Hospital, East & West wing, Saket.
 - Standard Protocols Followed by Doctors and Nurses and assigned Infection Control Nurses at Max Saket Hospital.
- **Exclusion criteria**-
 - Doctors and Nurses working in rest area of the Hospital.
- **Data collection** - Primary and Quantitative (3 weeks)
- **Data entry**- Manually
- **Data Analysis**- Using bar charts, pie charts

OBSERVATIONS AND FINDINGS

HOSPITAL INFECTION CONTROL

1. The organization has a well-designed, comprehensive and documented infection control programme aimed at reducing/eliminating risks to patients and their attendants, visitors and the health care providers:

- a) Currently there is a hospital infection control committee on infection control the meeting of which is held every month.
- b) There is a documented infection control programme.
- c) There is an infection control task force which is involved in surveillance activities.
- d) There are designated infection control nurses.

2. The organization has an infection control manual which is periodically updated:

- a) There is infection control manual. It has all policies and procedures related to infection control activities in the hospital and identify high risk areas in the same.
- b) Even though surveillance activities like swab culture is done in various areas like OT & ICU there is a need of strengthening the surveillance activities by including rounds, air and water quality checks in high risk areas like CSSD & kitchen.
- c) Policies and procedures related to CSSD activities must be prepared and included in the manual.

3. The infection control task force is responsible for surveillance activities in identified areas of the hospital

- a) There is data collected on surveillance activities. The infection control nurse maintains the surveillance data on infection control.
- b) This is being uniformly done. Information is sent to appropriate authorities.
- d) Monitoring the effectiveness of housekeeping services (infection control) is being done.

4. The organization takes actions to prevent reduce the risk of HealthCare Associated Infections (HCAI's) in patients and employees.

5. Proper facilities and adequate resources are provided to support the infection control programme

- a) Hand washing facility is adequate. Scrubs are provided with elbow/foot operating tap. Also drier/tissue papers are provided. Hand washing pictures are displayed. Also hand washing areas are kept clean.
- b) Hand washing should are monitored regularly.

c) Policies and procedures on isolation and barrier are available. Staffs are aware of isolation/barrier activities, who are the patients to be admitted in isolation room. Isolation rooms are available in wards. These rooms are more organized and cleaned. They are displayed “ISOLATED ROOM”.

d) Adequate gloves, masks and disinfectants are available. The usage must be monitored by infection control team.

6. The organization takes appropriate actions to control infection outbreak.

Hospital has documented procedures on handling such outbreaks. It is prepared and implemented.

7. There are documented procedures for sterilization and protocols to be followed in the intensive care units in the organization

There is an established documented procedure.

8. Statutory provisions with regard to Bio Medical Wastes (BMW) are complied with

a) The hospital is authorized by DPCC (Delhi Pollution for management and handling of bio-medical waste.

b) Biomedical waste segregation is done with the help of colour codes and instructions are properly displayed in waste segregation areas. This is displayed uniformly throughout the hospital.

c) The waste is cleared at least twice in a day. Trolleys are used with covered bins of different colour to transport waste.

d) All the wastes must be weighed before handling over to the outsourcing service.

e) Bio-medical waste treatment is outsourced which is authorized to treat biomedical waste.

9. The infection control programme is supported by the organization’s management and includes training of staffs and employee health

a) Designated infection control nurses are there.

b) Facilities like gloves, mask etc is available.

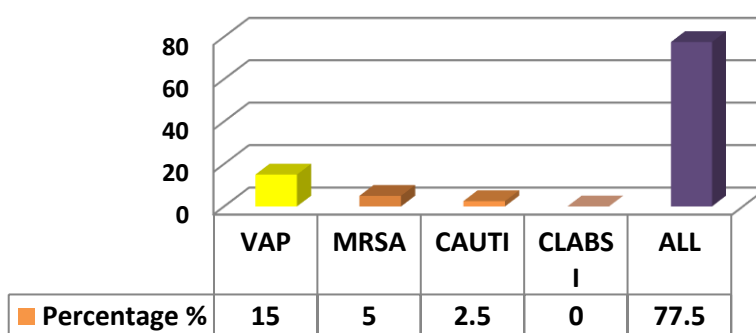
d) Soap solutions are provided in all hand washing areas instead of soap

f) Proper system of pre and post exposure prophylaxis is implemented throughout the organization. This must be applicable to all staffs working in the organization including outsourced services.

DATA ANALYSIS

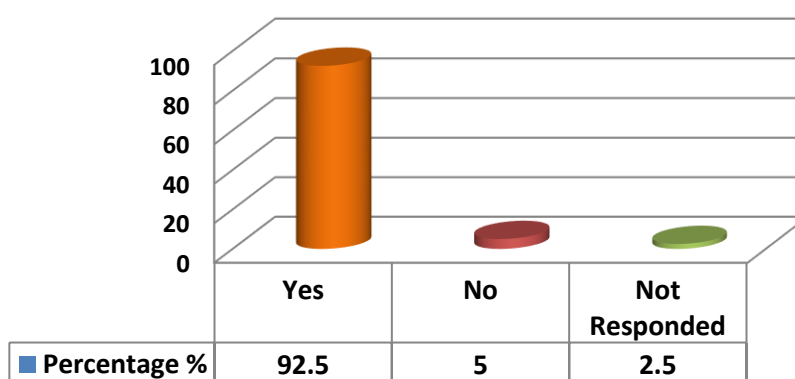
NURSE Analysis

Fig 1. Occurrence of Nosocomial Infection



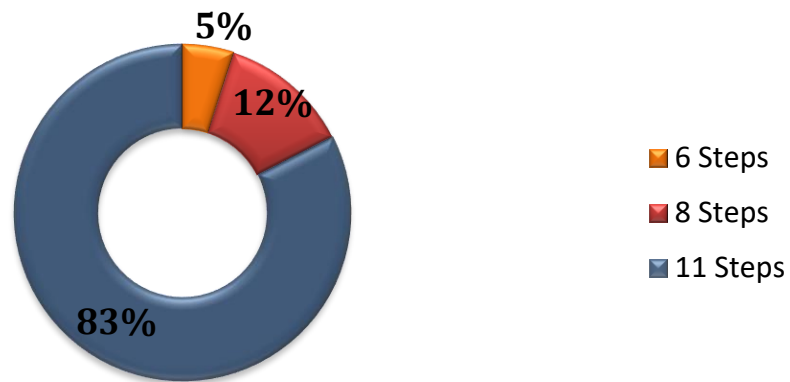
INFERENCE: The figure reveals that 2/3 rd(77.5%) of the Nurses agreed that all the nosocomial infections such as Ventilator Associated Pneumonia (VAP), Methicillin Resistant Staphylococcus aureus (MRSA), Catheter Associated Urinary Tract Infection (CAUTI), Centre Line Associated Blood Stream Infections (CLABSI) occur at Max Saket,

Fig 2.Awareness Regarding Policy For Nosocomial Infection



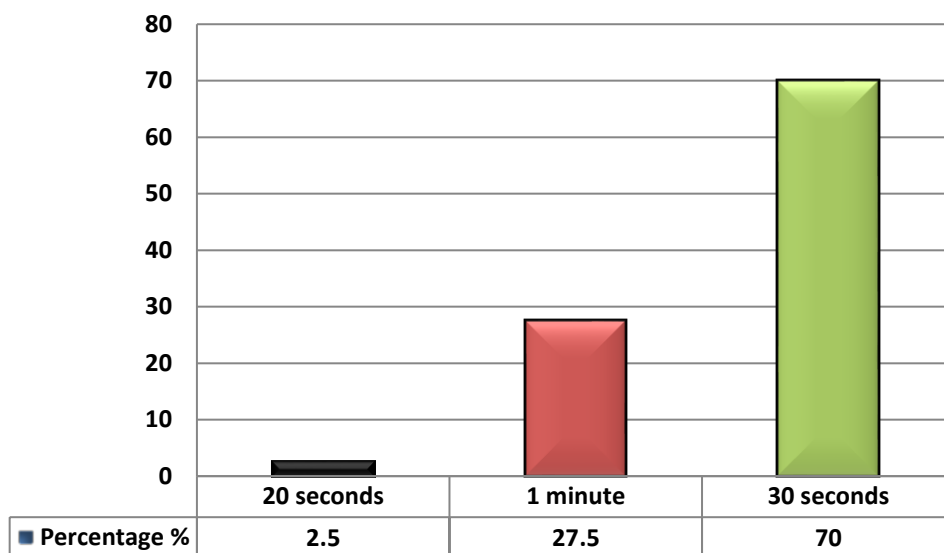
INFERENCE: The figure depicts that **92.5%** of the Intensive Care Units are aware about the policy regarding Nosocomial Infection in the Hospital.

Fig 3. Awareness Regarding Steps in Hand Washing



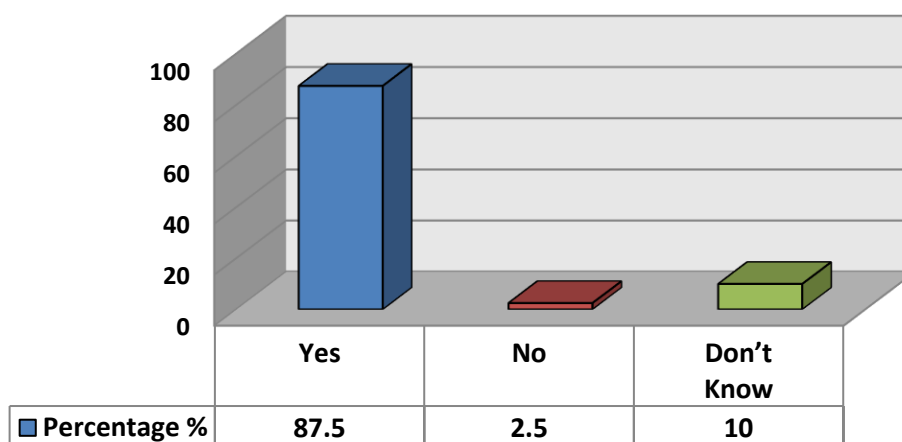
INFERENCE: The figure clearly shows that **83%** of the Intensive Care Unit Nurses are aware of the 11 steps followed in Hand Washing Practices. **12%** Nurses feel there are 8 steps followed by 5% who feel there are 6 steps..

Fig 4. Ideal Time for Hand Washing



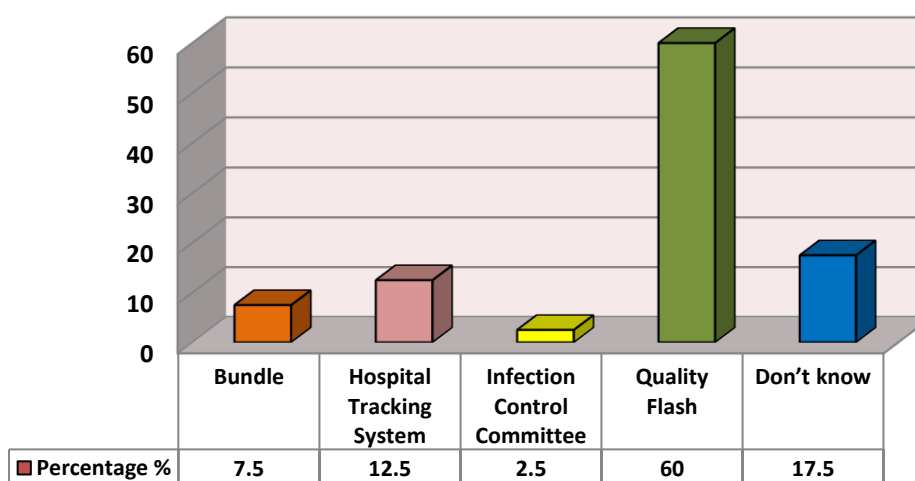
INFERENCE: The figure clearly depicts that **27%** of the Intensive Care Unit Nurses knew about the ideal time followed by **70%** who feel 30 seconds to be the ideal time.

