

SUMMER PLACEMENT

In

Fortis Memorial Research Institute Gurgaon

1st April – 30th May, 2015

A Summer Internship Report

Submitted By:

DR. SONALIKA SINGH

MBA IN HOSPITAL AND HEALTH MANAGEMENT

(2014-2016)



Institute of Health Management Research, Jaipur

CERTIFICATE

This is to certify that Dr. Sonalika Singh has undergone summer training at Fortis Memorial Research Institute, Gurgaon from April 1 to May 30, 2015.

The candidate carried out all the studies related to summer training herself. Her approach to the studies has been sincere, scientific and analytical. This summer training in partial fulfilment of the course requirement is recommended for the award of MBA in Hospital and health management.

I wish her success in all future endeavours.



Col. (Dr.) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur



Dr. SD Gupta

President

The IIHMR University, Jaipur

May 30, 2015

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Sonalika Singh** has undergone an internship in “Quality” from **April 1 to May 30, 2015**

During her training **Dr. Sonalika** exhibited a high level of professionalism and a tremendous zest for learning.

We wish **Dr. Sonalika** all the best in her future endeavors.

With Best Wishes,



Ritu Verma

Senior Manager- Human Resources

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“A Great achievement solution dawns with an idea, grows with our effort and attains fulfilment with our will power”. In our effort towards the realization of my project work, I have drawn on the guidance of many people for which I’m glad to acknowledge.

My institute – Institute of Health Management Research (IIHMR), Jaipur and its education deserves the foremost appreciation for providing me the opportunities to understand my individual capabilities. Of course, the entire faculty at IIHMR had facilitated the endeavour. I acknowledge the contribution of my mentor **Dr. S.D. Gupta** (Director- IIHMR) whose detailed suggestions have vastly enhanced the quality of my work.

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I’m also thankful to all those who have directly or indirectly encouraged me to complete this project.

Abbreviations:

SSI: Surgical site infections

FMRI: Fortis Memorial Research Institutes

HICC: Hospital Infection Control Committee

CDC: Centre of Disease Control and Prevention

AMS: Antimicrobial stewardship

OT: Operation Theatre

OR: Operating Room

MTP: Medical Termination of Pregnancy

MABGIS: Minimal Access, Bariatric & Gastro Intestinal Surgery

OBGY- Obstetrics & gynecology

ENT: Ear, Nose and Throat

HCAI: Healthcare-Associated Infections

NACO: National AIDS control organization

CDSCO: Central Drugs Standard Control Organization

ICU: Intensive Care Unit

HAI: Hospital Acquired Infection

1. Organization Profile: Fortis Healthcare Limited

Fortis Healthcare Limited is a leading, pan Asia-Pacific, integrated healthcare delivery provider.

The healthcare verticals of the company span diagnostics, primary care, day care specialty and hospitals, with an asset base in 11 countries, many of which represent the fastest-growing healthcare delivery markets in the world.

Currently, the company operates its healthcare delivery network in Australia, Canada, Dubai, Hong Kong, India, Mauritius, New Zealand, Singapore, Sri Lanka, Nepal and Vietnam with 76 hospitals, over 12,000 beds, over 600 primary care centres, 191 day care specialty centres, over 230 diagnostic centres and a talent pool of over 23,000 people. Fortis Healthcare is driven by the vision of becoming a global leader in the integrated healthcare delivery space and the larger purpose of saving and enriching lives through clinical excellence. The company provides patient services including nuclear medicine and cardiac imaging, laboratories, scans, cardiology, cardiac pacing, electrophysiology, neurosciences, orthopedics, gynecology and obstetrics, pediatrics, maternity services, diagnostic services, paediatric ophthalmology, neurophthalmology, internal medicine, general surgery, urology, nephrology, gastroenterology, mental health and behavioural sciences, rehabilitative services, pulmonology and IVF etc.

1.1. The Fortis Logo

LOGO

‘A Healing Passion’

The Fortis Healthcare Limited Logo defines the commitment to the patient care. The logo reflects their endeavor to achieve excellence in healthcare delivery system by bringing together the best of technology, medical expertise, and patient care. The logo also implies the human values that govern every facet of our organization.

The two nurturing hands along with a red dot on the top depicts – ‘nurturing hands caring for the human life’

GREEN is a colour of healing and depicts WELLBEING and RED is a symbol of steadfast focus, dynamic zeal and enthusiasm.

1.2. Mission of Fortis Healthcare Limited:

To become an Integrated Healthcare delivering organization guided by quality, excellence, technology and compassionate patient care

1.3. Vision of Fortis Healthcare Limited:

To be a globally respected healthcare organization known for Clinical Excellence and Distinctive Patient care

1.4. Values of Fortis Healthcare Limited:

Patient Centricity	Commit to 'best outcomes and experience' for our patients. Treat patients and their caregivers with compassion, care and understanding. Our patients' needs will come first
Integrity	Be principled, open and honest. Model and live our 'Values'. Demonstrate moral courage to speak up and do the right things.
Teamwork	Proactively support each other and operate as one team. Respect and value people at all levels with different opinions, experiences and backgrounds. Put organization needs' before department / self interest.
Ownership	Be responsible and take pride in our actions. Take initiative and go beyond the call of duty. Deliver commitment and agreement made.
Innovation	Continuously improve and innovate to exceed expectations. Adopt a 'can-do' attitude. Challenge ourselves to do things differently.

1.5. List of Hospitals of the Fortis Healthcare Limited:

Amritsar	Amritsar	Fortis Escorts Hospital
Bangalore	Bannerghatta Road	Fortis Hospital
Bangalore	Cunningham Road	Fortis Hospital
Bangalore	Nagarbhavi	Fortis Hospital
Bangalore	Rajajinagar	Fortis Hospital
Bangalore	Seshadripuram	Fortis Hospital
Chennai	Adyar	Fortis Malar Hospital
Dehradun	Dehradun	Fortis Escorts Hospital
Faridabad	Faridabad	Fortis Escorts Hospital
Gurgaon	SECTOR-44	Fortis Memorial Research Institute
Jaipur	Jaipur	Fortis Escorts Hospital
Kangra	Kangra	Fortis Hospital
Kolkata	Rash Behari Avenue	Fortis Hospital & Kidney Institute
Kolkata	Anandapur	Fortis Hospital
Mohali	Mohali	Fortis Hospital
Moradabad	Moradabad	Fortis Vivekanand Hospital
Mumbai	Vashi	Fortis Hiranandani Hospital
Mumbai	Kalyan	Fortis Hospital
Mumbai	Mulund	Fortis Hospital
Mumbai	Mahim	S.L. Raheja Hospital
Mysore	Mysore	Fortis Cauvery Heart Hospital
New Delhi	Greater Kailash II	Fortis La Femme
New Delhi	Shalimar Bagh	Fortis Hospital
New Delhi	Vasant Kunj	Fortis Flt. Lt. Rajan Dhall Hospital
New Delhi	Okhla Road	Fortis Escorts Heart Institute & Research Centre
Noida	Noida	Fortis Hospital
Raipur	Raipur	Fortis Escorts Heart Centre

2. Fortis Memorial Research Institute, Gurgaon (FMRI)

FMRI is a multi-super specialty, quaternary care hospital with an enviable international faculty, reputed clinicians, including super-sub-specialists and specialty nurses, supported by cutting-edge technology. A premium, referral hospital, it endeavours to be the 'Mecca of Healthcare' for Asia Pacific and beyond. Set on a spacious 11-acre campus with 1000 beds, this 'Next Generation Hospital' is built on the foundation of 'Trust' and rests on the four strong pillars Talent, Technology, Infrastructure and Service.

TALENT: Fortis Memorial Research Institute's comprehensive medical program is driven by reputed doctors, super- sub- specialists and specialty nurses, all committed to integrating their exceptional medical expertise, technology and innovation to offer best – in class treatments.

TECHNOLOGY: Fortis Memorial Research Institute has a complete spectrum of diagnostic and therapeutic technology, including several state-of the-art technologies that are first in the world, first in Asia and first in India.

- Radiation Therapy: First in the world - A collaboration between leading technology innovators Brain Lab and Elekta
- 3- Tesla Digital MRI - World's first digital broadband MRI
- Stem Cell - India's first stem cell lab in a hospital in collaboration with Totipotent Rx a, US based cell Therapy Company.
- Open Lab - India's first ever "see - through" glass lab with instant collection and real time processing of blood - samples.
- e- ICU- An advanced patient management system with two - way audio visual communication. It allows clinicians to access patient 24x7. First of its kind in the world.
- 256 Slice CT - A state of the art 256 Slice Brilliance CT Scanner with the ability to capture an image of the entire heart in just two heart beats
- Bi- Plane Cath Lab - State-of-the-art Bi Plane Cardiac Cath lab to address cardiac and vascular interventions
- Brain Suite - One of its kind CT based Brain Suite, equipped with intra operative CT for brain and spine.
- Time of flight PET CT - An installation with Time of flight (TOF) reconstruction for exceptional image quality. Has the ability to detect lesions as small as 0.1 inches.
- Voice Modulated & Integrated Operating rooms - Two modular operating rooms integrated with equipment and controlled by common control panel.

INFRASTRUCTURE: With landscaped greens, tranquil water bodies, sculptures, sunlit interiors, Fortis Memorial Research Institute follows a design philosophy aimed at healing. The hospital has been built keeping in mind all round wellness – mind, body and soul. Simultaneously meet simple needs of the caring attendants by means of facilities as the Tummy Luck, Meditorium, R&R lounge, Holistic Health, Mamma Mia, Retail Therapy, Crèche, Health 4 U, Spa and Fortiplex, to meet the simple needs of caring attendants.

1) Basement consist of:

Engineering and Biomedical department
Contractual Staff Dining
Materials and purchase department
PTS blower room
Stores: Pharmacy, kitchen & general stores
Radiation oncology
MRD
Mortuary
Nursing training room
Parking for staff and visitors

2) Lower ground floor consist of:

Radiology with:-

- Asia's first Ingina's 3 Tesla MRI
- 256 Slice CT scan with skylight

NIC
Nuclear medicine with PRT-CT & Gamma camera
Emergency
CSSD
In house Laundry
SRL's Open Laboratory
Swimming pool & Sauna and steam
60 OPDs for Oncology. Paediatrics, Orthopaedics, Neurology and other
Medical and Surgical OPDs
Staff entry, Fire control room
Mamamia

3) Upper ground floor consist of:

Spa, Salon & Fitness centre
'Health4U' Preventive health care
Retail therapy- Titan Eye Plus, Fila, Being Human, Chicco, Mom & Me,
Religare Wellness Pharmacy, Medimart,

Tummy Luck- Subway, Haldiram's, Whole Foods, Joost Food Ventures,
Baskin Robbins
Fortiplex- 36 seater Mini Theatre
VIP lounge
Mother and child, breast clinic and IVF
Kitchen
Administrative office

4) Clinical infrastructure:

Operation Theatres 11	NICU & Nursery 18
Cath Labs 2	Dialysis 11
LINAC 2	Chemotherapy 10
LDR 4	Pre & Post Cath 12
Delivery rooms 2	ER Beds 14
Endoscopy Suites 3	Labour Beds 14
Nightingale wards 40	Pre-OP 6
Double Bed Rooms 88	Pre & Post Endoscopy 5
Single Bed Rooms 47	ICU beds 98
Deluxe Rooms 8	Operating rooms 11
Suites 4	Operating beds 288
Signature Apartment 1	

5) First Second and Third Floor consists of:

Sr. No	Name	Details
1	Labour Delivery Room	4
2	Meditorium	111 seated auditorium
3	Nightingale Ward	40 bedded
4	High dependency Unit	9 beds
5	Dialysis unit	11 units
6	Chemotherapy unit	10 units
7	Inhouse Blood Bank	
8	Pathology Lab	
9	Rest & Relaxation Lounge	76 recliners & 31 cubicals
10	Neonatal ICU	13 units
11	Well baby Nursery	5 units
12	ICUs	8 ICUs
13	Clinical Information Portfolio (ICIP) OT	11 Modular Operating Rooms

SERVICE: Woven into the fabric of the hospital are innovative services, where every attempt has been made to look after our patrons so that they feel cared-for and special.
Angel: A welcoming face at the hospitality desk to make visitors feel special.
Genie: A friendly and helpful companion to assist patients navigates the hospital.
Concierge: A facilitation desk to assist patrons with various needs in and outside the hospital.