Fig 5. Awareness of Surveillance System for Nosocomial Infection



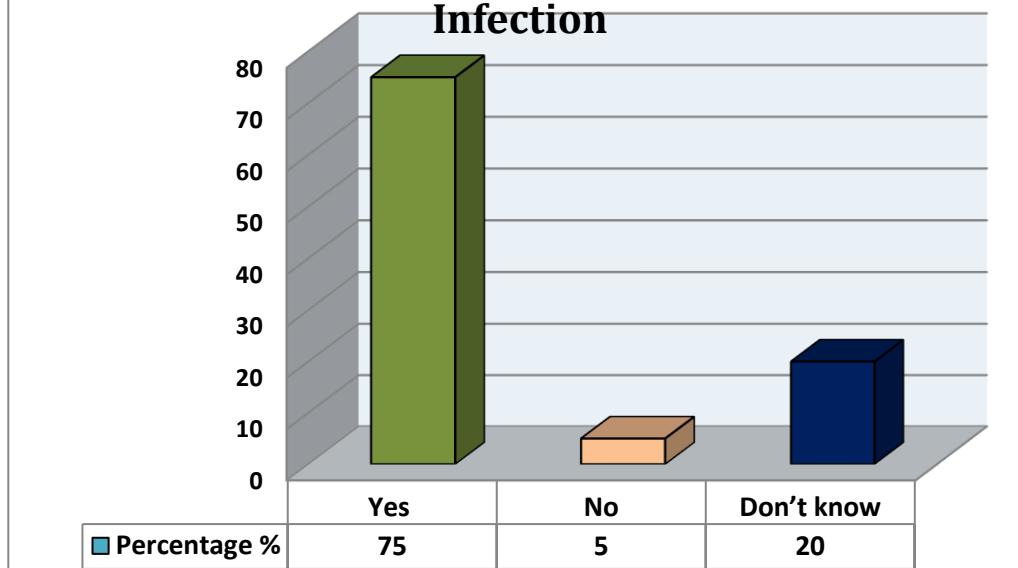
INFERENCE: The Figure clearly shows that 87.5% of the Intensive Care Unit Nurses were aware about the surveillance system for nosocomial infections that monitors the incidence of nosocomial infections.

Fig 6. Name of the Surveillance System



INFERENCE: The figure clearly shows that only 60% of the Intensive Care Unit Nurses were aware about the Quality Flash that is maintained by Max Saket Hospital.

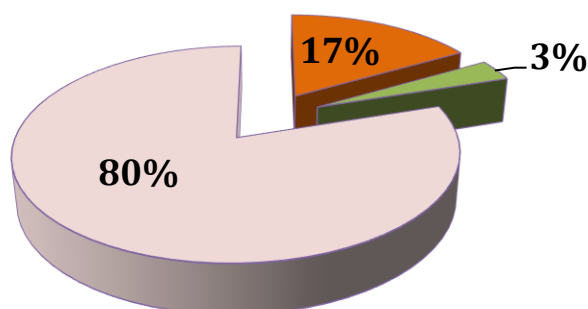
Fig 7. Nurses Training For Nosocomial Infection



INFERENCE: The figure clearly reveals that 2/3rd (75%) of the Intensive Care Unit Nurses agreed that they receive training for nosocomial infection.

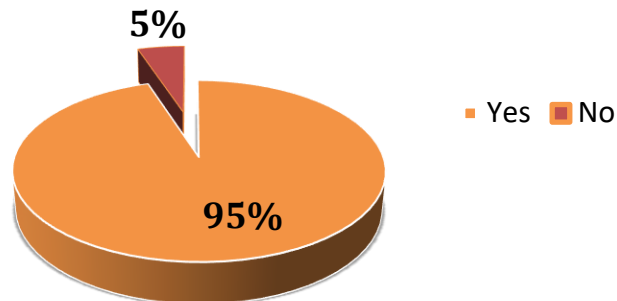
Fig 8. Frequency of Staff Training

Twice a Week Don't know Once a Month



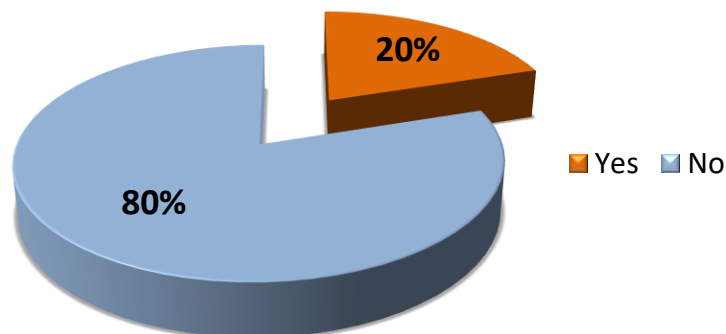
INFERENCE: The figure clearly shows that 80% of the Intensive Care Unit Nurses said that they receive training for nosocomial infection once a month.

Fig 9. Use of Personal Protective Equipment (PPE)



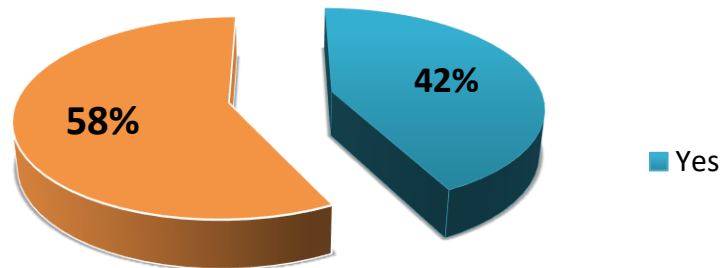
INFERENCE: The figure clearly shows that almost all the Intensive Care Unit Nurses use Personal Protective Equipment while attending Nosocomial Patients.

Fig 10. Wearing gloves eliminates Hand Washing



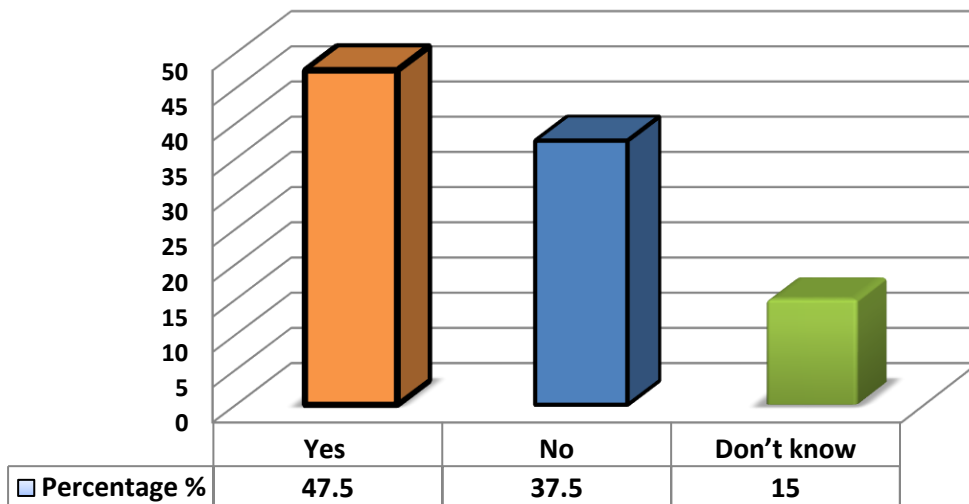
INFERENCE: The figure clearly shows that 20% of the Intensive Care Unit Nurses feel that if they wear gloves they do not need to wash hands and they will be safe from getting infected from nosocomial infections.

Fig 11. Patient Burden Hamper Hand Washing Practices



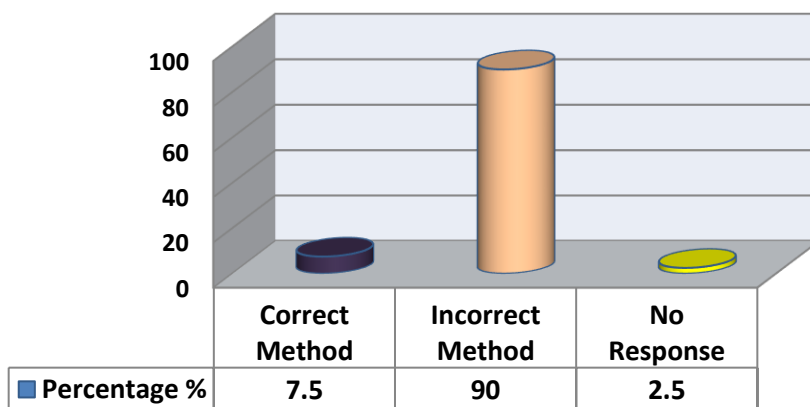
INFERENCE: The figure shows that 43% of the Intensive Care Unit Nurses believe that they are overburdened with patients and this hampers their Hand washing practices.

Fig 12. Regular Check-ups for Nurses Coming in Contact with Infected Patients



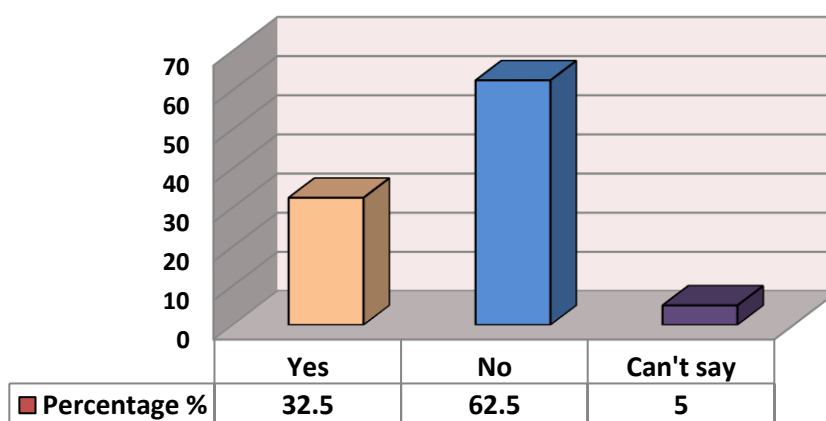
INFERENCE: The figure clearly reveals that 47.5% of the Intensive Care Unit Nurses said that they had regular checks ups after providing care to the infected patient whereas 57.5% nurses disagreed.

Fig 13. Standard Protocol of Wearing (Mask, Gloves, Apron, Head Cap)



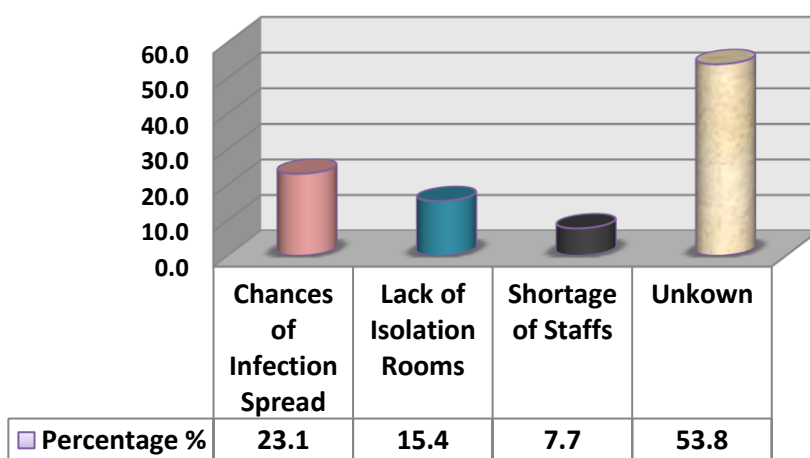
INFERENCE: The figure clearly shows us that Only 7.5% of the Intensive Care Unit Nurses knew about the standard protocol of wearing the Mask, Gloves, Apron & Head Cap and 90% nurses were unaware of the Standard Protocol.

Fig 14. Nurses feel Challenges in Treating Nosocomial Patients



INFERENCE: The figure shows that Only 32.5% of the Intensive Care Unit Nurses feels challenging while treating nosocomial patients. While 62.5% of the nurses were comfortable in treating nosocomial patients.

Fig 15. Most Encountered Challenge



INFERENCE: The Figure shows that 23.1% of the Intensive Care Unit Nurses feel the greatest challenge is the spread of infection from the patient. 15.4% of the nurses feel that there is lack of isolation rooms and 7.7% feel there is shortage of staff.

INTERPRETATION

Nurses in the Intensive Care Unit are well aware of the Nosocomial Infection existing in hospitals and the policy and surveillance regarding it but some fail to remember the surveillance system followed at Max Saket Hospital.

All the nurses have received a formal training in Hand Hygiene but very few of them were unable to recall the steps during Hand washing. Many of the nurses were able to recall the ideal time for hand washing.

Standard protocols are followed by the nurses to maintain the utmost safety of the patient and providing the best possible care to the patient but many of them fail to recall the standard protocols of wearing gloves, head cap, apron, and mask. Some feel that wearing gloves eliminates hand washing requirements and 43% of the nurses feel that overburdening of the patients hamper their Hand washing practices.

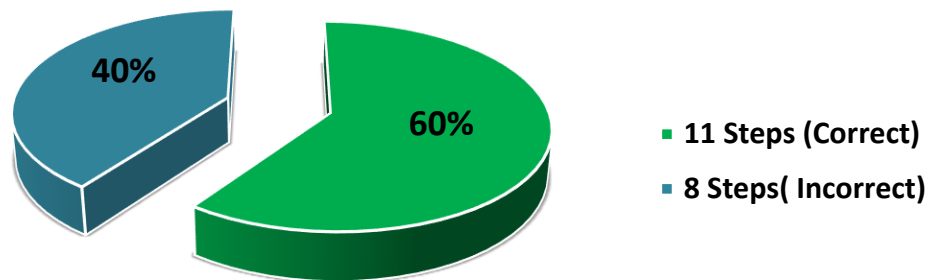
Nurses feel challenging in providing care to the nosocomial infection patient as there is fear of getting infection as mentioned by the nurses that they are not regularly screened for infections and this adds to their worry. Another challenge according to the nurses is understaffing and lack of more isolation rooms in the Intensive Care Units.

Some nurses suggested some initiatives that will help them in overcoming their challenges and providing better care facilities to the patient

- Aseptic Precautions and use Personal Protective Equipment
- Avoid staff shuffling
- Education regarding the latest trends and precautions for nosocomial infections
- Regular survey for better enlightenment
- Adhering to strict Hand Hygiene Protocols.

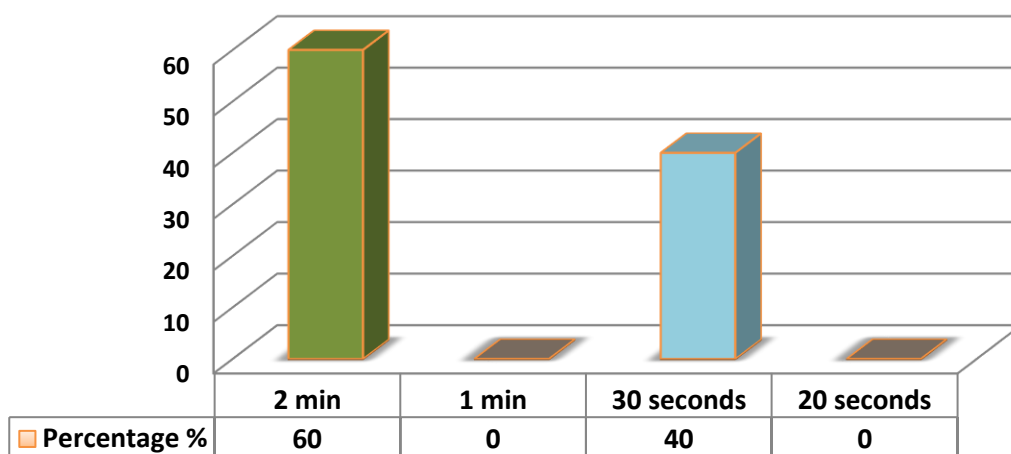
INFECTION CONTROL NURSES Analysis

Fig 16. Aware of Hand Washing Steps



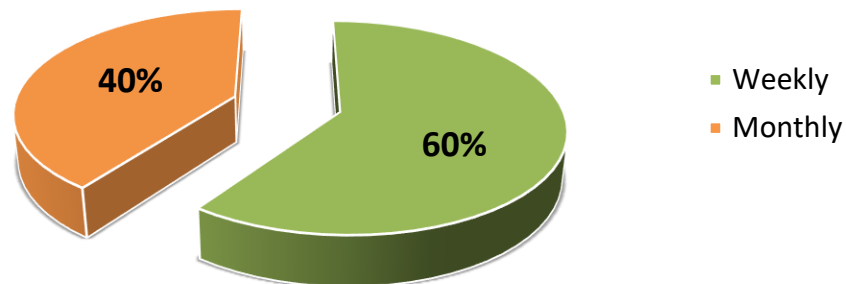
INFERENCE: The figure clearly depicts that 60% of the Infection Control Nurses knew all the 11 steps of Hand washing while 40% failed to recall all the steps.

Fig 17. Ideal Time of Hand Washing



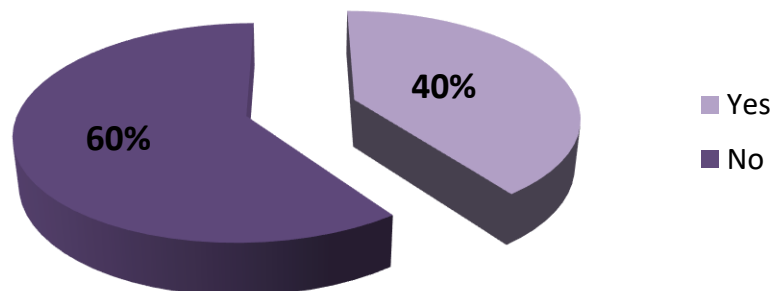
INFERENCE: The figure clearly explains us that 60% of the Infection Control mentioned 2 minutes as the ideal time for Hand washing while 30% think 30 seconds to be ideal time for Hand washing.

Fig 18. Frequency of Training for Nosocomial Infection



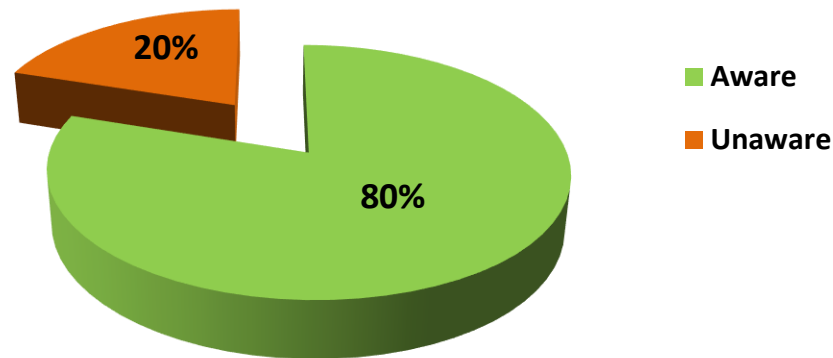
INFERENCE: The figure clearly shows that 60% of the Infection Control Nurses they receive weekly training for Nosocomial Infection Management while 40% said they receive training on monthly basis.

Fig 19. Overburdening of Patients Hamper Hand Washing Practises



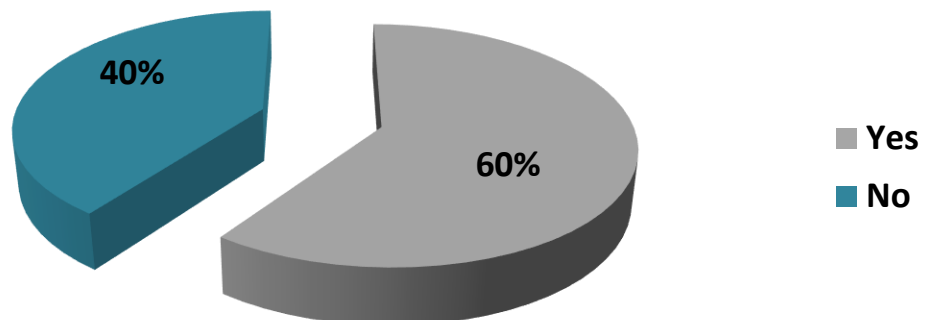
INFERENCE: The figure depicts that 60% of the Infection Control Nurses feel that their Hand washing practices are hampered due to overburdened by the patients.

Fig 20. Awareness of Standard Protocol of Wearing (Headcap, Gloves, Apron, Mask)



INFERENCE: The figure shows that Awareness regarding the Standard Protocol of Wearing (Head cap, Gloves, Apron, Mask) is 80%

Fig 21. Infection Control Nurses Working with Pharmacy for Overusage of Antibiotics



INFERENCE: The figure shows the 60% of the Infection Control Nurses work with the pharmacy for the prevention of the over usage of antibiotics.

INTERPRETATION

Infection Control Nurses are well aware of the Nosocomial Infection existing in hospitals and the policy and surveillance regarding it and maintains the record of such event on daily basis.

All the nurses have received a formal training in Hand Hygiene and were able to recall the ideal no of steps in Hand washing.

Standard protocols are followed by the nurses to maintain the utmost safety of the patient and providing the best possible care to the patient and all of the infection control nurses were able recall the standard protocols of wearing gloves, head cap, apron, and mask. The nurses are highly educated regarding that the wearing of gloves does not eliminates the hand washing practices.

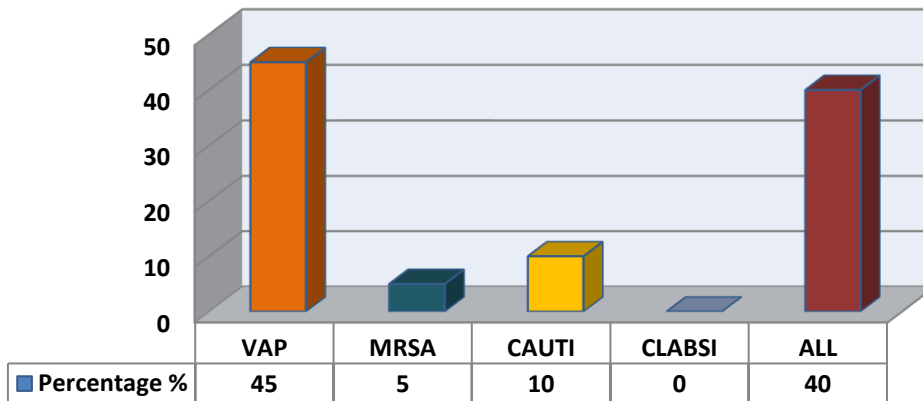
Nurses feel challenging in providing care to the nosocomial infection patient as there is shortage of staff and lack of communication with the doctors as stated by the infection control nurses that sometimes doctors are adamant and does not take the views if infection control nurses.

Some nurses suggested some initiatives that will help them in overcoming their challenges and providing better care facilities to the patient

- Adhering to strict Hand Hygiene Protocols.
- Better communication with the doctors by staff meetings.
- More staffing of Infection Control Nurses.

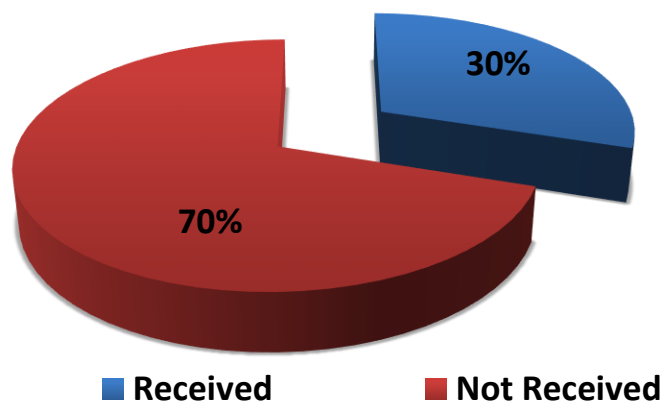
PHYSICIANS Analysis

Fig 22. Most Common Encountered Nosocomial Infection



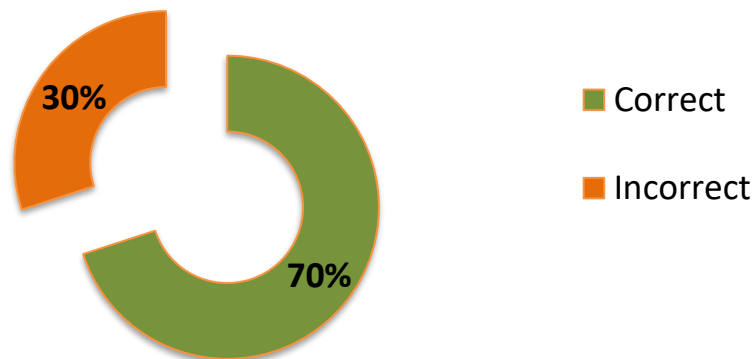
INFERENCE: The figure shows that **45%** of the Physicians from Intensive Care Units feel that the most common Nosocomial Infection In Max Saket Hospital is Ventilator Associated Pneumonia.

Fig 23. Hand Hygiene Training



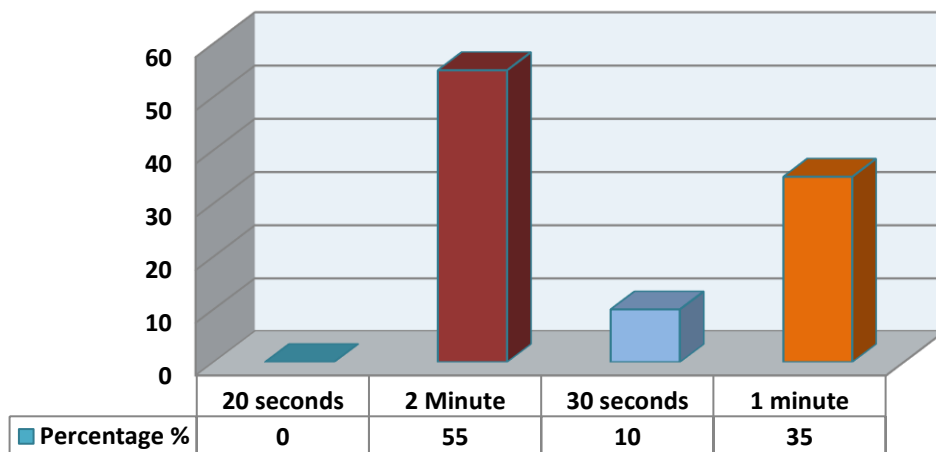
INFERENCE: The figure reveals that **70%** of the Physicians from Intensive Care Unit received a formal Hand Hygiene Training.