2.1 Vision

To be the ultimate healthcare destination - "Mecca of Medicine"

2.2 Mission

To provide quaternary care to the community in a compassionate, dignified and distinctive manner

2.3 Motto

"Best is the Least We Can Do"

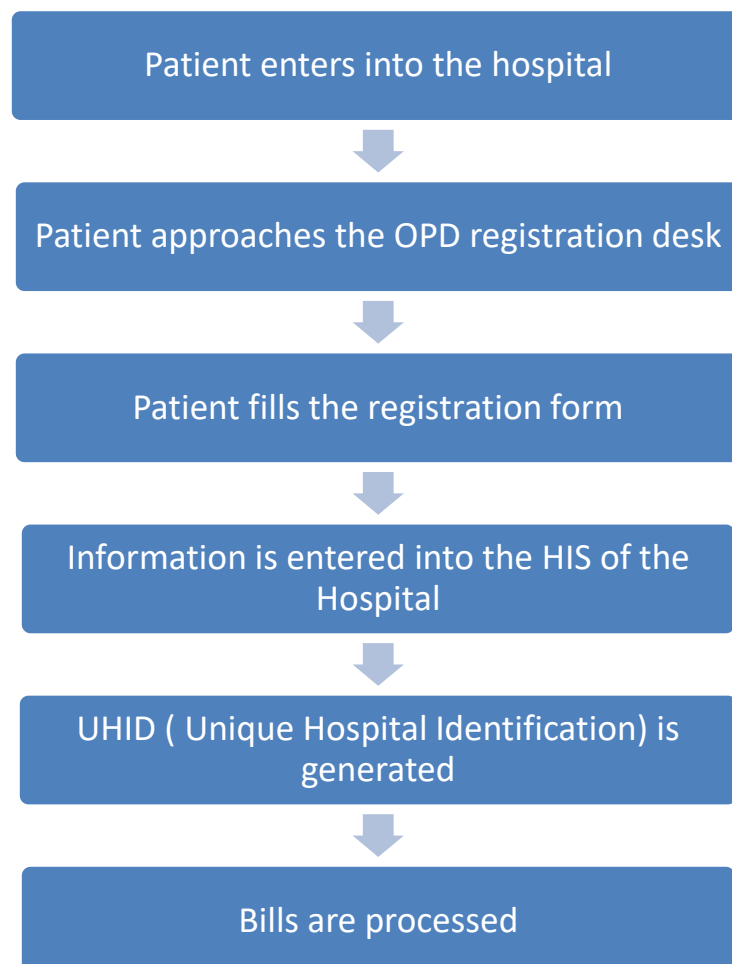
3. Departmental Profile

3.1. Out Patient Department:

Functions:

1. Reception
2. Information
3. Appointment
4. Registration – OPD, Diagnosis
5. Billing- OPD, Diagnostic, Emergency
6. Report/ Document Delivery
7. Customer Feedback

Registration Process of OPD



3.2. Human Resource Management

Functions:

1. Development of HR policies and Strategies
2. Manpower Planning
3. Recruitment and selection
4. Employee training
5. Salary Determination
6. Performance Appraisal
7. Personal data entry and record Maintenance
8. Consultation and advisory services to management and employees
9. Grievance handling

3.3. Medical Record Department

Functions:

1. Storage, Maintenance of medical records.
2. Maintenance of integrity and Confidentiality of medical records.
3. Submission of required data to the government.
4. Classify the medical files as per ICD-10.
5. Obtaining missing patient files

3.4. IT department

Functions:

It maintains all the software of the hospital. Modifications of the software are as per the requirement of the department. It covers the following modules

1. IPD billing
2. OPD billing
3. Administration
4. House Keeping
5. Ward/Nursing
6. Diet
7. Visitor's Pass
8. Store
9. Purchase
10. Laboratory Information System
11. Radiology Information System

4. Observational learning

4.1. Accident and Emergency Department (ED)

The emergency department in a hospital plays a very important role for all people who are in acute need of immediate care like chest pain , stroke , accident cases, trauma cases etc. the ED At FMRI is a 6 bedded along with 8 beds in observation room. Also, there is a procedure room to conduct simple surgical procedures.

ED has separate entry, far away from the general entry and is quite spacious in order to allow free movement of stretchers/ trolleys from ambulance to the emergency room.

While brining in the patient from the ambulance, TRIAGE is done beforehand by the staff nurse at the ER reception and so Patients are placed according to the triage beds:

The TRIAGE patterns followed here is:

- a) RED bed for category 1 Patient i.e. critically Ill
- b) Yellow Beds for category 2 Patients who need to be admitted
- c) Remaining category 3 patients are kept in Observation room

There are centralized ambulance systems in the Accident and emergency department, the movement of which depends on the central emergency call centre at FMRI. The Fortis group of hospital in Delhi NCR has a centralized ambulance call centre at Fortis Escorts, Okhla (105010) where all the calls for requirement of ambulance are received and depending on the location of the case, the nearby branch is contacted, a case ID is given and then the ambulance is sent to the location.

A crash Cart is available in the emergency which provides a one place storage of all emergency medications required which saves the precious time during treatment. A code blue team is designated which consists of four sub teams

- a) Critical care team
- b) Emergency Team
- c) Cardiology team
- d) Anaesthesia Team

Accessibility which other Departments:

The ER is located on the ground floor, making it quite accessible to the other departments, the diagnostic department is next right to the ER department but the ICU and OT are at the second floor and it takes 4-6 Minutes to reach there.

Moreover, there is a direct inter- communication system between ER department and other services like blood bank, Lab, Diagnostic, ICU etc. It is all linked thorough HIS and Intercom service

The Staff in the ER department are:

- a) Nurses
- b) Doctors
- c) CMO
- d) Paramedical staff
- e) Ground Staff- GDA/ Housekeeping

Generally the patient to nurse ratio is 1:1, but team work approach is always followed wherever the emergency patient arrives.

The emergency department has the following equipments per bed:

Defibrillator, Suction machine, ECG, Cardiac Monitor, Oxymeter, ventilator, Syringe Pump (for the accuracy of dosage)

4.2. Blood bank

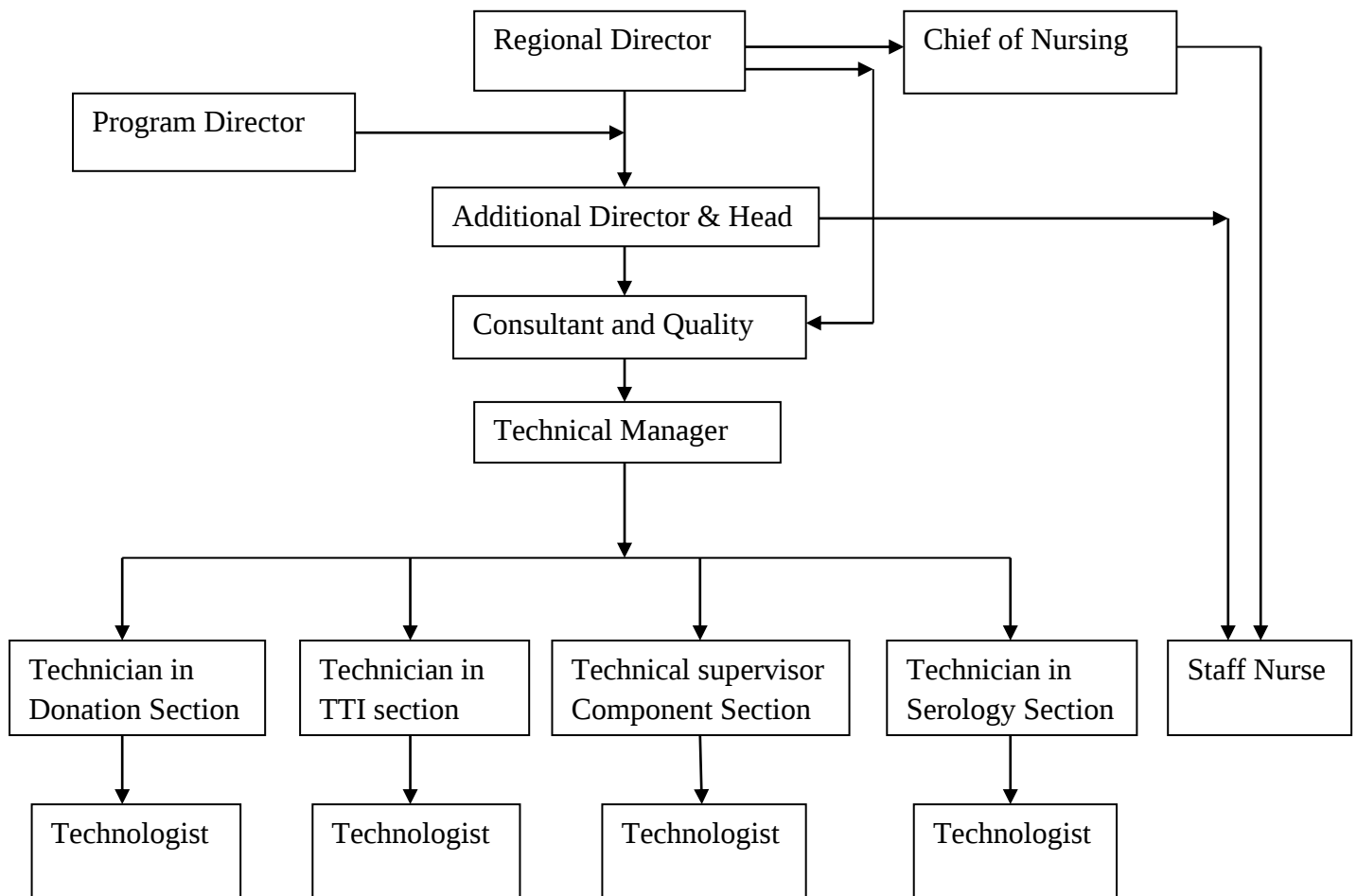
Blood is vital to human body and about 5.5 Lt is present in a person. It carries all nutrients, oxygen and metabolism throughout the body, but sometimes a life may be at stake due to blood loss/infection.

A blood bank is a collection and storage facility where blood is later used for blood transfusion. The term “Blood Bank” typically refers to a division of a hospital where the storage of blood product occurs and where proper testing is performed (to reduce the risk of transfusion related adverse events). However it sometimes refers to a collection centre and indeed some hospitals also perform collection.

LICENSE: Blood bank of FMRI, Gurgaon is located on the first floor. It has both NABH and NACO (National AIDS control organization) accreditation and was able to get the accreditation within six months of the functioning of the hospital. The blood bank has a valid license from Central Drugs Standard Control Organization (CDSCO) and approved by the Drug Controller General (India), central license approving authority under drug and cosmetic rules-1945 with further amendments.

The blood bank is run by the FMRI (a Fortis group Hospital) in order to provide blood and blood components to its patients and is licensed by the Drug Controller of India.

Organogram for transfusion Medicine Department



The blood bank area is of 181 square meters & has separate rooms each for:-

- Registration and medical examination room (air conditioned)- there are well lit rooms fully furnished with adequate number of chairs and examination table.
- Donor motivation and counselling area (Air conditioned) with a counsellor
- Blood donation area is a well lit and air conditioned room having three fully motorized donor couches and having computerized bar coding system for a donor data entry.
- Refreshment room (air conditioned).
- Component Preparation Room- Air conditioned room with maintained temperature of 20-25°C and humidity below 60% and having Quarantine refrigerator for untested blood.
- Lab for TTI markers is well lit air conditioned room having maintained temperature and humidity.
- Lab for blood group serology is air conditioned and having marked area for grouping and cross matching, antibody detection.
- Specific area for sterilization and washing.
- Store & record room

4.3. Laboratory

The laboratory here at Fortis Hospital is outsourced to SRL lab and all the routine investigations are carried out here only. The staff strength is 30-40 with 3 people during night. The samples are received from both OPD & IPD patients and a prescription is not always required to get a test done until unless the history of the patient has to be traced back. This sample is received in boxes from respective OPD & IPD department and the housekeeping staffs carry the same. Also for emergency investigations a red seal is marked on the sample as well as on the prescription of the patient so as to give it a priority. Also, all the equipment's in the lab are automated i.e. they are linked to computers and so all the test results are automatically transferred in the computer and report is generated. The laboratory has laboratory Investigation System (LIS). This LIS is connected to the HID of the hospital in which all the information like Patients name IPID or UHID, test to be done and the reports stored. Once the report is generated, it is reviewed by the authorized person and then only it is made available in the LIS or is sent to the patient. Moreover, there is no telephonic communication of reports result, only during urgent or emergency cases report is spelled out and that too twice to ensure proper communication. Quality check and the calibration of the equipments are carried out twice in a day for quality assurance. Also, to maintain employee safety i.e. to prevent occupational hazard, when an infected sample or any chemical bottle breaks in the laboratory, HAZMAT (Hazardous Material) team is called and immediately the spillage is cleaned up.

List of Equipments used in laboratory are:

Biomedical analyzer, Cell counter, Urine routine analyzer, Immuno assay analyzer, Centrifuge, Microscan, Bactec, Tissue Processor, Microtone Balance Glycosylated Haemoglobin analyzer (D10), Sample mixer, Microscopes, Pipettes

4.4. CSSD

CSSD stands for Central Sterile Supply Department. It is the department that is solely responsible for sterilization of all the instruments used all over the hospital.