Fig 24. Moments in Hand Hygiene



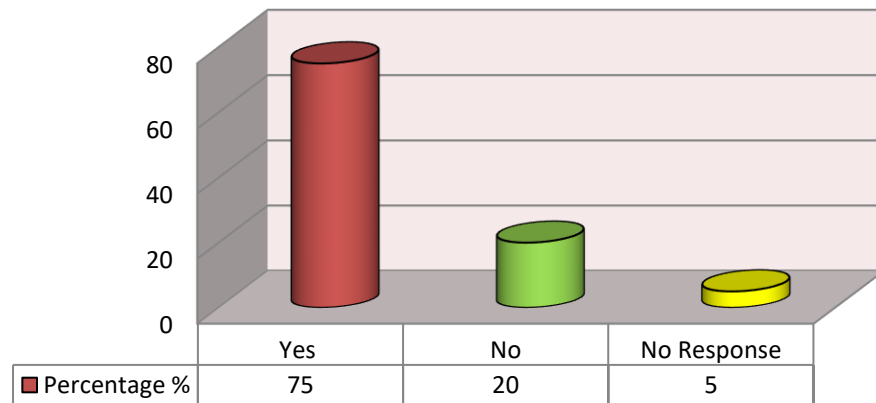
INFERENCE: The figure shows us that 70% of the Physicians from Intensive Care Unit were able to recall all the 5 Eureka Moments essential for Hand Hygiene.

Fig 25. Ideal Time for Hand Washing



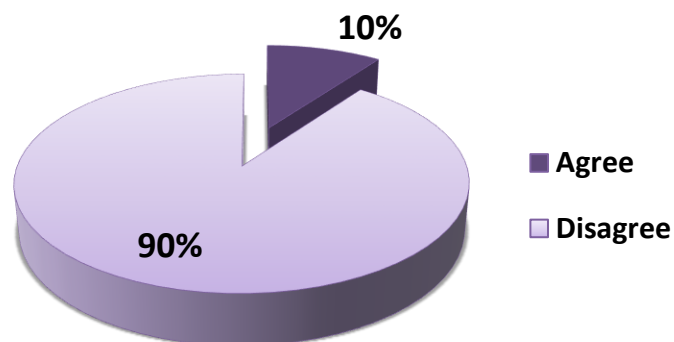
INFERENCE: The figure depicts that 55% of the Physicians from Intensive Care Unit feel that 2 minutes is the ideal time for Hand washing while 35% believe that 1 minute is the ideal time for washing hands.

**Fig 26. Using PPE
(Personal Protective Equipment)**



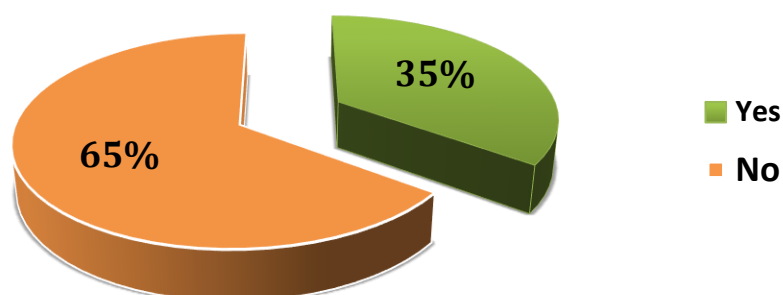
INFERENCE: The figure shows that **75%** of the Physicians from Intensive Care Unit use Personal Protective Equipment while treating Nosocomial Infected Patients.

**Fig 27. Wearing Gloves Eliminates
Hand Washing**



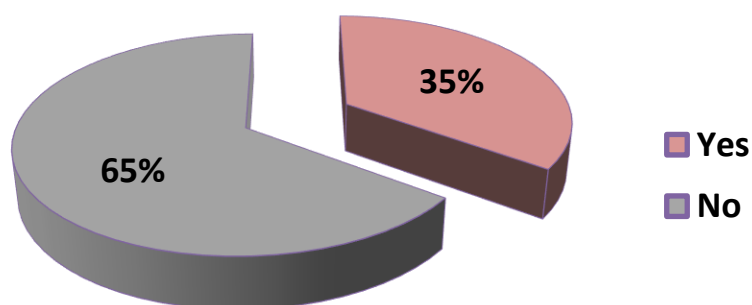
INFERENCE: The figure reveals us that **90%** of the Physicians from Intensive Care Unit disagree that wearing gloves eliminates the Hand washing requirement.

Fig 28. Overburdening Hamper Hand Washing Practises



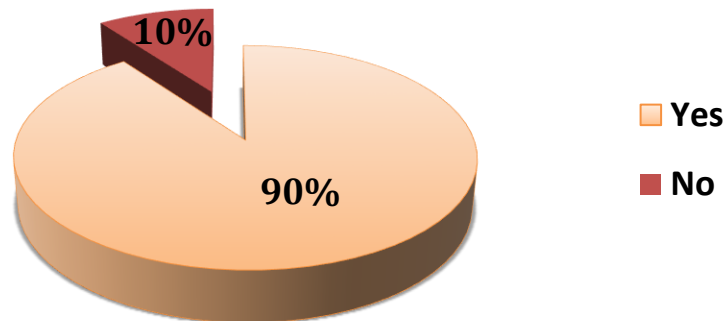
INFERENCE: The figure reveals that 35% of the Physicians from Intensive Care Unit feel overburdened by patients which hampers their Hand washing practices.

Fig 29. Physicians Checked Regularly for Nosocomial Infection



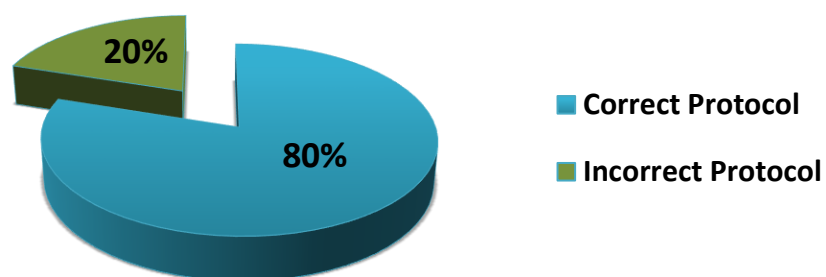
INFERENCE: The figure reveals that 65% of the Physicians from Intensive Care Unit feel that they do not have regular health checkups after treating nosocomial infection patient.

Fig 30. Colleagues following Standard Protocols of Hand Washing



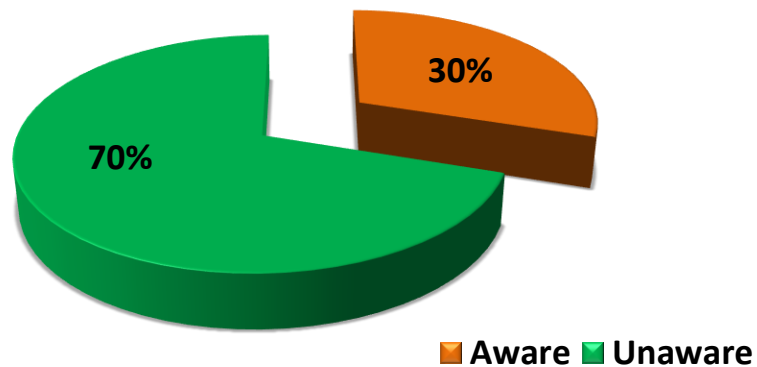
INFERENCE: The figure shows us that **10%** of the Physicians from Intensive Care Unit feel their colleagues do not follow Standard Protocols of Hand Washing.

Fig 31. Standard Protocols of Wearing (Headcap, Mask, Gloves, Apron)



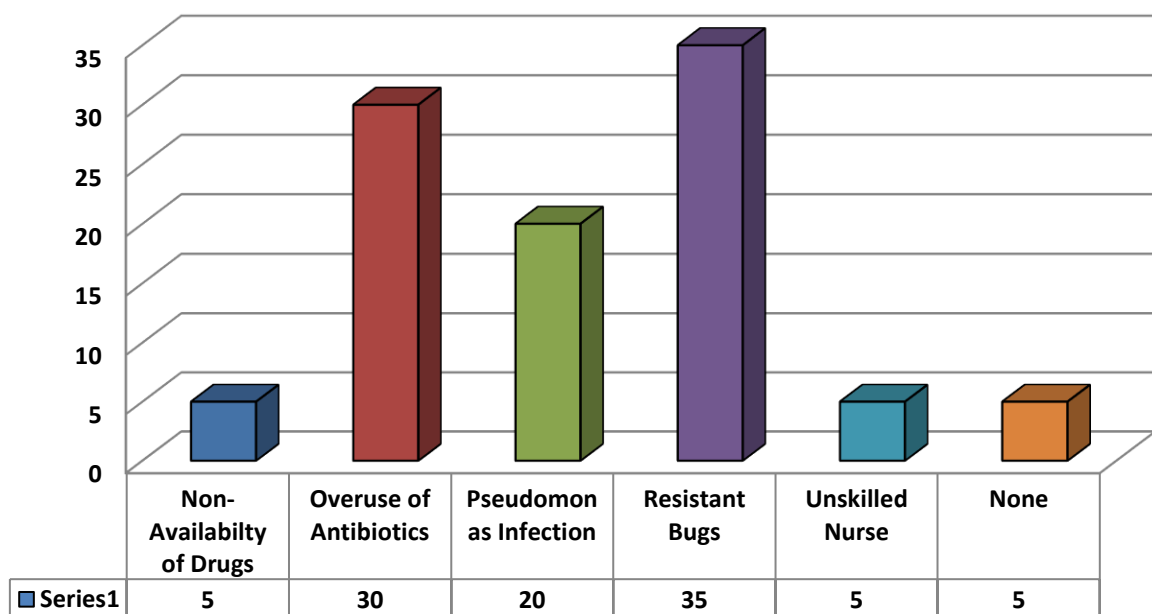
INFERENCE: The figure depicts that **80%** of the Physicians from Intensive Care Unit follow and know Standard Protocols of Wearing Head cap, Gloves, Mask & Apron.

Fig 32. Awareness Regarding Air Changes



INFERENCE: The figure shows us that **70%** of the Physicians from Intensive Care Unit were unable to recall the exact no of air changes required in the isolation rooms in the Intensive Care Units.

Fig 33. Challenges Encountered By Physicians



INFERENCE : The figure shows us that Resistant Bugs, over usage of Antibiotics and Pseudomonas are the major challenges faced by the Physicians in the Intensive Care Units.

INTERPRETATION

Physicians at Intensive Care unit at Max Saket are well aware of the Nosocomial Infection existing in hospitals and the policy and surveillance regarding it and maintain Standard protocols for encountering any kind of situation.

Many Physicians were able to recall all the Eureka Moments followed as a Standard Protocol after touching a Patient.

Standard protocols of wearing gloves, head cap, apron, and mask are followed. The Physicians are highly conscious regarding that the hand hygiene practices and they are aware that wearing of gloves does not eliminates the hand washing practices.

Physicians sometimes feels challenging in treating the nosocomial infection due to the unavailability of some particular drugs, over usage of antibiotics and they feel highly challenged in treating patients with Resistant bugs and Pseudomonas Infection.

Physicians suggested some initiatives that can help them in overcoming the challenges and providing better care facilities to the patient.

- Adhering to strict Hand Hygiene Protocols.
- Strict Implementation of Protocols and New Antibiotics Research
- Nurse training and education regarding Nosocomial Infections.
- Rationalization of Antibiotics.
- Regular use of Personal Protective Equipment while treating patients.
- Standard Protocols to be followed.

SUGGESTIONS & RECOMMENDATIONS

1. Educate Doctors about Hand Hygiene; implementing standard precautions, particularly best hand hygiene practices at the bedside. Hand washing should be monitored regularly and continuous encouragement should be done.
2. Patient and his attendant should be educated and the importance of Hand Hygiene Practises should be explained to them.
3. Peer-to-peer learning will help in reducing the health care associated.

As quoted in a study peer to peer learning helped [California hospitals participating in the Patient Safety First initiative](#) reduce ventilator-associated pneumonia by 57 percent, catheter-associated urinary tract infections by 24 percent, and sepsis mortality rates from 22.58 out of 100 in 2009 to 16.62 in 2012, according to a report from the National Health Foundation.

4. Consider Utilizing copper surfaces on bed rails, tables, IV poles and nurse call buttons.

Copper surfaces could [reduce infections by as much as 60 percent](#), as seen in a study from researchers from the Medical University of South Carolina and published last year in *Infection Control and Hospital Epidemiology*.

The electrical conductivity of copper "literally steals the electricity inside the microbes, rendering them inactive," researcher Michael Schmidt, Ph.D., said in a Medical University of South Carolina announcement, as *FierceHealthcare* previously reported. "They literally die because they run out of juice."

5. An observer usually a nurse should use a checklist to ensure that evidence based practises are followed - Hand washing before line placement
 - Full barrier precautions
 - Avoiding line placement at the Femoral Site
 - Using Chlorohexidine to cleanse the site.
 - Removing unnecessary lines.

(Using the above practice it has been seen that the infection rate reduces by almost 70%, mean rate of infection reduces from 4.5 per 1000 days to 1.3 per 1000 beds using central line in a study conducted by John Hopkins University's School of Medicine & Bloomberg)

6. Using Gamification Method award trophies to the ICU having recorded minimum no of cases of Healthcare Associated Infections. The nurses and Physicians of the particular department should be awarded and appraised creating competitiveness among others to perform well and win prize.
7. Complying with the Recommendations of the Antimicrobial use Committee regarding the use of antibiotics.
8. Improving & Promoting staff education and accountability; conducting research to adapt and validate surveillance protocols followed in the hospital.
9. Conducting research on the potential involvement of patients and their families in HCAI reporting and control.
10. There are only five infection control nurses. Employing more nurses for infection control team will minimize the work load of IC nurse, so that work is made effective.
11. The infection control nurse maintains the surveillance data on infection control. Each ward in-charge and separate ICU's data should also be maintained the same.
12. It is suggested to provide the feedback regarding rating to medical and nursing staffs (can be through circulars, newsletters etc)
13. Experienced and well trained staffs only should be allowed to treat "ISOLATED" patients. Adequate gloves, masks and disinfectants are available. The usage must be monitored by infection control team.
14. Outsourcing staffs should also be educated about infection control so that development of infection can be minimized to the least.
15. There should be initial orientation for new staffs that includes staff from every department that has linkage to the ICU's e.g. Housekeeping, Food & Beverage on infection control. Training and educating newly recruited staffs will minimize infections in and around hospital.
16. There should be increase in knowledge regarding HCAI and routes of transmission, barrier nursing and hand washing techniques, hospital waste management, and importance of infection control team.
17. Nurses have a critical role to play in prevention and infection control and they should have scopes for continuous professional development.
18. Infection Control Nurses should be participating in the development & operation of Regional & National Infection Control Initiative.

CONCLUSION

The study revealed that current physical facilities available for infection control are good and meets the NABH standard level. The study also provides baseline infections of Healthcare Associated Infections & associated risk factors for future surveillance. If the measures followed are continuously updated and upgraded the infection level can be further reduced. This can be done by giving training awareness Training Programme on Standard Requirements, guidance on implementation of infection control programmes. The awareness about infection control should also be developed among visitors. The awareness about the infection has to be created that will help in decrease of infections and control of the same.

ANNEXURE 1: QUESTIONNAIRE FOR PHYSICIANS

Name of the Physician	
Employee ID	
ICU At MSSH, Saket	
Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup? a. Ventilator Associated Pneumonia(VAP) b. Methicillin Resistant Staphylococcus aureus(MRSA) c. Catheter Associated Urinary Tract Infection(CAUTI) d. Centre Line Associated Blood Stream Infections(CLABSI) e. All of the above	
Do you have an infection control team in your hospital?	(Yes/No)
Are you aware of any manual or policy for nosocomial infections in your hospital?	(Yes/No)
Have you receive a formal training for hand hygiene? What moments do you follow?	(Yes/No) No of moments:
What is the ideal time of hand washing? a. 20 seconds b. 2 minute c. 30seconds d. 1 minute	
Is there any surveillance system for recording nosocomial infection? If yes, What is it?	(Yes/No) Name:
Do you use PPE (personal protective equipment)?	(Yes/No)
Do you agree that wearing gloves eliminate the use of washing hands?	(Yes/No)
Is there a trained nurse employed regularly in the facility?	(Yes/No)
Do you feel having more patients hamper your hand washing practices?	(Yes/No)
Are there regular checkups for Physicians who comes in contact with infected patient? If yes how frequently?	(Yes/No) Frequency =.....
How frequently do you screen patients for infection in the ICU?	(Yes/No) Frequency =.....
Do you believe your colleagues follow standard protocols?	(Yes/No)

What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)?	
What should be the No of air changes in an isolation room? e. 15 f. 20 g. 25 h. 30	
Is there availability of a member from the infection control team?	(Yes/No)
Challenges you face while treating nosocomial infection?	
Initiatives (if any) should be taken for better controlling of nosocomial infections?	

ANNEXURE 2: QUESTIONNAIRE FOR NURSES

Name of the Staff	
Employee ID	
ICU At MSSH, Saket	
Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup? f. Ventilator Associated Pneumonia(VAP) g. Methicillin Resistant Staphylococcus aureus(MRSA) h. Catheter Associated Urinary Tract Infection(CAUTI) i. Centre Line Associated Blood Stream Infections(CLABSI) j. All of the above	
Are you aware of any manual or policy for nosocomial infections in your hospital?	(Yes/No)
Have you receive a formal training for hand hygiene? If yes? How many steps are there?	(Yes/No) Steps:
What is the minimal time of hand washing? i. 30 seconds j. 1 minute k. 20seconds l. 2 minute	
Is there any surveillance system for recording nosocomial infection? If yes, what is it?	(Yes/No) Name:
Do you receive staff training for nosocomial infection? If yes, How frequently?	(Yes/No) Frequency =
Do you know what to do in an event of an Incident? If yes? What do you do? e.g. needle stick injury	(Yes/No)
Do you use PPE (personal protective equipment)? If yes, what all are included in it?	(Yes/No)
Do you agree that wearing gloves eliminate the use of washing hands?	(Yes/No)
Do you go in ICU on call or are placed in shifts?	
Is there a continuous availability of supplies for standard precautions of infection?	(Yes/No)
Are there regular checkups for nurse who comes in contact with infected patient? If yes how frequently	(Yes/No) Frequency = 81

How frequently do you screen patients for infection?	(Yes/No) Frequency =.....
Do you believe your colleagues follow standard protocols?	(Yes/No)
Do you agree that wearing gloves eliminates the need of hand washing?	(Yes/No)
What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)?	
Do you feel understaffing/ overcrowding in relation to hand washing practices?	(Yes/No) Frequency =.....
Does any member of the Infection Control Team work with the pharmacy to ensure compliance with antibiotic policy?	(Yes/No)
Is there any assessment of the effectiveness of infection control training? How frequently do you receive training?	(Yes/No) Frequency =.....
Does the staff receive awards of their hand washing performance? If yes? How frequently?	(Yes/No) Frequency =.....
Challenges you face while providing care to the patient?	
Initiatives (if any) should be taken for better controlling of nosocomial infections?	

ANNEXURE 3: QUESTIONNAIRE FOR INFECTION CONTROL NURSES

Name of the Staff	
Employee ID	
ICU At MSSH, Saket	
Which of the following are most common encountered nosocomial infections (can select multiple) in your hospital setup? k. Ventilator Associated Pneumonia(VAP) l. Methicillin Resistant Staphylococcus aureus(MRSA) m. Catheter Associated Urinary Tract Infection(CAUTI) n. Centre Line Associated Blood Stream Infections(CLABSI) o. All of the above	
Are you aware of any manual or policy for nosocomial infections in your hospital?	(Yes/No)
Have you receive a formal training for hand hygiene? If yes? How many steps are there?	(Yes/No) Steps:
What is the minimal time of hand washing? m. 30 seconds n. 1 minute o. 20seconds p. 2 minute	
Is there any surveillance system for recording nosocomial infection? If yes, what is it?	(Yes/No) Name:
Do you receive staff training for nosocomial infection? If yes, How frequently?	(Yes/No) Frequency =.....
Do you know what to do in an event of an Incident? If yes? What do you do? e.g. needle stick injury	(Yes/No)
Do you use PPE (personal protective equipment)? If yes, what all are included in it?	(Yes/No)
Do you agree that wearing gloves eliminate the use of washing hands?	(Yes/No)
Do you go in ICU on call or are placed in shifts?	
Is there a continuous availability of supplies for standard precautions of infection?	(Yes/No)
Are there regular checkups for nurse who comes in contact with infected patient? If yes how frequently	(Yes/No) Frequency =.....

How frequently do you screen patients for infection?	(Yes/No) Frequency =.....
Do you believe your colleagues follow standard protocols?	(Yes/No)
Do you agree that wearing gloves eliminates the need of hand washing?	(Yes/No)
What is the standard protocol of wearing these in order (Mask, apron, gloves, head cap)?	
Do you feel understaffing/ overcrowding in relation to hand washing practices?	(Yes/No) Frequency =.....
Does any member of the Infection Control Team work with the pharmacy to ensure compliance with antibiotic policy?	(Yes/No)
Is there any assessment of the effectiveness of infection control training? How frequently do you receive training?	(Yes/No) Frequency =.....
Does the staff receive awards of their hand washing performance? If yes? How frequently?	(Yes/No) Frequency =.....
Challenges you face while providing care to the patient?	
Initiatives (if any) should be taken for better controlling of nosocomial infections?	

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**STUDY ON THE USAGE OF THE RESTRICTED ANTIBIOTIC
≥3 POLICY & IT'S COMPLIANCE IN MAX HEALTHCARE,
SAKET FROM**

JANUARY – APRIL 2015

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 2014-2016.

I would like to state that I have carried out my Internship on the topic “Study on the usage of the Restricted Antibiotic ≥ 3 Policy & it’s Compliance in Max Healthcare, Saket from January – April 2015” under the guidance of Dr. Bansidhar Tarai, MD (Senior Consultant, Microbiology) 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.Sahil Thakur

IIHMR University

(2014-2016)



Labs 24x7

ACKNOWLEDGEMENT

A summer project is a golden opportunity for learning and self development.

I consider myself very lucky and honoured to have wonderful people leading me through the completion of this project.

I consider myself fortunate for having been provided an opportunity to undergo summer training at Max Super Specialty Hospital, Saket, New Delhi and wish to express my indebted gratitude to Dr. Sahar Qureshi, Assistant General Manager Operations, MSSH, East Block

I also wish to extend a special thanks to Dr. Bansidhar Tarai, MD, Senior Consultant (Microbiology), Pan Max – Coordinator, who in spite of being extraordinarily busy with his duties, took time to hear, guide and keep me on the correct path and allowing me to carry out my project work at their esteemed organization during the training.

I take this opportunity to express my profound gratitude and keep regards to my Mentor, Dr. Sandeep Mor, Deputy Medical Superintendent, for his guidance and constant encouragement during the course of project.

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Lastly, I thank Almighty, my family and friends for their constant encouragement without which assignment would not be possible.

Dr. Sahil Thakur

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CONDITIONS OF REPORTING:

1. The tests are carried out in the lab with the presumption that the specimen belongs to the patient name or identified in the bill/test request form. 2. The test results relate specifically to the sample received in the lab and are presumed to have been generated and transported per specific instructions given by the physician/laboratory. 3. The reported results are for the information and interpretation by the referring doctor only. 4. Some tests are referred to other laboratories to provide a wider test menu to the customer. 5. Max Healthcare shall in no event be liable for accidental damages loss, or destruction of specimen which is not attributable to any direct and mala fide act or omission of Max Healthcare or its employees. Liability of Max Healthcare for deficiency of services, or other errors and omissions shall be limited to fee paid by the patient for the relevant laboratory services.

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INTRODUCTION

Resistance to antimicrobial agents is a major public health problem. If the current rate of increase in resistance to antimicrobial agents continues, it is possible we may see the return of the pre-antibiotic (AB) era, i.e. the emergence of the post-AB era. Although cooperative efforts between industry, academia and government to revive the pipeline of antimicrobial drugs have been proposed, we face a decade or longer during which introduction of new antimicrobial agents is expected to be minimal. Thus, to ensure that options exist for treating infections, it is imperative to make the best use of those antimicrobials that are currently available.

Restricted antibiotics drugs have often been the target of attempts to restrict and control their use so that no harm can be caused and resistance must not be developed to these drugs for providing better care to the patient. The study aims to review the usage of Restricted Antibiotics ≥ 3 policy and its compliance followed to encounter them and measures that can be taken to attain minimum level abuse of the Restricted Antibiotics as the misuse can lead to an enormous amount of side-effects from a simple rash to severe nosocomial infection. The study aims to establish or strengthen surveillance systems on antimicrobial resistance and on the use of antimicrobial agents, to implement control and preventive measures to support the prudent use of antimicrobial agents and contribute to limiting the spread of communicable disease.