CSSD has 3 zones:

- Dirty/ Receiving area
 - Clean Area
 - Sterile Area
- a) In Dirty area all used instruments from around the hospital are received after they are washed and cleaned. This movement takes place manually, while it is received through a dumb waiter from the OT. Here an ultrasound cleaner is located. This is a fully automated machine in which the used instruments are dipped in a solution and

are sterilized under 40° Celsius for 15-20 minutes. This machine produces vibrations which sterilizes the instruments. After the above procedure is over the sterilized instruments are washed under running water. After this the instruments are dipped in preserve solution for 10-15 minutes.

- b) In clean are the sterile instruments are kept packed in a double wrapped green colour cloth.
- c) In Sterile are there is one autoclave machine that is used to sterilize the used instruments. It is a double door machine. Through one door the used instruments are loaded and through other door the instruments is de loaded after the procedure is over.

Two temperatures are set in this machine according to the instruments to be sterilized:

1. 120° Celsius- Under this temperature 20 minutes is the sterilizing time, 15 minutes is the dry time and 3 minutes is the pulsing time (pulsing time is a procedure by which the air present in the machine is moved out and steam is brought in).
2. 134° Celsius- Under this temperature. 7 minutes is the sterilization time, 3 minutes is the pulsing time and 10 minutes is the dry time.

After the sterilization process is over, the sterilization process is over, the sterilized instruments are packed and batch monitoring and labelling is done through a labelling gun. This labelling consists of:

- Expiry Date
- Packaging Date
- Machine Number
- Loading Number
- Sterilization Date

4.5. ICU (Intensive Care Unit)

ICU is located at the second floor of the IPD building making it accessible to all the outside services like lab, Diagnostics, OT's etc.

These are 7 different types of ICU's in the hospital which are as follows:

- Neurology, Orthopaedic, Polytrauma
- Cardiology & transplant
- CTVS
- Medical ICU
- Bone Marrow Transplant
- Paediatric ICU

- NICU

The nursing station is centrally located in the ICU and the Nurse to patient ratio in ICU is 1:1.

Also, here at FMRI, Barrier nursing is practiced in ICU's so as to minimize the risk of the Hospital Acquired Infection (HAI).

Equipments used in ICU:

- Ventilator
- Intra Aortic Balloon Pump (IABP)
- Suction
- Inter Costal Drainage System (ICD)
- Portable Ultrasound (if needed)
- DVT Pump (Deep Vein Thrombosis)
- Bi-pap to give oxygen to the patient

There are 98 beds out of which 52 are ventilator equipped and 6 are isolation beds.

Quality Indicators are:

- CRBSI
- VAP
- SSI
- Returned to ICU within 48 hours
- Needle stick Injury

4.6. Operation Theatres

The operation theatres are located on the 2nd floor of the OPD building having a direct connectivity with ICU (2nd floor if IPD building) so that patient can be easily & quickly shifted to and from ICU.

At FMRI, there are 11 OTs:

- OT 1 – Orthopaedics and Liver Transplant OT
- OT 2 & OT 3- Neurosurgery OT
- OT 4- Major & general (All cleaned & Planned cases are dealt)
- OT 5- Cardiac & Transplant
- OT 6- Planned, cleaned & emergency Cases
- OT 7- MIS (infected minor, Day care & emergency Cases)
- OT 8- Minor Surgeries

Zoning- Zoning is basically segmenting OT area according to the hygiene maintained in Different zones, here three different zones were observed:

- 1) Dirty Zone: Outside corridor, changing room
- 2) Clean Area: supply store, scrub Area, Pre-operative room
- 3) Aseptic Zone: OT, Sterile Preparation

This Zoning very essential in OT's as it helps to prevent Infection

Infection Control in OTs:

OT being such a sensitive area of a hospital, proper infection control mechanisms need to be followed in there. So, for the same, after every surgery they mop & clean the OT with 0.4% Virex & for fogging of OT they use they use 1% Virex for infected cases they use 2% virex.

Also, to maintain proper hand hygiene there are 3 scrubbing sections:

- 1) Scrubbing station 1 is in between OT 6 & 7
- 2) Scrubbing station 2 is in between OT 4 & 5
- 3) Scrubbing station 3 between OT 1 & 2

For hand washing and scrubbing, Micro shield & Betadiene scrub is used. Sterilization of instruments CSSD is there where all the instruments are properly sterilized and send back to the OT. To make this process more effective, a DUMB WAITER is used which is a lift which connects CSSD and OT.

The used instruments are first cleaned in instrument processing room in OT

It is then packed in a double wrapped green cloth. This pack is placed on the dumb waiter in dirty area of OT. It is received on the dumb waiter in dirty area of CSSD. Then it is sterilized, packed in the CSSD and a biological indicator is placed in the pack. It is the send from the dumb waiter in sterile area of CSSD. It is received in the dumb waiter in sterile area in OT.

Moreover for equipments required during emergency in OT an autoclave and ultrasound machine is there wherein the instruments are sterilized and used. The surgeries are generally conducted from 8:00 AM to 8:00 PM, except in the cases of emergency. Also, the Time duration for a patient to be kept in pre-operative room is half an hour and one hour for past op room. This is as per the FOS, but it may vary with the severity of the case.

4.7. Radiology

- Asia's first ingina's 3 Tesla MRI
- 256 Slice iCT scan with skylight
- 5 ULTRASOUND MACHINE:
 - 2 ultrasound machines on upper ground floor
 - 1 ultrasound machine in health4U
 - 1 Ultrasound machine in gynaecology department
- 3 X-ray machine (Philips, mesems)
- 3 Portable X Ray machines
- 1 CT scan (256 slices) iCT Philips
- 3 Tesla MRI machine
- 1 CRI
- 1 Mammography
- 1 Bone Densometry
- 3 Printers
- 1 Technologist room
- 1 Reporting room
- X Ray Console room
- 1 patient lounge
- 1 HOD room
- 1 fluoroscopy room
- 2 changing room

Manpower:

- 1 Chief technician
- 1 Supervisor
- 17 Technicians

**Project Report: To study the compliance of the Surgical Team to
Hospital Wide Policy for the prevention of Surgical Site Infections**

INTRODUCTION:

It was not until the late 1860's, that Joseph Lister introduced the principles of antisepsis that decreased postoperative infectious morbidity and mortality substantially. Lister's work radically changed surgery from an activity associated with infection and death to a discipline that could eliminate suffering and prolong life. Infections that occur in the wound created by an invasive surgical procedure are referred to as surgical site infections (SSIs). Surgical site infections are probably the most preventable of the health care-associated infections.

The practice of surgery is very demanding—patients must be scheduled, supplies ordered, staff issues dealt with, and numerous other details must be worked out each and every day. With such a high level of activity, there is a tendency to cut corners to fit everything in to the daily schedule; unfortunately, when this occurs, something is compromised. In the area of infection control, any lack of compliance with published guidelines can result in a significant risk for SSIs, disease transmission and patient safety. The lack of adherence to hospital protocols by the staff is not uncommon and has been the major reason for the increasing number of Surgical Site Infections.

Despite the widespread international introduction of level I evidence-based guidelines for the prevention of SSIs, such as that of the National Institute for Clinical Excellence (NICE) in the UK and the Surgical Care Improvement Project of the USA, Centres for Disease Control and Prevention, SSI rates have not measurably fallen.

The vast body of literature addressing the prevention of the incidence of SSIs have been summarized and published in several international guidelines to properly direct physicians and other health care providers in their clinical decision making by describing the generally accepted approaches for the prevention of surgical site infection. But these guidelines have not been followed judiciously. Noncompliance is an ongoing issue. It may be due to negligence of the health care provider or due to poor knowledge or incomplete understanding of guidelines or universal precautions by them. Evidence exists that compliance to the guidelines for prevention of surgical site infection, reduces the risk and cases of SSIs.

LITERATURE REVIEW:

Infections that occur in the wound created by an invasive surgical procedure are generally referred to as surgical site infections (SSIs). SSIs are one of the most important causes of healthcare-associated infections (HCAIs). A prevalence survey undertaken in 2006 suggested that approximately 8% of patients in hospital in the UK have an HCAI. SSIs accounted for 14% of these infections and nearly 5% of patients who had undergone a surgical procedure were found to have developed an SSI. However, prevalence studies tend to underestimate SSI because many of these infections occur after the patient has been discharged from hospital.

SSIs are classified as being either incisional or organ/space. Incisional SSIs are further divided into those involving only skin and subcutaneous tissue (superficial incisional SSI) and those involving deeper soft tissues of the incision (deep incisional SSI). Organ/space SSIs involve any part of the anatomy (e.g., organ or space) other than incised body wall layers that was opened or manipulated during an operation.

A. Superficial Incisional SSI

Infection occurs within 30 days after the operation and infection involves only skin or subcutaneous tissue of the incision and at least one of the following:

1. Purulent drainage, with or without laboratory confirmation, from the superficial incision.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
3. At least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat and superficial incision is deliberately opened by surgeon, unless incision is culture-negative.
4. Diagnosis of superficial incisional SSI by the surgeon or attending physician. Do not report the following conditions as SSI: 1. Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration). 2. Infection of an episiotomy or newborn circumcision site. 3. Infected burn wound. 4. Incisional SSI that extends into the fascial and muscle layers (see deep incisional SSI).

B. Deep Incisional SSI

Infection occurs within 30 days after the operation if no implant is left in place or within 1 year if implant is in place and the infection appears to be related to the operation and infection involves deep soft tissues (e.g., fascial and muscle layers) of the incision and at least one of the following:

1. Purulent drainage from the deep incision but not from the organ/space component of the surgical site.

2. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms: fever ($>38^{\circ}\text{C}$), localized pain, or tenderness, unless site is culture-negative.

3. An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination.

4. Diagnosis of a deep incisional SSI by a surgeon or attending physician.

Infection that involves both, superficial and deep incision sites or an organ/space SSI that drains through the incision could be reported as deep incisional SSI.

C. Organ/Space SSI

Infection occurs within 30 days after the operation if no implant is left in place or within 1 year if implant is in place and the infection appears to be related to the operation and infection involves any part of the anatomy (e.g., organs or spaces), other than the incision, which was opened or manipulated during an operation and at least one of the following:

1. Purulent drainage from a drain that is placed through a stab wound into the organ/space.

2. Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.

3. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination.

4. Diagnosis of an organ/space SSI by a surgeon or attending physician.

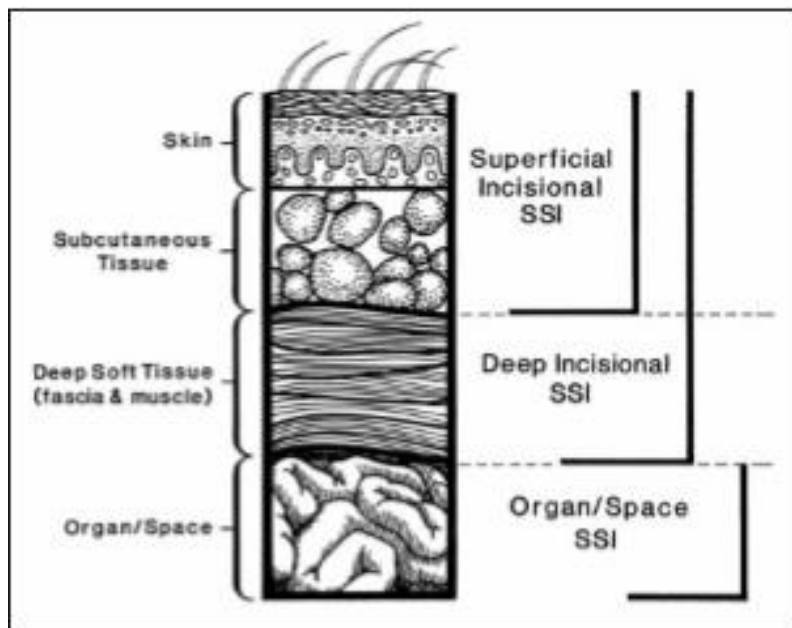


FIGURE. Cross-section of abdominal wall depicting CDC classifications of surgical site infection.²²

- 1) SSI is associated with a mortality rate of 3%, and 75% of SSI-associated deaths are directly attributable to the SSI.⁽¹⁾
- 2) Surgical site infections make up approximately one-fifth of Health care-associated infections (HCAIs), and at least 5% of patients undergoing open surgery develop an SSI. Surgical site infections are probably the most preventable HCAI but have been neglected time and again.⁽²⁾
- 3) In a baseline U.S. study, selection of the right antibiotic was averaged at 64%, the right timing of antibiotic administration within 60 min of skin incision was at 83%, and cessation of surgical antibiotic prophylaxis within 24 h was at 44%.⁽³⁾
- 4) Kirkland et al. showed that patients who developed SSI have 60% more chances of prolonged intensive care unit stay, fivefold increased risk of readmission to the hospital and two-times higher rate of mortality compared to patients who had no SSI.⁽⁵⁾

NEED FOR STUDY:

While advances have been made in infection control practices, including improved operating room ventilation, sterilization methods, barriers, surgical technique and availability of antimicrobial prophylaxis, SSIs remain a substantial cause of morbidity, prolonged hospitalization and death. SSI is associated with a mortality rate of 3%, and 75% of SSI-associated deaths are directly attributable to the SSI. Nosocomial infections are, by far, the most common complications affecting hospitalized patients. Among these, surgical site infections constitute the second most common category of adverse events—approximately 20 percent of all nosocomial infections—and rank third with respect to cost. There is a huge gap between the protocols followed by the staff of the hospital and that of the guidelines given by Centres of Disease Control and Prevention, 1999.