REVIEW OF LITERATURE

Antimicrobial resistance in pathogens causing important communicable diseases has become a matter of great health concern globally including our country. Resistance has emerged even to newer, more potent antimicrobial agents like carbapenems. The factors responsible for this are widespread use and availability of practically all the antimicrobials across the counter meant for human, animal and industrial consumption. There are definite policies / guidelines for appropriate use of antimicrobials at national level in specific national health programmes being run in the country e.g. RNTCP, National AIDS control programme, etc. For other diseases of public health importance like enteric fever, diarrhoeal disease, respiratory infections, etc the individual hospitals are following their own antimicrobial policies and hospital infection control guidelines. To monitor antimicrobial resistance it is necessary to have regulations for use and misuse of antibiotics in the country, creation of national surveillance system for antibiotic resistance, mechanism of monitoring prescription audits, regulatory provision for monitoring use of antibiotics in human, veterinary & industrial sectors and identification of specific intervention measures for rational use of antibiotics. Projects of importance for antimicrobial resistance funded by DG SANCO in 2007 were, among others, the European Antimicrobial Resistance Surveillance System, the Scientific Evaluation on the Use of Antimicrobial Agents in Human Therapy and the EU Committee on Antimicrobial Susceptibility Testing. In 2002, the WHO issued the Antimicrobial Resistance Fact Sheet No. 194 which named hospitals a critical component of the antimicrobial resistance problem worldwide (<http://www.who.int/mediacentre/factsheets/fs194/en/print.html>). According to the WHO, the combination of highly susceptible patients, intensive and prolonged antimicrobial use, and cross-infection has resulted in nosocomial infections with highly resistant bacterial pathogens. Resistant hospital-acquired infections are expensive to control and extremely difficult to eradicate. Failure to implement simple infection control practices, e.g. hand washing and changing gloves before and after contact with patients is a common cause of infection spread in hospitals throughout the world. Many patients with severe infections due to resistant pathogens acquired in the community also end up in hospital.

RATIONALE

This report is indented to find out the usage of Restricted Antibiotics and its abuse and studying the surveillance system used to monitor the same. Reducing the drug abuse of Restricted Antibiotics can lead to decrease in number of side effects to the patient make them less resistant to antibiotics and ultimately lead a healthy life which will significantly enhancing the hospital's image.

Recommending specific intervention measures such as rational use of Restricted Antibiotics and establishing a standard protocol procedure for controlling the usage of Restricted Antibiotics & its compliance will help in promoting efficiency amongst the employees and helps in establishing a significant position of the hospital amongst competitors.

OBJECTIVES

- To study the pattern of Restricted Antibiotics and usage of ≥ 3 at Max Super Specialty Hospital, Saket.
- To search for areas of problem and find reasons for the same.
- To give recommendations for further improvement to prevent the abuse of Restricted Antibiotics.

METHODOLOGY

- **Type of study** : Descriptive cross-sectional
- **Study population** : In Patients from January to April 2015 at Max Super Speciality Hospital, Saket, Delhi
- **Study area** - All ICU's at Max Hospital, East & West wing, Saket, Delhi
- **Duration of Study** – 4 months
- **Type of Data** - Quantitative& Qualitative
- **Technique** – Data collected.
- **Tool** – Questionnaire
- **Sample size** – 11,017 In patients from January to April 2015
- **Sampling technique**- Non probability sampling

- ***Inclusion criteria-***

- All In-Patients Admitted in Max Hospital, East & West wing, Saket from January to April, 2015.
- Standard Protocols Followed by Doctors for the usage of Restricted Antibiotics at Max Saket Hospital.

- ***Exclusion criteria-***

- Other Antibiotics Usage is not taken in account.

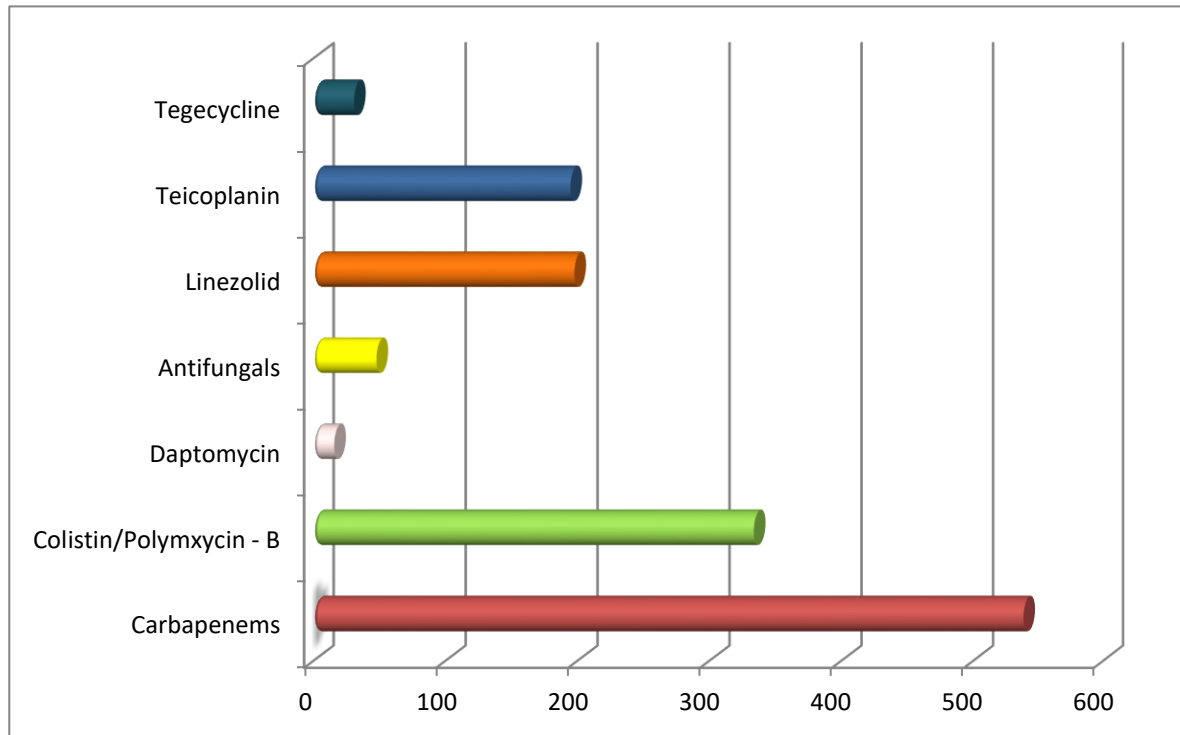
- ***Data collection*** - Quantitative (4 Months)

- ***Data entry-*** Manually

- ***Data Analysis-*** Using bar charts, pie charts

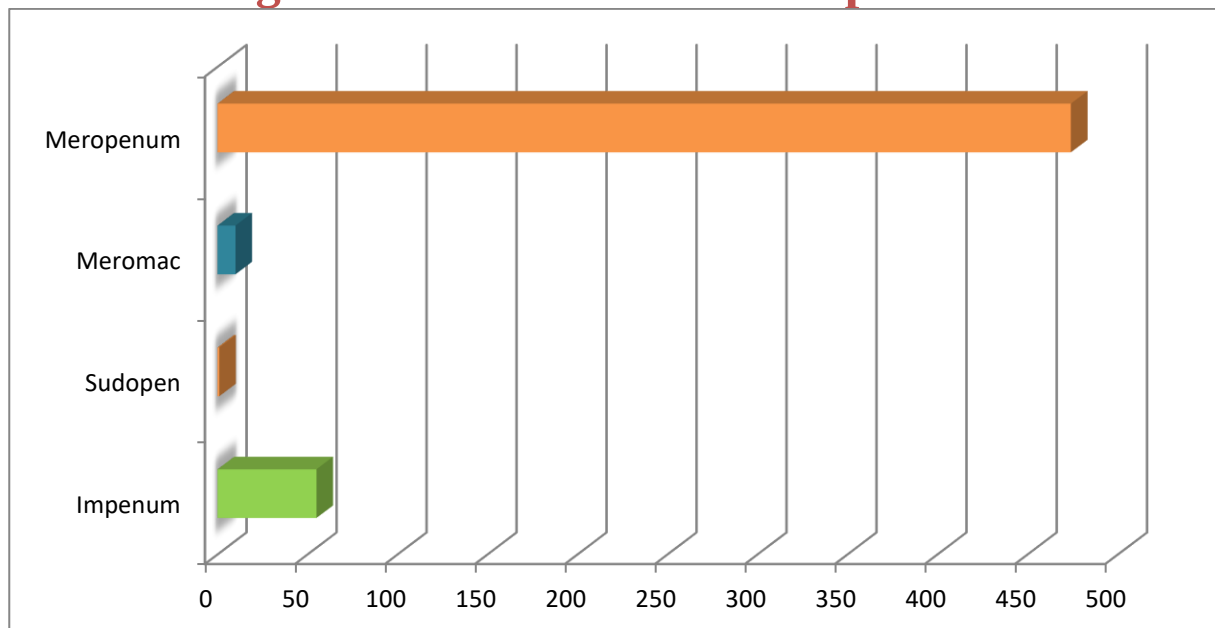
DATA ANALYSIS

Fig 1.Restricted Antibiotics Usage ≥ 3



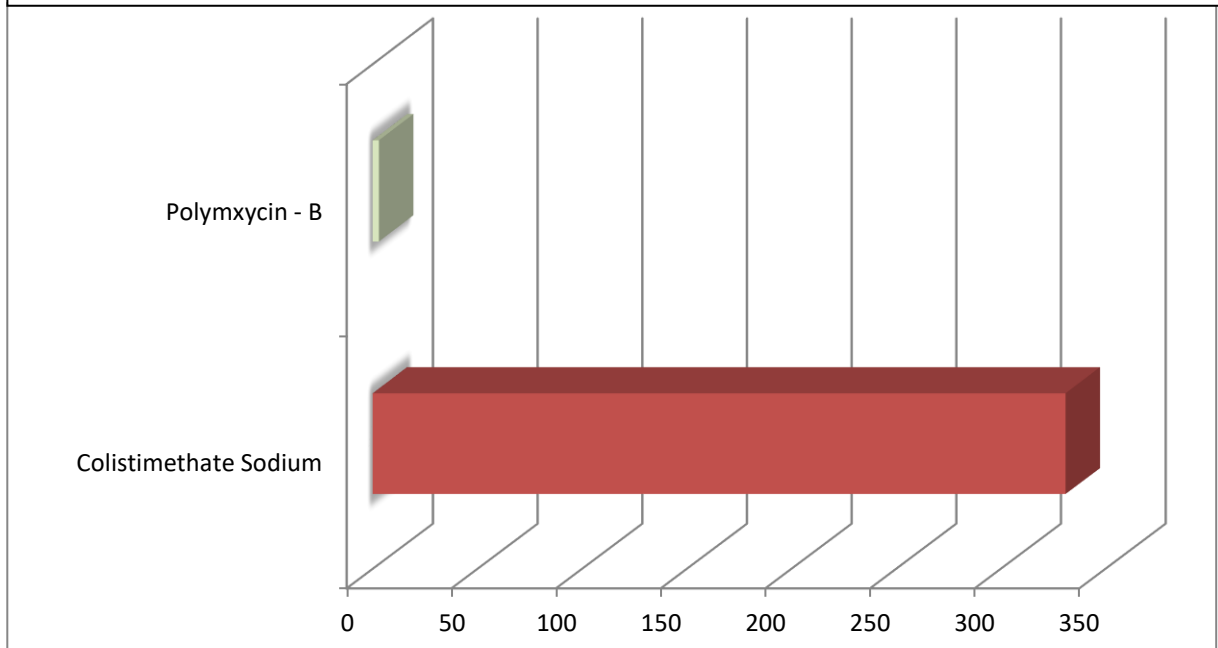
INFERENCE: The figure shows that **Carbapenems** are the maximum used Restricted Antibiotics

Fig 2.Maximum used Carbapenems



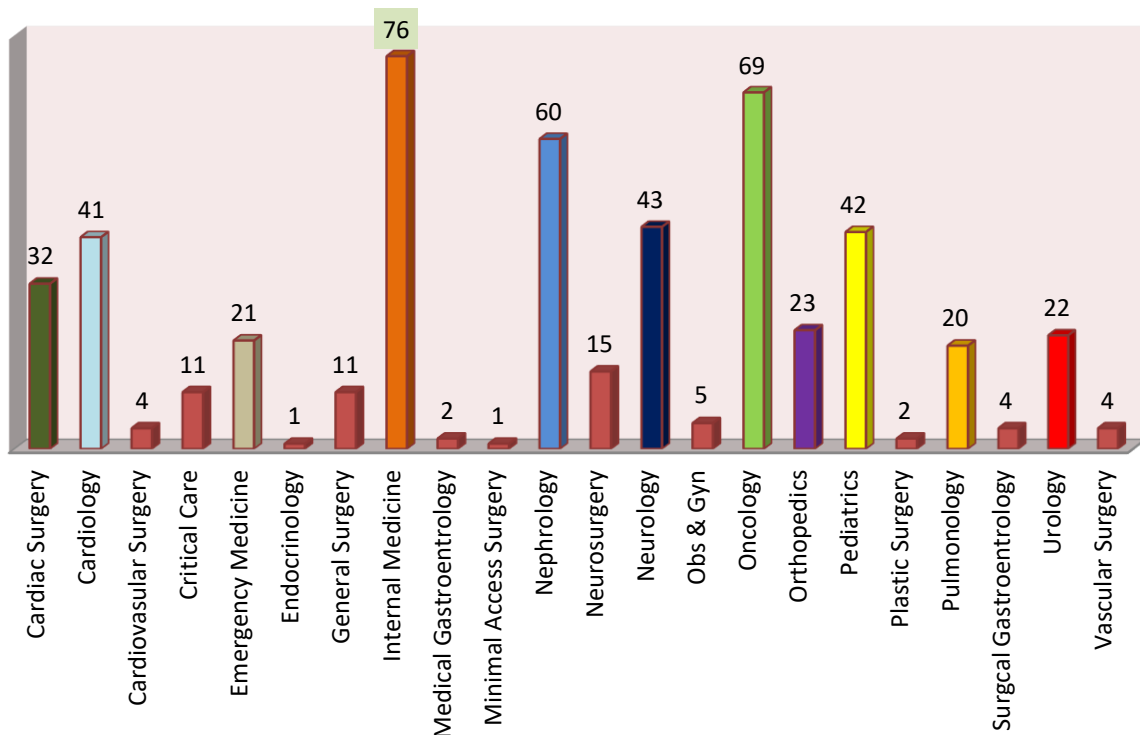
INFERENCE: The above figure reveals **Meropenum** is the maximum used Carbapenems

Fig 3. Maximum used Polymyxin



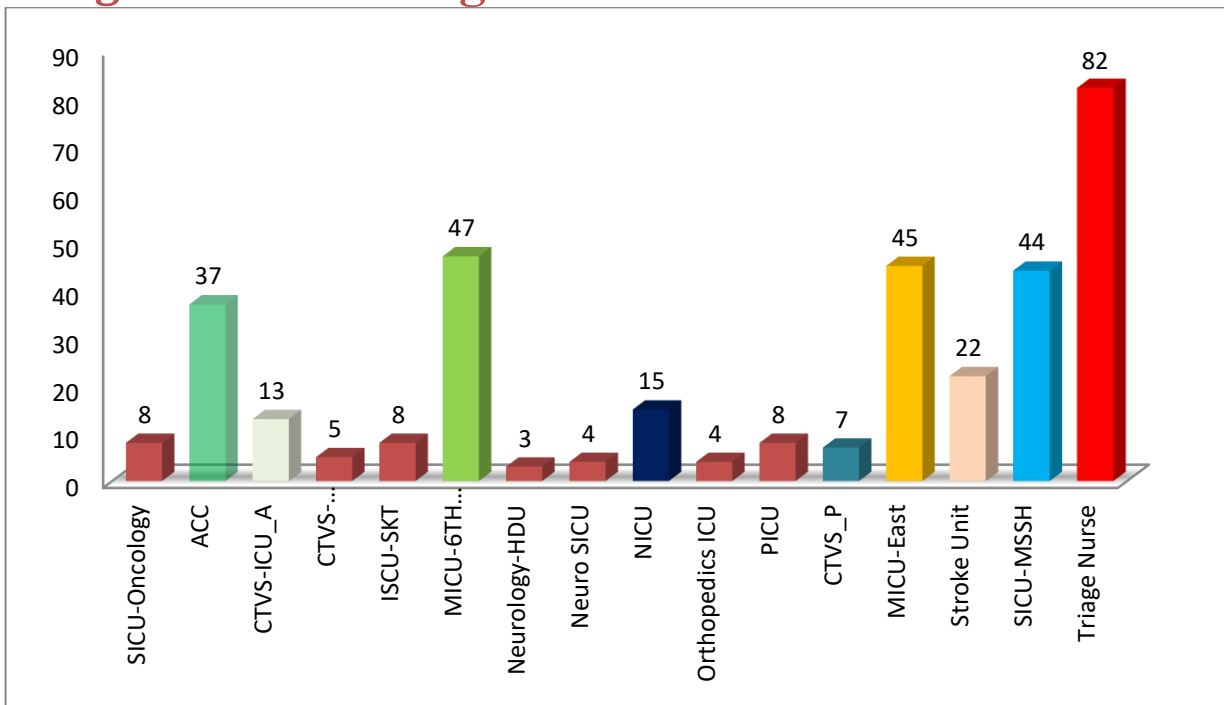
INFERENCE: The figure reveals Colistimethate sodium is the maximum used Polymyxin

Fig 4. RA Dosage ≥ 3 According to Departments



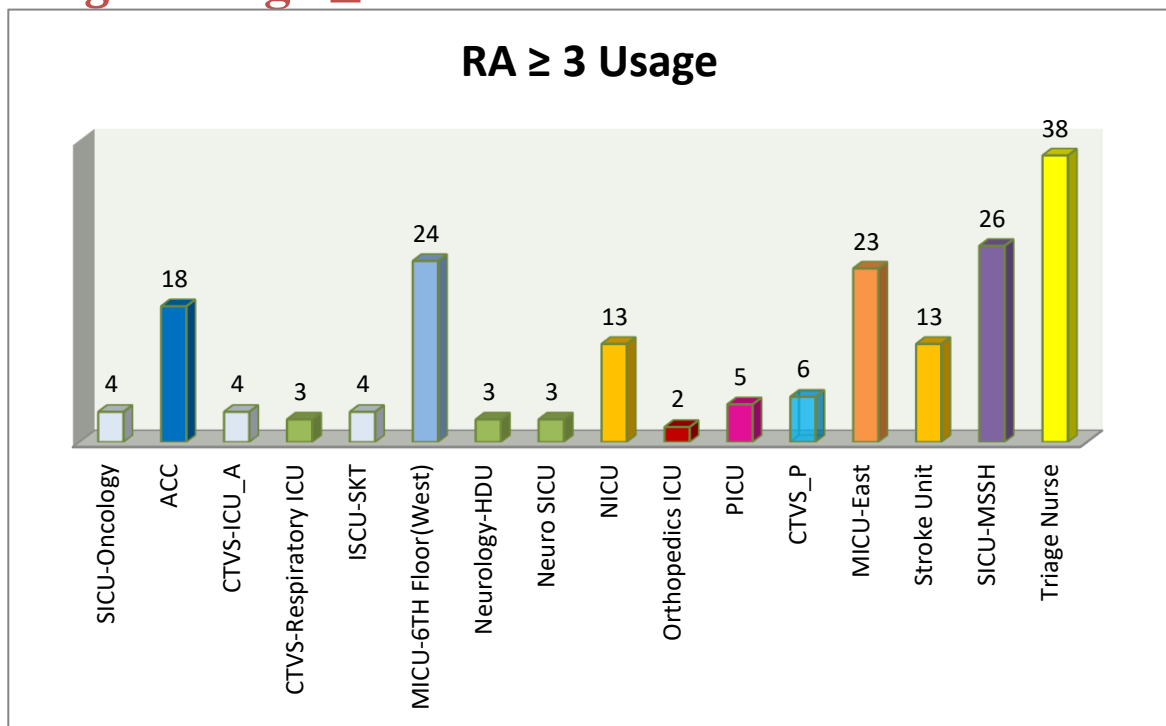
INFERENCE: The figure shows us that Internal Medicine makes use of Restricted Antibiotics the maximum.

Fig 5. Normal Usage of Restricted Antibiotics in ICU's



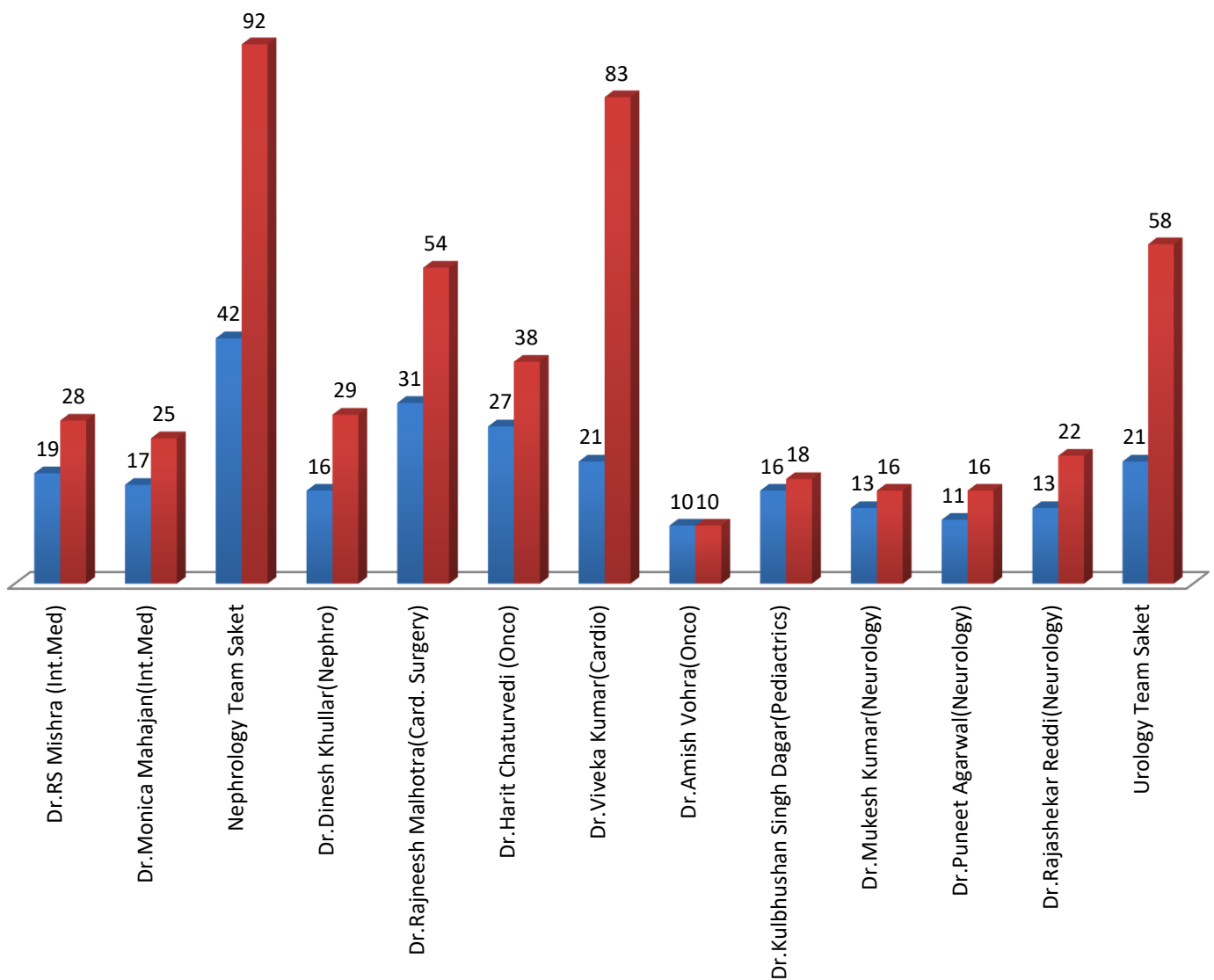
INFERENCE: The figure reveals us that the **Triage Nurses** use the maximum Restricted Antibiotics

Fig 6. Usage ≥ 3 Restricted Antibiotics in ICU's



INFERENCE: The figure shows us that the **Triage Nurses** use the maximum Restricted Antibiotics ≥ 3

Fig 7.Comparison of Top 8 Doctor's using Restricted Antibiotics ≥ 3 & Total Usage



INFERENCE: The above figure shows us that Nephrology Team and Cardiology Unit at Max Saket Hospital made maximum use of Restricted Antibiotics