The goal of compliance monitoring is to confirm accurate and consistent protocol performance in a collegial and unobtrusive manner.

The care bundle approach is an accepted method of packaging best, evidence-based measures into routine care for all patients and common to many guidelines for the prevention of SSI. This includes methods for preoperative removal of hair (where appropriate), rational antibiotic prophylaxis, avoidance of perioperative hypothermia, management of perioperative blood glucose, effective skin preparation and many more. This care bundle, when not followed, has lead to increase in cases of SSIs. There is a huge non compliance by the health care workers on this front. Only after observing the degree and reasons of noncompliance, measures to improve compliance by the health care workers could be formulated to prevent SSIs and hence the morbidity caused by them.

Factors that increase the acquisition of SSIs in any healthcare setting include:

- The lack of compliance to the recommendations as per the guidelines of CDC.
- Breaches in evidence-based infection prevention practices.
- The tendency to cut corners by existing staff.
- The growing volume of patients admitted in acute-care hospitals.
- The growing shortage of healthcare professionals.
- The persistence of some bacteria and viruses on inanimate objects and surfaces for days, weeks, and months.
- Poor sanitation in healthcare facilities.

The compliance to the guidelines is the most critical factor to prevent SSI.

RESEARCH QUESTION: What is the compliance of surgical team to hospital wide policy for the prevention of surgical site infection?

OBJECTIVE: To study and analyse the compliance of surgical team to hospital wide policy for the prevention of surgical site infection.

METHODOLOGY:

Study Design: Observational study- Prospective.

Study population: All the in patients, undergoing surgery between 9th April and 13th May 2015 in Fortis Memorial Research Hospital, Gurgaon.

Study Area: 288 bedded FMRI (11 Operation Theatres)

Sample Method: Simple Random Sampling.

Sample Size: 45

Sampling Criteria: Departments were shortlisted according to the prevalence of SSI in the last year. Specific sample of surgeries were observed in the shortlisted departments, observing 2-3 surgeries per day for 35 days. From the population few patients and surgeries were excluded. These were:

- Paediatric patients (below the age of 18 years)
- Emergency surgeries
- Cardiac surgeries
- MTP cases

Data Collection Tool: A checklist was prepared as per the ‘Guidelines for Prevention of Surgical Site Infection-1999’ (Annexure 2). It consisted of preoperative, intraoperative and postoperative measures to prevent surgical site infection. The checklist had 32 parameters and was used for all the cases.

Data Collection Time: 9th April to 13th May 2015.

Variables:

<u>Preoperative</u>	<u>Intra-operative</u>	<u>Postoperative</u>
Hair removal and technique	Environment of OT	Sterility of dressing
Serum blood glucose & HbA1c levels	Sterilization assurance	
Antiseptic showering	Surgical attire and drapes	
Part preparation- solution, technique & time	Asepsis and surgical techniques	
Hand/forearm antisepsis	Patient's parameters	
Management of infected personnel		
Administration of prophylactic antibiotic		
Compliance with AMS protocol		

Data Collection Techniques:

A standardized self-administered questionnaire was used as the instrument to collect information from the participants.

All the surgeries were witnessed and observed as per the checklist prepared, according to the Guidelines for Prevention of Surgical Site Infection, 1999.

Preoperative measures were observed in the ward and preoperative area before the patient reached the Operation Theatre.

Intraoperative measures were observed in the operation theatre (OT).

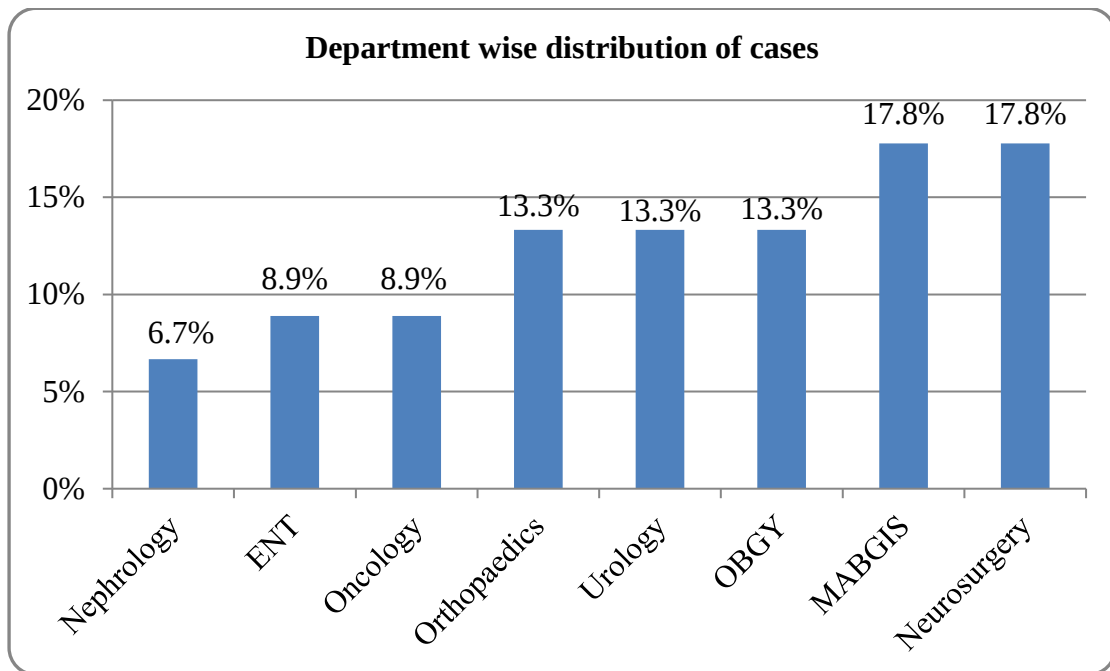
Postoperative measures were observed after the patient was shifted from OT to ward.

The data for each case was gathered through different means:

- Observing the patients in the ward and pre operative area.
- Observing the surgeries.
- By studying the files.
- By interviewing the nurses.
- By referring to AMS-SOP of the hospital.

OBSERVATIONS AND ANALYSIS:

Department wise distribution of cases:



- A total of 45 surgeries were taken as sample.
- 4-5 surgeries from all specialties were observed for all the variables.
- The following table shows the distribution of cases (department wise).

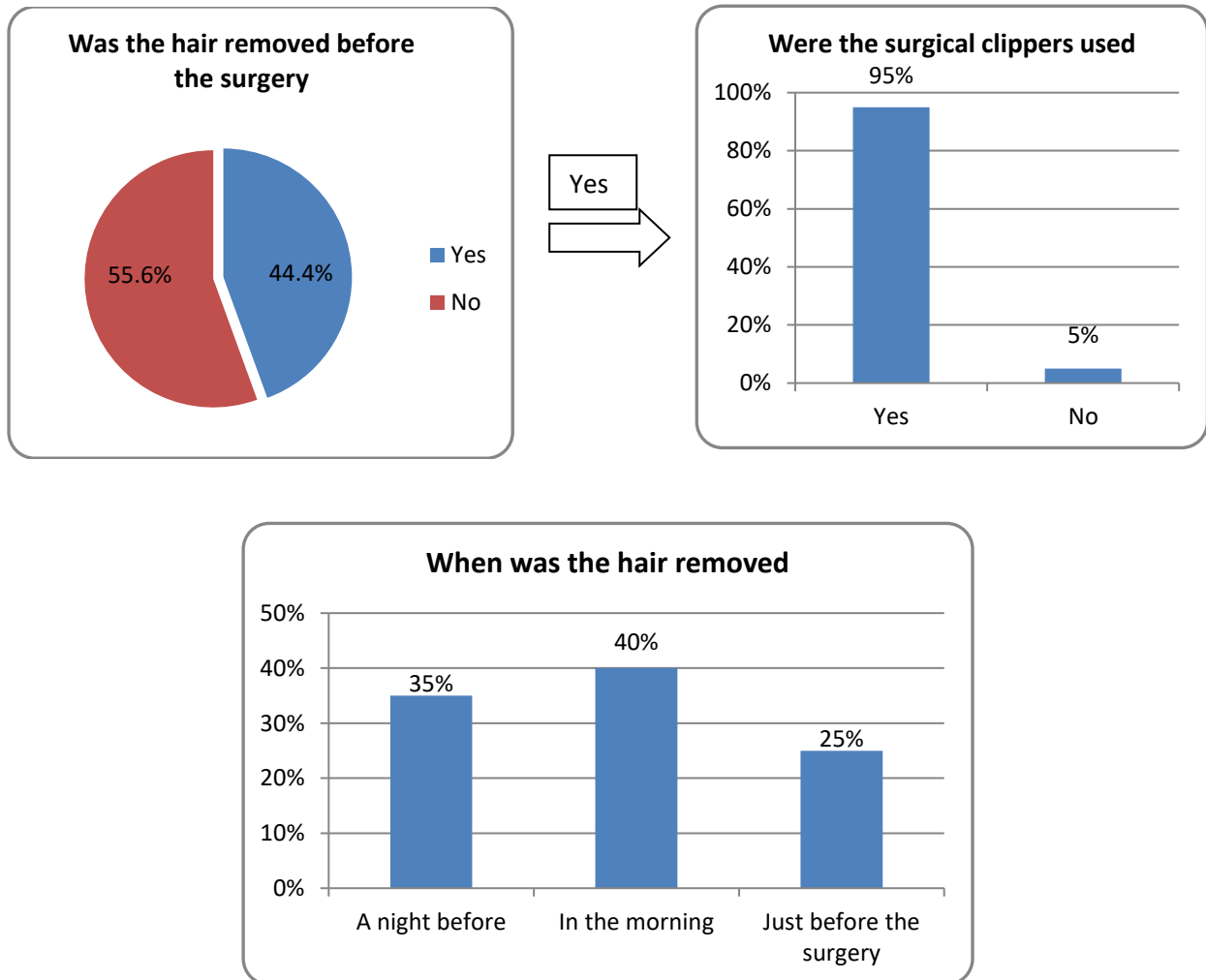
Department	Cases
Nephrology	3
ENT	4
Oncology	4
Orthopaedics	6
Urology	6
Obstetrics & Gynaecology	6
MABGIS	8
Neurosurgery	8
Total	45

1. To analyze the compliance to preoperative measures

A) Preoperative Hair Removal and Technique

GUIDELINE:

Preoperative shaving of the surgical site the night before an operation is associated with a significantly higher SSI risk than either the use of depilatory agents or no hair removal. Clipping hair immediately before an operation also has been associated with a lower risk of SSI than shaving or clipping the night before.