Fig 8. (East) Ward wise total usage of RA

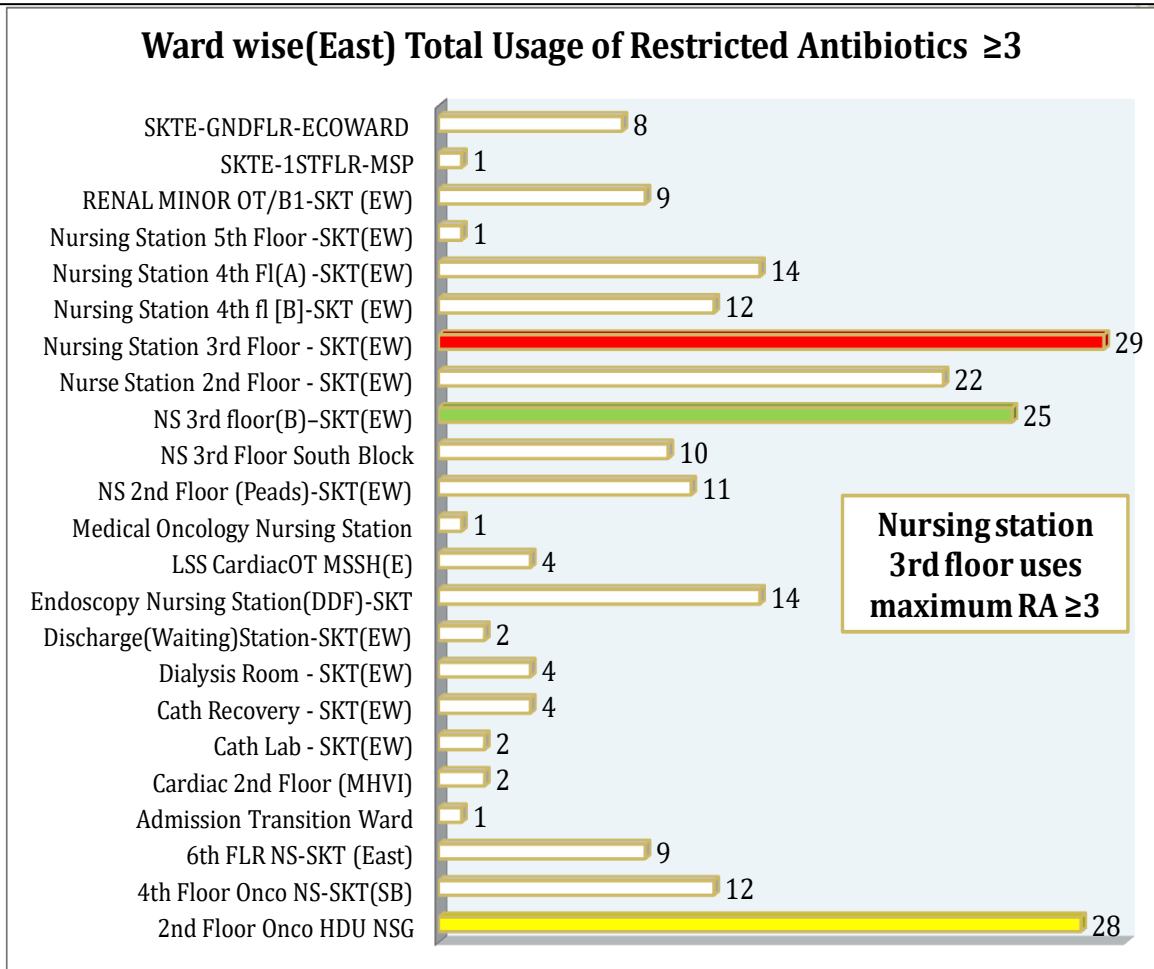


Fig 9.Ward wise (West) Total Usage of Restricted Antibiotics

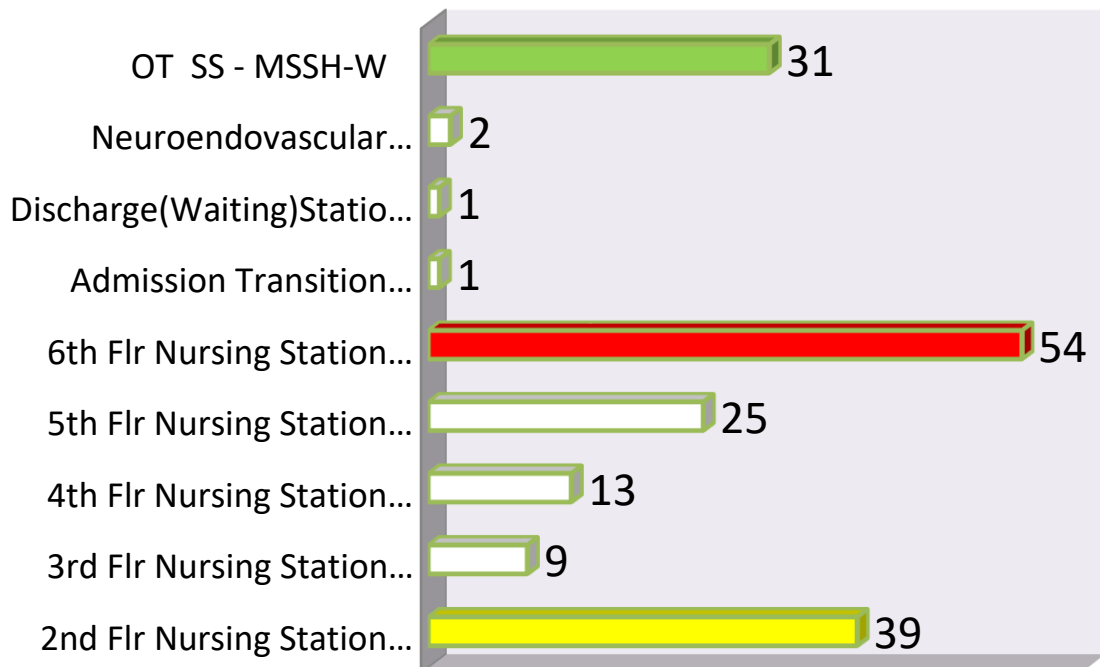


Fig 10.Ward wise(West) Total Usage of Restricted Antibiotics ≥ 3

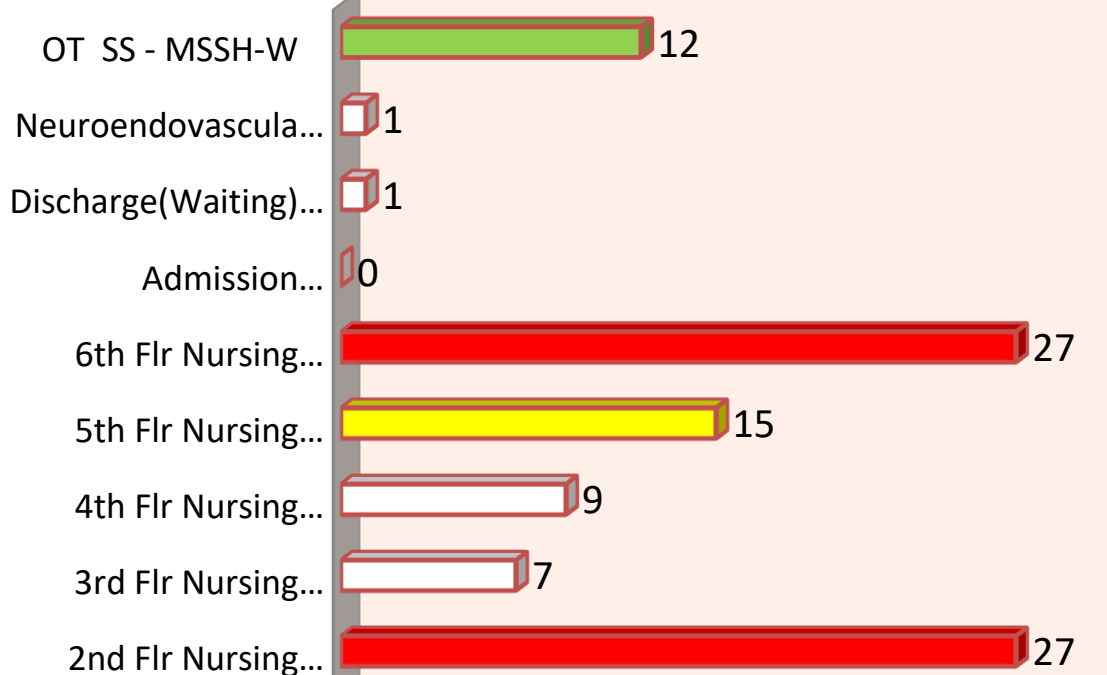
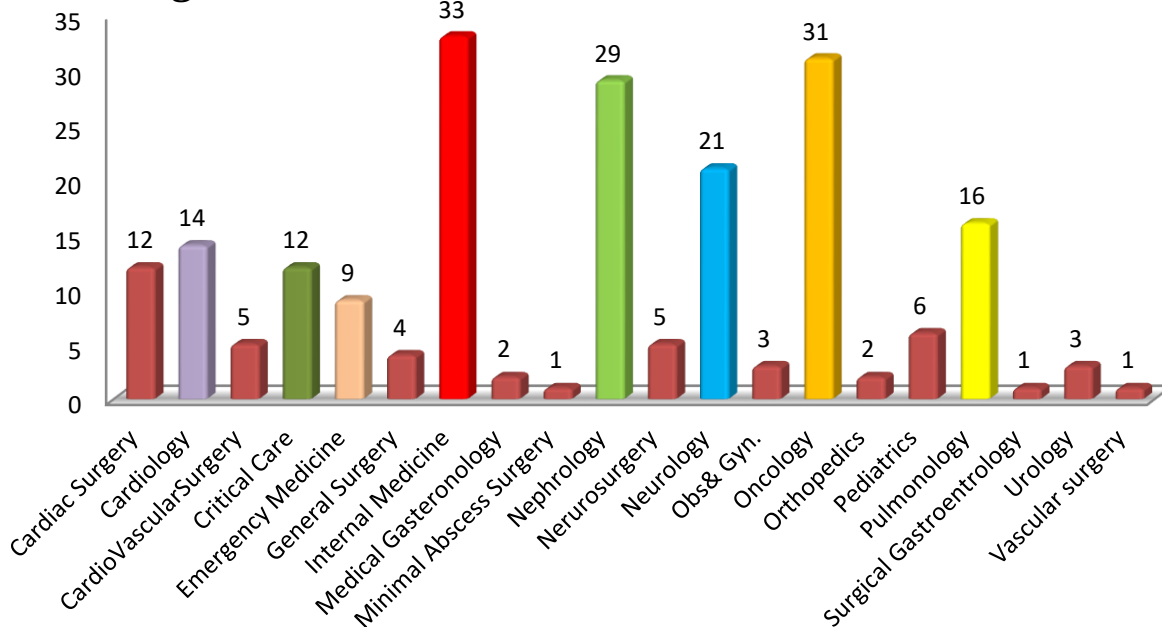


Fig 11. Patient on ≥ 3 Different Antibiotics



DISCUSSION & RESULTS

- The three maximum administered Restricted antibiotics are:
 - Carbapenems
 - Polymyxycin
 - Linezolid
 - The maximum used Carbapenem is **Meropenum** & maximum used Polymyxycin is **Colistimethate Sodium**.
- The three departments administering maximum number of Restricted antibiotics are:
 - Internal medicine
 - Oncology
 - Nephrology

- The three departments administering maximum number of Restricted antibiotics are:
 - Internal medicine
 - Oncology
 - Nephrology
- The three ICU's administering maximum number of Restricted antibiotics both normal and ≥ 3 RA's are:
 - Triage Nurses
 - Medical ICU 6th Floor (West wing)
 - Medical ICU (East wing)
- The Ward in **(East Wing)** using maximum number of Restricted Antibiotics is 2nd **Floor Nursing Station** & Ward using **RA ≥ 3** is 3rd **Floor Nursing Station**.
 - The Ward in **(West Wing)** using maximum number of Restricted Antibiotics is 6th **Floor Nursing Station** & Ward using **RA ≥ 3** is 6th and 2nd **Floor Nursing Station**.
 - Out of the total patients i.e. (1022) on Restricted Antibiotics; 202 patients were such who received 3 or more different types of antibiotics.
 - Top 3 Departments administering 3 or more antibiotics on the same patient are :
 - Internal Medicine
 - Oncology
 - Nephrology
- Only 62% justification forms were filled for the total usage of Restricted Antibiotics leading to un-compliance of the antibiotics policy

SUGGESTIONS & RECOMMENDATIONS

- Awareness about the resistance to restricted antibiotics.
- Prohibiting the use of restricted antibiotics as first line treatment drugs.
- Auditing to be carried out on regular basis.
- Encourage microbiological documentation of infection by increasing access to laboratories and improving laboratory proficiency and turn about times.
- Justification forms for all cases to be filled whenever following compliance with the Restricted Antibiotic Policy.
- In the situation, that the patient is being administered restricted antibiotics, yet is sensitive to other drugs, the use of restricted antibiotics should be

stopped at once to reduce the cost of health care and to avoid resistance to the drug.

- Standardize susceptibility testing ensuring proficiency.
- Improve the clinical diagnosis of infection.
- Multidisciplinary care delivery involving pharmacy, microbiology etc.

CONCLUSION

It is imperative that all the clinicians understand the principles and standard methods of antibiotic susceptibility tests. They should also insist on the laboratory to follow these recommended procedures to generate antibiotic susceptibility test reports that are quality assured. Antimicrobial susceptibility data generated based on consistent reproducible and comparable data between different laboratories will produce better outcomes and help in developing region-wise antibiograms

Reducing the use of antimicrobials to only those situations where they are warranted, at the proper dose and for the proper duration, is the prerequisite for sustainable control of antimicrobial resistance. Physicians are primarily concerned with the effects of antimicrobials on the individual patients in their care, not about the risk of contributing to the problem of antimicrobial resistance in society.

All the tertiary care hospitals (public or private) need to develop their SOP's and Guidelines as per the national guidelines and implement in their setting.

The guidelines in the hospital to be reviewed every 6 months; national guidelines To be reviewed on yearly basis.

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