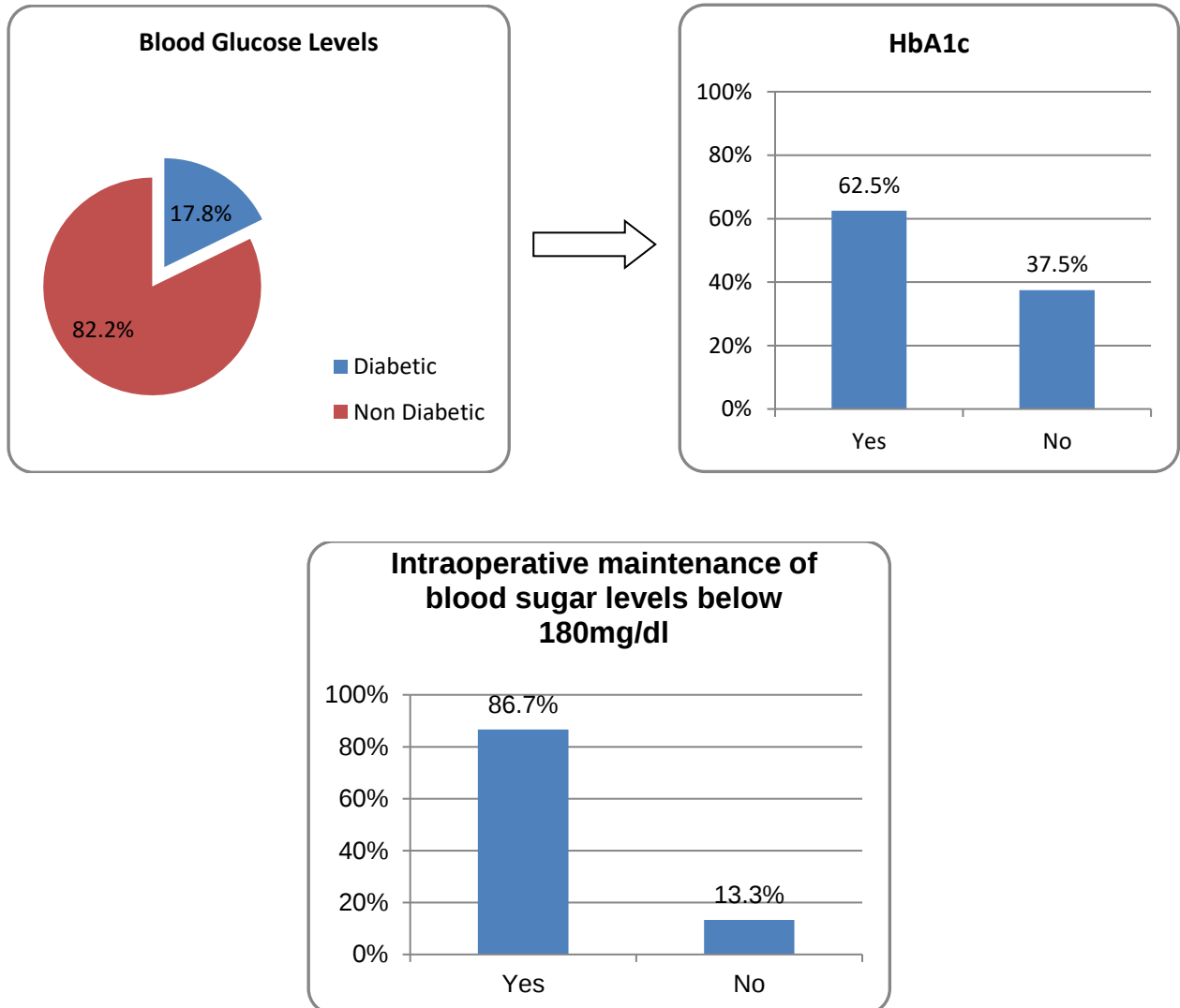
INTERPRETATION:

- Preoperative hair removal was done in 55.6% cases.
- 5% of cases reported to hospital clean shaven, hence not applicable for next parameter.
- In 95% cases, which were applicable, hair was removed using surgical clippers, giving a compliance of 100%.
- In 25% cases hair removal was done just before the surgery, and in 40% cases in the morning

B) Serum Blood Glucose and HbA1c levels

GUIDELINES:

- Patients with high blood glucose levels are associated with increased risk of surgical site infection.
- A high level of HbA1c increases the risk of developing SSI.
- Increased blood glucose levels (>180mg/dl) during any procedure also predisposes the patient for developing SSI.

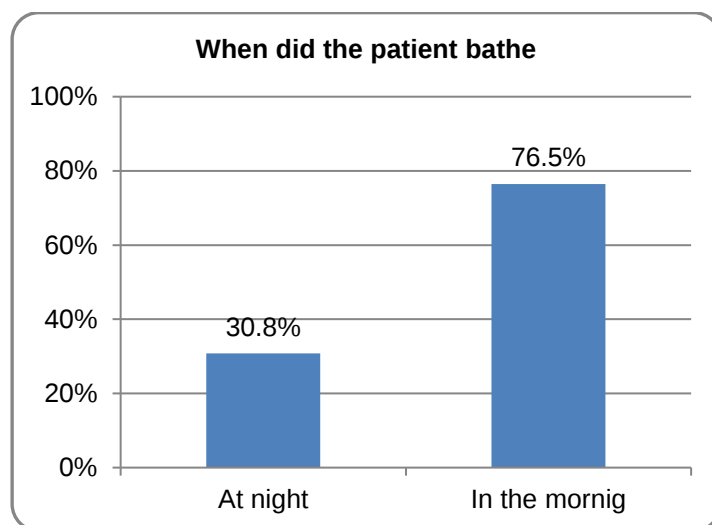
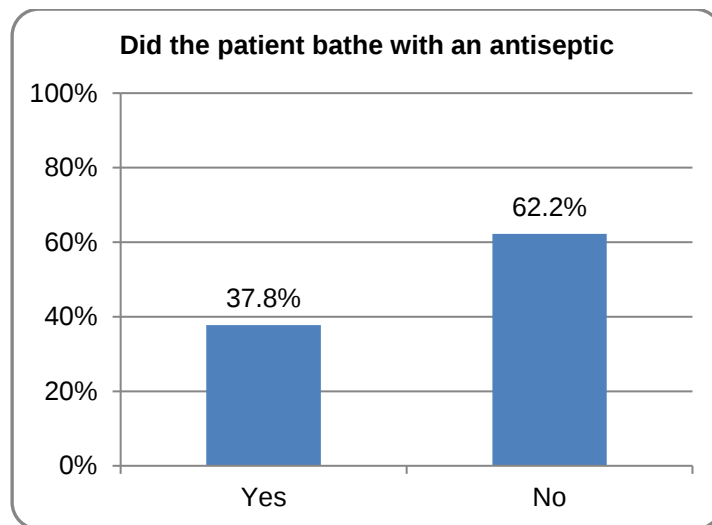


INTERPRETATION:

- Out of 45 cases, 17.8% (8 cases) were diabetics.
- HbA1c levels were checked for 62.5% (5 cases). The levels of HbA1c were high in all the cases, still surgery was done.
- Intra-operative blood sugar levels were maintained in 86.7% cases (irrespective of the duration of the surgery).

C) Preoperative Antiseptic Showering

GUIDELINES: Preoperative antiseptic showering reduces the risk of SSI up to nine folds.



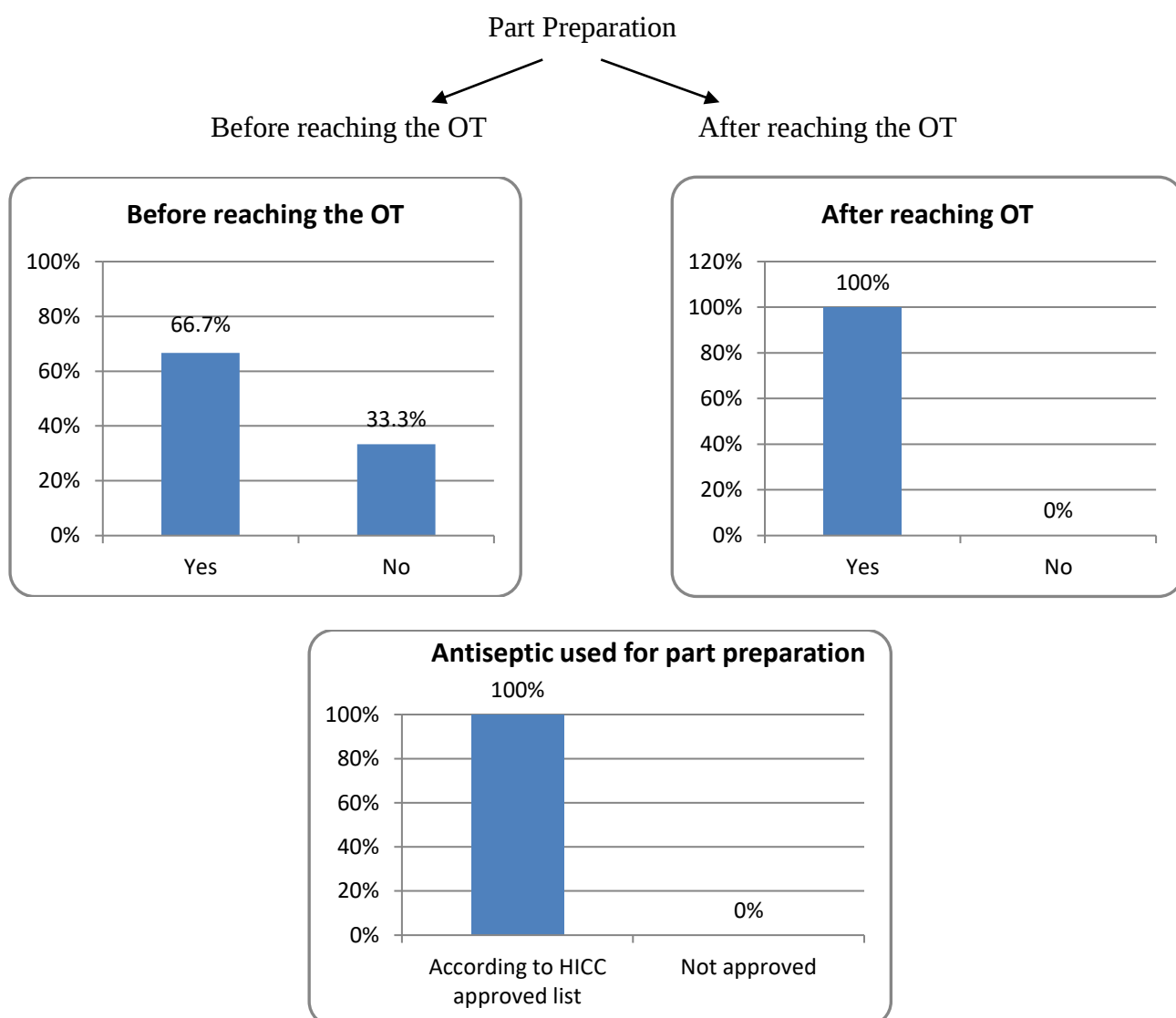
INTERPRETATION:

- Out of 45 cases, only 37.8% showered with an antiseptic solution before the surgery.
- 30.8% cases showered a night before and the rest in the morning before the surgery.

D) Preoperative Part Preparation and solution & technique

GUIDELINES:

- Part preparation before the surgery reduces the risk of developing SSI.
- Only HICC approved agents should be used for part preparation.
- Part preparation is done in concentric circles or starting from incision site to the periphery.



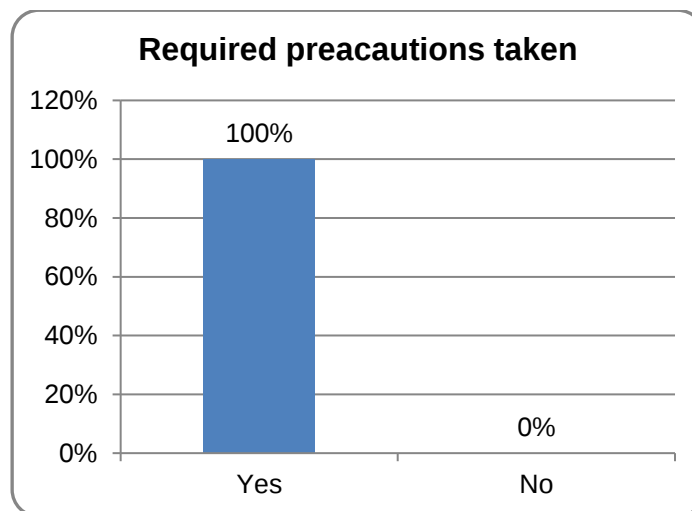
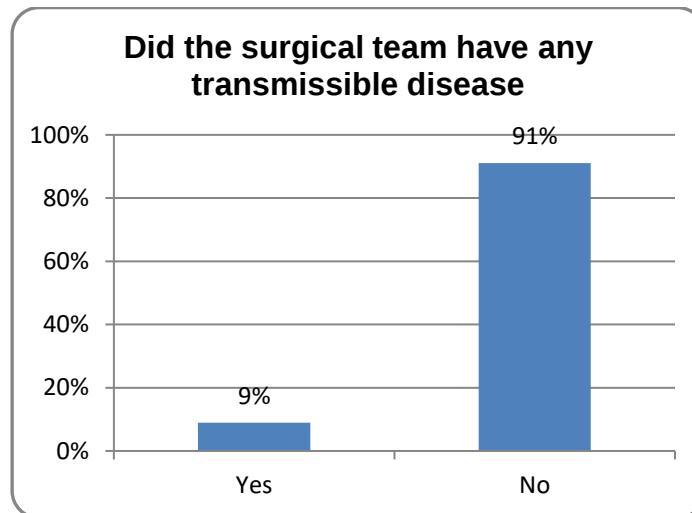
INTERPRETATION:

- Before reaching the OT, part preparation was done in 66.7%
- After reaching the OT, compliance for part preparation was observed in 100%.
- The antiseptic used for part preparation was 100% according to the HICC approved list.
- The part preparation was done as per the recommended guidelines that are in concentric circles/ from centre to periphery.

E) Management of infected personnel

GUIDELINES:

- When having any transmissible disease, the surgeon must take an off or not perform any surgery as it increases the risk of SSI.
- The surgeon and the surgical team must take appropriate precautions when having any transmissible disease.



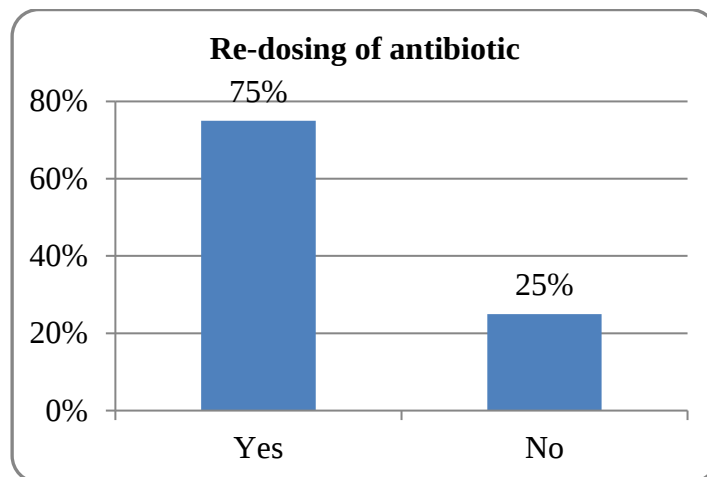
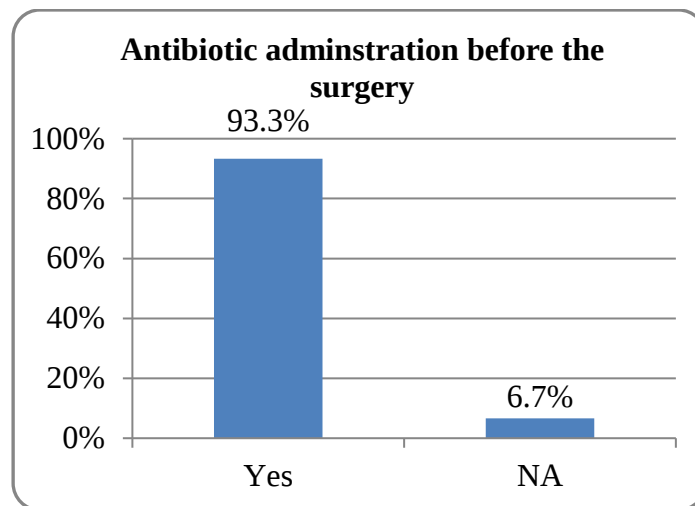
INTERPRETATION:

- Out of 45 cases, in 9% (4 cases) the surgical team had some transmissible disease (cough & cold).
- Required precautions were appropriately taken in all as they were wearing surgical masks.

F) Administration of prophylactic antibiotic

GUIDELINES:

- Prophylactic antibiotic must be administered before each surgery to reduce the risk of SSI.
- Re-dosing of antibiotic must be done if the duration exceeds 4 hours.



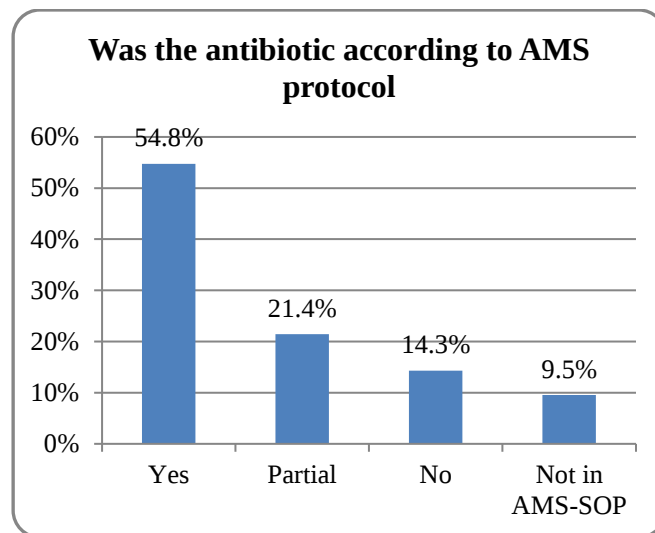
INTERPRETATION:

- Prophylactic antibiotic was administered in 93.3% cases, but the compliance remains 100% as it was not applicable in 6.7% cases.
- Re-dosing of antibiotics was not applicable in 91.1% of the cases observed and compliance of 75% was observed in applicable cases.

G) Compliance to AMS (Antimicrobial Stewardship) protocol

GUIDELINES:

- According to the AMS protocol, Cefalosporins must be given.
- If a patient is allergic to penicillin, Vancomycin/ Clindamycin could be given.



INTERPRETATION:

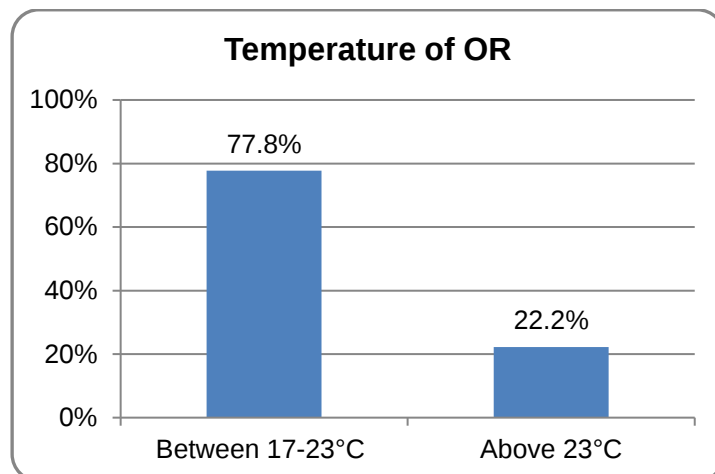
- Compliance observed was 54.8%.
- Partial compliance was observed in 21.4%
- In 14.3% antibiotics were not given as per the protocol of the hospital.
- 9.5% was not in AMS protocol.

2. To analyse the compliance to intra-operative measure:

A) Environment of OR:

i. Temperature of OR:

GUIDELINES: Temperature of operating room must be between 17 and 23°C as per hospital policy.

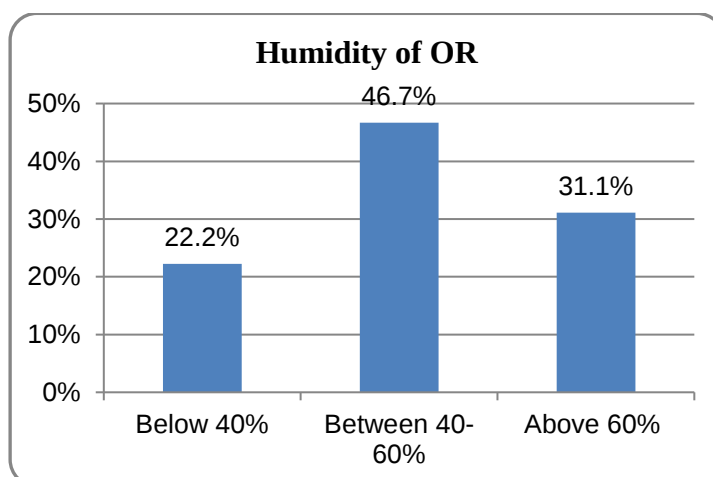


INTERPRETATION:

- Compliance observed was 77.8%.

ii. Humidity of OR:

GUIDELINES: Humidity must be between 40-60% as per hospital policy.



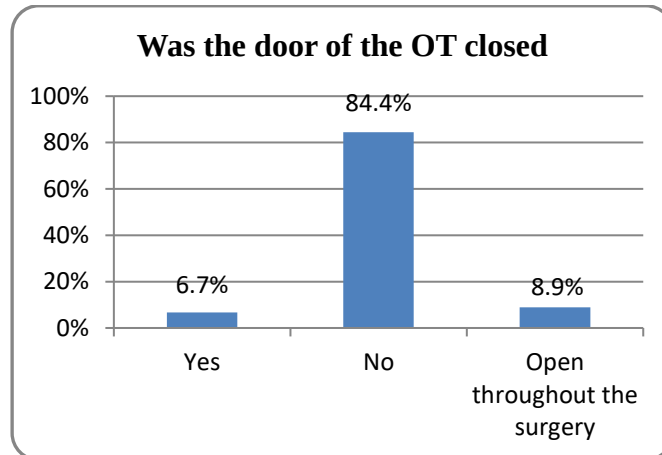
INTERPRETATION:

- Compliance observed was 46.7%.

B) Doors of OR (Zone-3)

GUIDELINES:

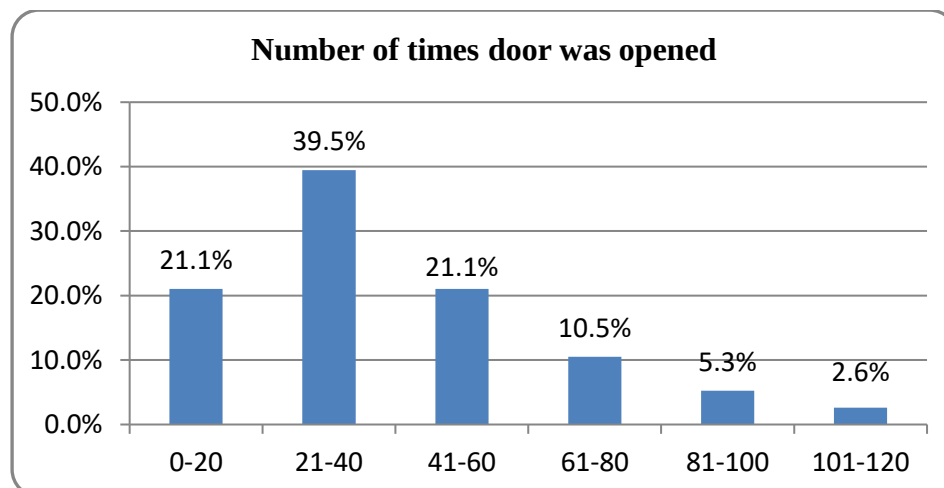
Door of OR must be kept closed. Door could be opened only for passage of patients, equipments and surgical team



INTERPRETATION:

- Only in 6.7% doors were kept closed throughout the surgery.
- In 8.9% the door was kept open throughout the surgery.
- In 84.4% the door was opened many times as depicted in the next graph.

Number of times door was opened:



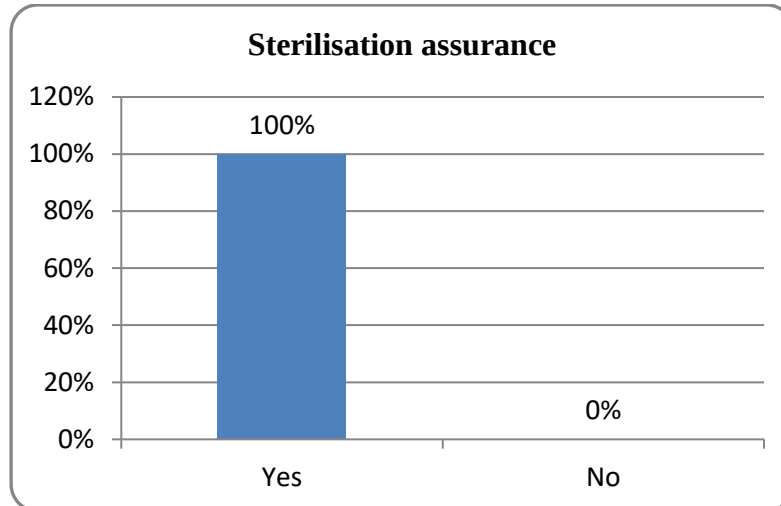
INTERPRETATION:

- On an average, the opening of door was observed to be between 21-40 times.
- The trend observed was that the opening of doors increased till 21-40th interval, being the highest in this interval, and then decreased gradually till the last interval.
- Maximum number of times the door was opened was 116.

C) Sterilisation Assurance:

GUIDELINES:

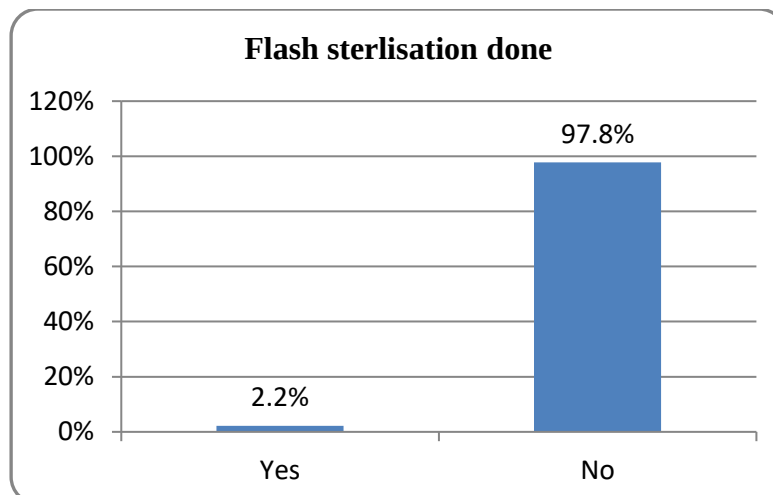
Inadequate sterilisation of surgical equipments results in SSI outbreak.



D) Flash sterilisation:

GUIDELINES:

Perform flash sterilization only for patient care items that will be used immediately (e.g., to reprocess an inadvertently dropped instrument). Do not use flash sterilization for reasons of convenience, as an alternative to purchasing additional instrument sets, or to save time.



INTERPRETATION:

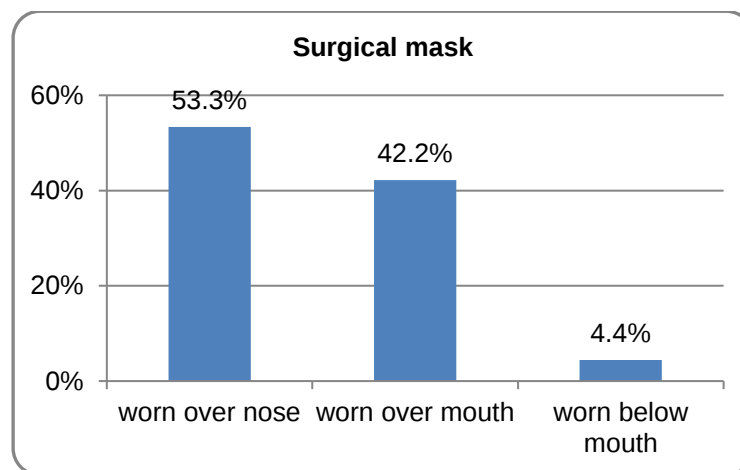
- The compliance to sterilisation assurance observed was 100%.
- The compliance of non usage of flash sterilisation was 97.8%.

E) Surgical attire and drapes:

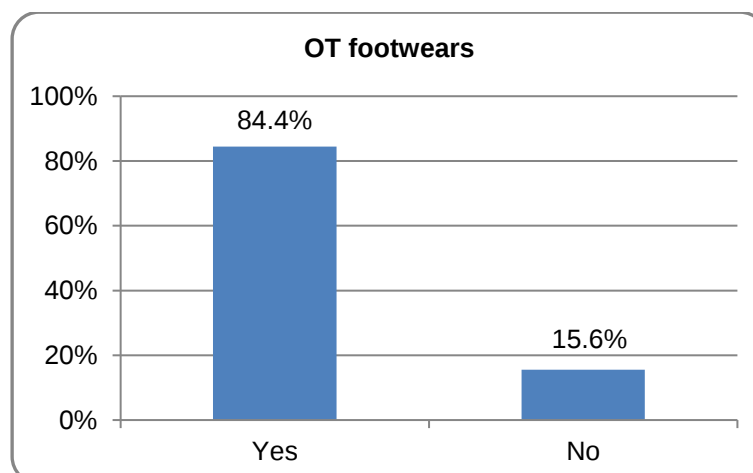
GUIDELINES:

- Wearing of surgical masks during operations prevent potential microbial contamination, hence SSI is prevented.
- OT foot wears protect the surgeons from potential infections in OR.
- Head caps reduce contamination of surgical field by organism shed from the hair and scalp, and hence SSI is prevented.
- All the members of the surgical team must wear sterile gloves to prevent SSI.

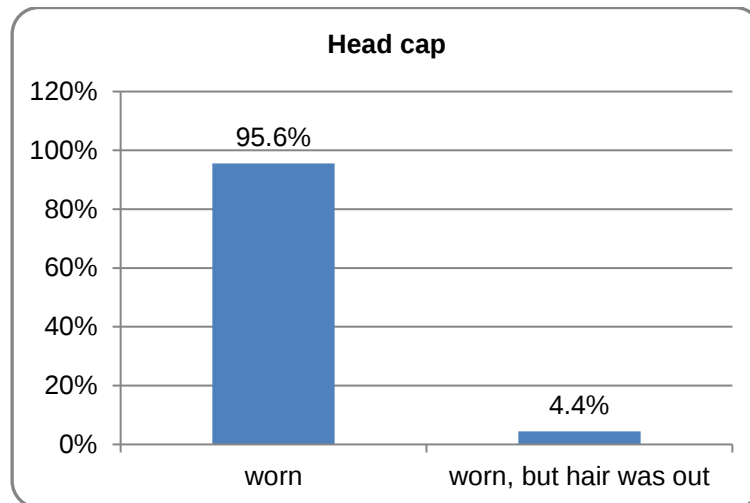
I. Surgical mask:



II. OT foot wears:



III. Head caps:



INTERPRETATION:

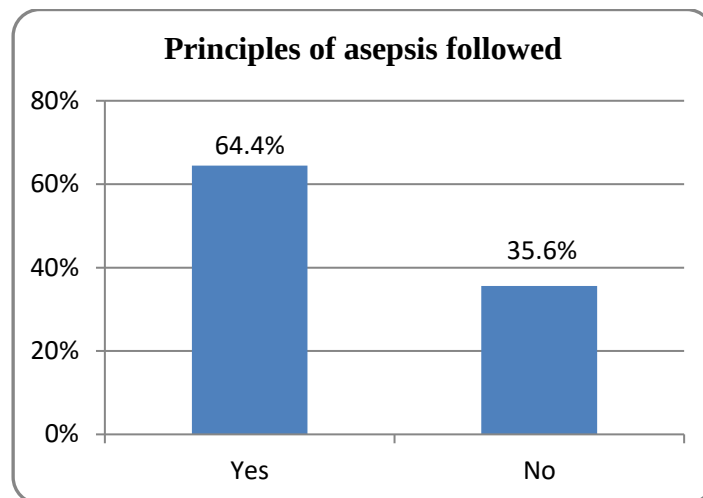
- Compliance to wear surgical mask observed was 53.3%. In 42.2%, mask was not worn over the nose.
- Proper OT foot wears were worn in 84.4% cases.
- Compliance to wear head cap was observed to be 95.6%, as in 4.4% the surgeons were wearing head caps but their hair was out of it.
- All the members of surgical team wore sterile gloves, giving a compliance of 100%.

F) Asepsis and surgical techniques:

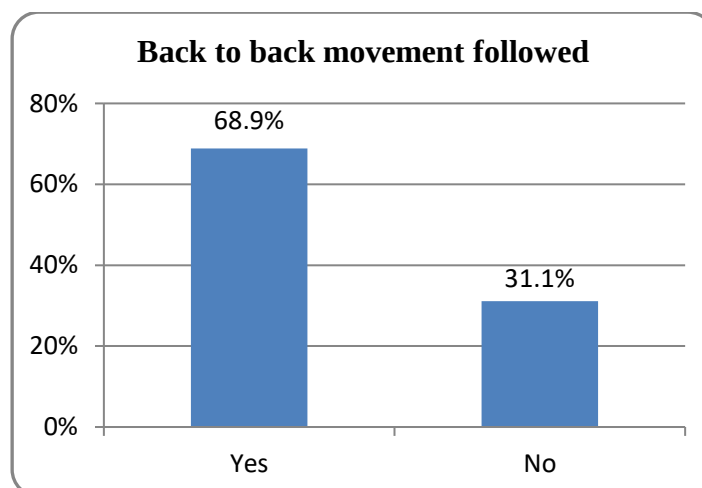
GUIDELINES:

- Rigorous adherence to the principles of asepsis by all scrubbed personnel is the foundation of surgical site infection prevention.
- Back to back movement must be thoroughly followed while changing positions to prevent SSI.
- Placement of drain, whenever required, must be done through a separate incision.

I. Principles of asepsis:



II. Back to back movement:



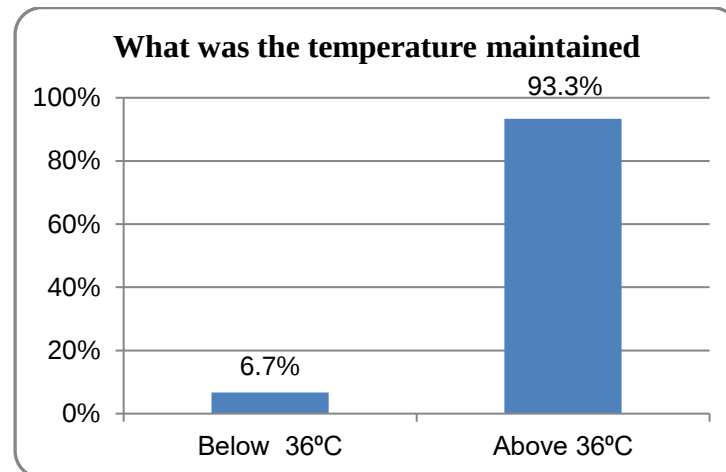
INTERPRETATION:

- In only 64.4%, principles of asepsis were judiciously followed.
- Back to back movement was followed in only 68.9%.
- Compliance to placement of drain through separate incision was observed in 100%.

G) Patient's parameters:

GUIDELINES:

- Even mild hypothermia ($<36^{\circ}\text{C}$) is associated with increased incisional SSI, so must be prevented.
- Intra-operative high blood glucose levels ($>180\text{mg/dl}$) are associated with increased risk of SSI.



INTERPRETATION:

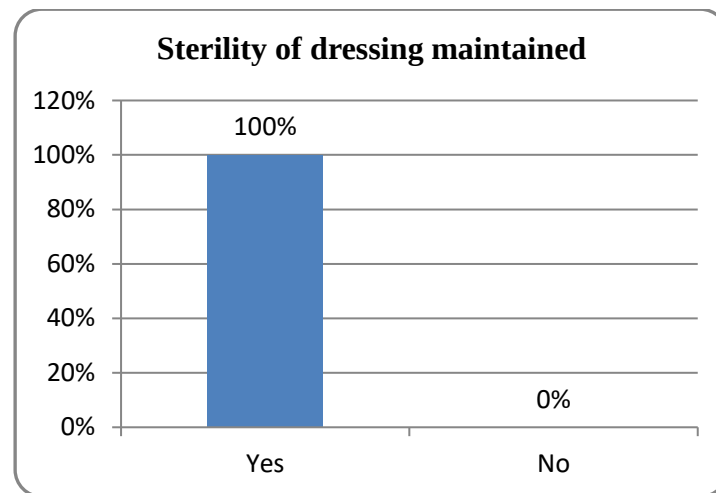
- Compliance to maintenance of intra-operative hypothermia was observed to be 93.3%.
- In 13.3%, blood glucose levels were not maintained below 180mg/dl. (as shown in graph under blood glucose levels)

3. To analyze the compliance to postoperative measures:

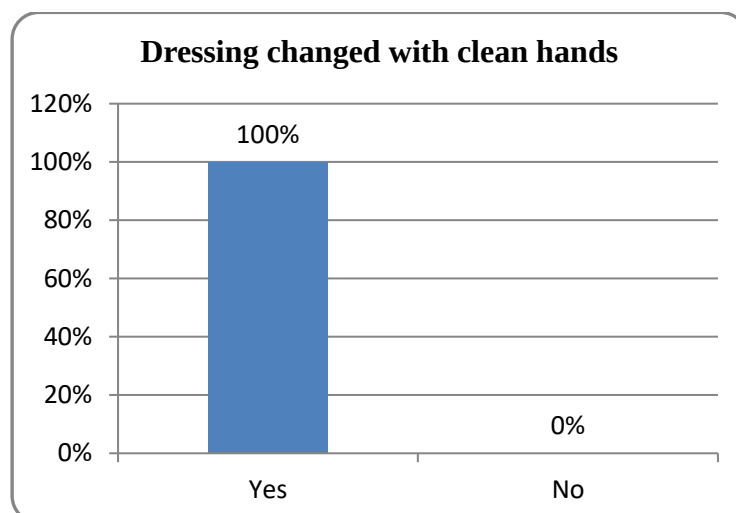
A) Sterility of dressing:

GUIDELINES:

- Sterile dressing must protect the incision for 24-48 hours.
- Hands must be washed before and after changing the dressing and any contact with surgical site.



B) Change of dressings:



INTERPRETATION:

- Sterility of dressing was maintained in 100% cases.

- Compliance to changing dressing with clean hands was also 100%

RESULTS:

- Compliance for technique of Preoperative hair removal- 100%, with 25% removal just before the surgery.
- 17.8% of the total sample was diabetic.
- HbA1c was done only for 62.5% of the diabetics. In all cases values of HbA1c were high, still they were operated upon.
- Intra-operative blood sugar levels were not maintained in 13.3%.
- Compliance observed for Preoperative Antiseptic Shower was 37.8%.
- Part Preparation (a) before reaching the OT was 66.7%, (b) just before the surgery was 100%. In all cases HICC approved antiseptic was used that is betadine.
- Compliance to hand/forearm antisepsis which included hand washing regimen was 100%.
- In 9% cases, the surgical team had transmissible diseases (cough & cold) and they had taken the recommended precautions.
- 100% compliance was observed for administration of prophylactic antibiotic to the patients before surgeries.
- Antibiotic prophylaxis in 54.8% of the total sample complied with the AMS protocol.
- Re-dosing of antibiotic was not done in 25% (applicable for surgeries of more than 2 hours duration).
- Only 77.8% complied with the standard temperature of OT (that is 17-23°)
- Compliance to humidity levels between 40-60% was observed to be 46.7%.
- For closure of door, compliance was only 6.7%. (Highest number of times the door was opened was 116)
- Compliance to sterilisation was 100% and flash sterilisation was 97.2%. In 2.8% flash sterilisation was used).
- Surgical attire and drape: Mask-Compliance was 53.3%.
OT foot wears- Compliance was 84.4%.
Gloves- Compliance was 100%.
- Compliance to following principles of asepsis was 64.4%
- Compliance to placement of drain through a separate incision- 100%.
- Compliance to maintenance of intra-operative temperature (normothermia) was 93.3%.
- Postoperative measures were fully complied with.

The average compliance of all the parameters for prevention of SSI at Fortis Memorial Research Institute, Gurgaon is 77.98%.

S.No.	Variables	Compliance
A	Preoperative Measures	
1	Preoperative hair removal	
	a) Technique	100%
	b) Timings- just before the surgery	25%
2	Blood sugar levels-diabetic	82.2%
3	HbA1c checked	62.5%
4	Intra-operative blood sugar levels	86.7%
5	Preoperative Antiseptic Shower	37.8%
6	Part Preparation	
	a) Before reaching the OT	66.7%
	b) Just before the surgery	100%
	c) Solution used	100%
7	Hand/forearm antisepsis	100%
8	Management of infectious diseases	91%
9	Administration of prophylactic antibiotic	100%
10	Compliance to the AMS protocol	54.8%
11	Re-dosing of antibiotic	75%
B	Intra-operative Measure	
1	Environment of OT	
	a) Temperature	77.8%
	b) Humidity levels	46.7%
	c) Closure of door	6.7%
2	Sterilisation assurance	100%
3	Flash sterilisation	97.2%
4	Surgical attire and drape	
	a) Mask	53.3%
	b) OT foot wears	84.4%
	c) Surgical gloves	100%
5	Principles of asepsis	64.4%
6	Placement of drain	100%
7	Maintenance of intra-operative temperature	93.3%
C	Postoperative measures	
1	Sterility of dressing	100%
2	Change of dressing	100%

The average compliance of all the parameters for prevention of SSI at Fortis Memorial Research Institute, Gurgaon is 77.98%.

RECOMMENDATIONS:

1. The operation theatres (zone 3) should have wooden doors and sensors must be installed in them so that they get closed automatically after any member of the surgical team enters or exits the OT.
2. Seminar must be conducted on Antimicrobial Stewardship and then post-test studies should be conducted so as to monitor its sustenance by the Quality department.
3. HbA1c levels must be tested for all the patients undergoing surgeries and required precautions must be taken if these levels are beyond permissible limits.
4. Pre-operative showering of the patients must be included in the pre-operative checklist and making sure that it is being followed.
5. An automatic system should be installed for the maintenance of optimal temperature and humidity in OT as per the hospital policy and a regular check must be done by a member of the OT committee.
6. Offer patients and carers clear, consistent information and advice throughout all stages of their care. This should include the risks of surgical site infections, what is being done to reduce them and how they are managed. Also educate them about how to care their wound after discharge. Also inform them how to recognise a surgical site infection and whom to contact if they are concerned.
7. A checklist should be made including all the parameters leading to increased SSIs with the help of the anaesthetist, surgeons, and nurses and assurance of incorporation of this checklist in the patient's medical record before surgery and making sure that it is being followed.
8. Following the recommended care bundles (the given guidelines and hospital protocols) for all the patients undergoing surgeries to prevent surgical site infections.
9. A survey should be done, interviewing all the members of the surgical team to know the reasons behind the noncompliance. A committee should be formed, which includes anaesthetists, surgeons, nurses, who can discuss these problems and come up with the required solutions. These solutions should be then implemented in the hospital to reduce the incidence of SSIs.
10. A training programme should be carried out to train the health workers about the hospital wide policy. This will take care not only of the knowledge and understanding about the hospital wide policy but also of the incidence of SSIs.

11. There is a need for further research and continuous updating of guidelines; comprehensive surveillance, using validated definitions that facilitate benchmarking of anonymised surgeon-specific SSI rates.
12. An infection control surveillance programme should be developed and implemented to track all the new cases of SSIs and the possible reasons behind them. These reasons could be used in the next training sessions.

CONCLUSION:

Surgical site infections can be easily prevented if the surgical team complies with the guidelines laid out by Centre of Disease Control and Prevention ensuring a remarkable reduction in morbidity caused by them.

But a serious non compliance has been observed in almost all the parameters. Only a few parameters were being followed judiciously by the surgical team. The average compliance to the hospital wide policy to prevent surgical site infection for FMRI, Gurgaon was 77.98%. There is a huge gap between the policy and what is been followed.

To prevent the incidence of SSI, above recommendation should be followed so as to increase the compliance rate. Following the protocols would help in preventing the SSIs, which are putting a major strain on hospital services. It would be a major step forward by the hospital towards achieving patient welfare and reducing unnecessary costs to ailing patients.

REFERENCES:

- 1) Surgical Site Infection (SSI) Event-
<http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSIcurrent.pdf>
- 2) Perspectives in Prevention and Treatment of Surgical Site Infection – A Narrative Review of the Literature -<http://www.woundsresearch.com/article/perspectives-prevention-and-treatment-surgical-site-infection-E28093-narrative-review-literature#sthash.jxjQ0qvvdpuF>
- 3) Nonconcordance with Surgical Site Infection Prevention Guidelines and Rates of Surgical Site Infections for General Surgical, Neurological, and Orthopedic Procedures-<http://aac.asm.org/content/55/10/4659.full#T1>
- 4) Adherence to Surgical Site Infection Guidelines in Cardiac Surgery in a Tertiary Hospital in Dubai, United Arab Emirates-<http://www.bioline.org.br/pdf?pr12078>
- 5) Adherence of Surgeons to Antimicrobial Prophylaxis Guidelines in a Tertiary General Hospital in a Rapidly Developing Country<http://www.hindawi.com/journals/aps/2013/842593/>
- 6) Surgical site infection: prevention and treatment of surgical site infection.
<http://www.guideline.gov/content.aspx?id=13416>
- 7) <http://www.ncbi.nlm.nih.gov/books/NBK53731/>

ANNEXURE 1:

Definition of SSI

Table 1. Summary of CDC definition of SSI.

Superficial Incisional SSI

- Infection occurs within 30 days after the operation;
- infection involves only the skin or subcutaneous tissue; and
- at least 1 of the following:
 - o purulent drainage (culture documentation not required);
 - o organisms isolated from fluid/tissue of superficial incision;
 - o at least 1 sign of inflammation (eg, pain or tenderness, induration, erythema, local warmth of the wound);
 - o wound is deliberately opened by the surgeon; or
 - o surgeon or attending physician declares the wound infected.

A wound is not considered a superficial site infection if there is:

- o a stitch abscess present;
- o infection of episiotomy or circumcision site;
- o infection of a burn wound; or
- o incisional SSI that extends into the fascia or muscle.

Deep Incisional SSI

- Infection occurs within 30 days of operation or within 1 year if an implant is present;
- infection involves deep soft tissues (eg, fascia and/or muscle) of the incision; and
- at least 1 of the following:
 - o purulent drainage from the deep incision but without organ/space involvement;
 - o fascial dehiscence or fascia is deliberately separated by the surgeon due to signs of inflammation;
 - o deep abscess is identified by direct examination, during reoperation, by histopathology, or by radiologic examination; or
 - o surgeon or attending declares deep incisional infection is present.

Organ/Space SSI

- Infection occurs within 30 days of operation or within 1 year if an implant is present;
- infection involves anatomic structures not opened or manipulated by the operation; and
- at least 1 of the following:
 - o purulent drainage from a drain placed by a stab wound into the organ/space;
 - o organisms isolated from organ/space by aseptic culturing technique;
 - o identification of abscess in the organ/space by direct examination, during reoperation, or by histopathological or radiological examination; or
 - o diagnosis of organ/space SSI by surgeon or attending physician.

Adapted from¹⁶ Horan TC, Gaynes RP, Martone WJ, Jarvis WR, Emori TG. CDC definitions of nosocomial surgical site infections, 1992: a modification of CDC definitions of surgical wound infections. *Infect Control Hosp Epidemiol.* 1992;13(10):606-608.

ANNEXURE 2:

Checklist used for the study:

Sr. No	Parameters	Whom to ask	Patient
PATIENT INFORMATION			
1	UHID/IPID No	File	
2	Age of the patient	File	
3	Date of surgery	File	
4	Type of surgery	File	
5	Date of discharge	File	
PREOPERATIVE MEASURES			
1	Preparation of the patient		
1.1	Any infection remote to surgical site	File/nurse	Y / N / NA
	a) Site of infection	File/nurse	
	b) Culture sent	File/nurse	
	c) Progress notes for antibiotics	File/nurse	
1.2	Was the hair removed before the surgery	File/nurse	Y / N / NA
1.3	When was the hair removed	File/nurse	
	a) A night before		
	b) In the morning		
	c) Just before the surgery		
1.4	Were surgical clippers used?	Witness/nurse	Y / N / NA
1.5	What was the serum blood glucose level	File/nurse	
	a) Was HbA1C done?	File/nurse	Y / N / NA
1.6	Is the patient tobacco user/ does he smokes?	File/nurse	Y / N
1.7	Did the patient bathe with an antiseptic	Patient/nurse	Y / N
	a) At night		
	b) In the morning		
	c) Others		
1.8	Was the incision site washed and cleaned	Witness	Y / N / NA
1.9	Which antiseptic was used to clean the area?	Ward nurse /witness	
	a) Was the antiseptic used according to HICC aproved list	Ward nurse	Y / N / NA

1.1	Was skin preparation done in concentric circles	Witness/nurse	Y / N / NA
2 Hand/forearm antisepsis			
2.1	Was the hand washing regime followed	Witness	Y / N / NA
2.2	Were there any hand/arm jewellery during surgical scrub	Witness	Y / N / NA
3 Management of infected personnel			
3.1	Did the surgeon have any transmissible infection	Witness	Y / N / NA
	a) Cough/cold	Witness	
	b) Open wound	Witness	
	c) Others	Witness	
4 Antibiotic Prophylaxis			
4.1	Antibiotic administered before the surgery (within 15-60 minutes of the incision)	File/witness	Y / N / NA
4.2	Was the antibiotic according to AMS-SP protocol	AMS-SP Protocol	Y / N / NA
	a) Name of the antibiotic	File/witness	
	b) Time of administration	File/witness	
4.3	Re-dosing of the antibiotic (if applicable)	File/witness	Y / N / NA
	a) Time of administration	File/witness	
INTRAOPERATIVE MEASURES			
5 Ventilation of OT			
5.1	What was the pressure of the OT	Witness	
5.2	What was the humidity maintained	Witness	
5.3	What was the temperature maintained	Witness	
5.4	Were the doors kept closed	Witness	Y / N / NA
	a) No of times the door was opened	Witness	
6 Sterilization			
6.1	Sterilization assurance	Sticker(witness)	Y / N / NA
6.2	Flash sterilization	OT Nurse /Witness	Y / N / NA

7	Surgical attire and drapes		
7.1	Surgical mask	Witness	Y / N / NA
	a) worn over nose		
	b) worn over mouth		
7.2	Head cap	Witness	Y / N / NA
7.3	Shoe covers/clogs/OT foot wears	Witness	Y / N / NA
7.4	Sterile gloves	Witness	Y / N / NA
8	Asepsis and surgical techniques		
8.1	Were the Principles of asepsis followed	Witness	Y / N / NA
	a) back to back movement	Witness	
8.2	Was the drain placed through separate incision	Witness	Y / N / NA
9	Patients' parameters		
9.1	Was the blood sugar maintained below 180mg/dl throughout the surgery	Witness/file	Y / N
	a) if not maintained, how many times did it go over 180mg/dl	Witness/file	
	b) what was the values of blood sugar	Witness/file	
9.2	What was the body temperature maintained during surgery (>2 hours)	Witness/file	
POSTOPERATIVE MEASURES			
10	Postoperative measures		
10.1	Was the sterility of the dressing maintained	Witness	Y / N
10.2	Was the dressing changed with clean hands	Witness	Y / N