



OPERATION THEATRE UTILIZATION



SUMMER PLACEMENT IN FORTIS HOSPITAL

PROJECT TITLE

**IMPROVEMENT IN UTILIZATION OF OPERATION
THEATRE IN A 550 BEDDED HOSPITAL**

Submitted To:

Dr. RAJIV KUNDRA

**Deputy Medical Superintendent,
Fortis Hospital, Mohali**

Submitted by:

Dr. ShaleenVasishta

MBAHM-2014-2016, IIHMR (JAIPUR)

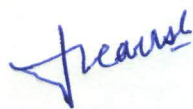
CERTIFICATE

This is to certify that SHALEEN VASISHTA undergone her Summer Training in from 1st April 2015 to 13th June 2015. The candidate herself carried out all the studies related to her Summer Training on " OPERATION THEATRE UTILIZATION"

Her approach to the study has been scientific and analytical.

The summer training is in partial fulfilment of the course requirement recommended for the award of Master in Business Administration-Hospital & Health Management.

I wish her success in all her future endeavours.



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



Prof. Monika Chaudhary
(Associate Professor)
IIHMR University, Jaipur

4-Jul-15

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms Shaleen Vasishta** has completed her Internship, in the Operation Theatre, at Fortis Hospital, Mohali, from **22-Mar-15 to 13-Jun-15**.

She did a project on "Improvement in Operation Theatre Utilization".
She possesses a keen observation and conducts herself with confidence.

We wish her success in her future endeavors and pursuit of her career goals.

For Fortis Hospital,



Kanwal Sandhu
Manager-Human Resources



A UNIT OF FORTIS HEALTHCARE LIMITED

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Letter of Authorization

I, Dr. Rajiv Kundra, Deputy Medical Superintendent, Fortis Hospital, Mohali give permission to Dr. Shaleen Vasishta, intern in the hospital from IIHMR to collect data in MS-OT. Her topic of study is Improvement in Utilization of Operation Theatre in MS-OT at FHM. She will be collecting data of patients in the MS-OT over a period of one month under various headings like patient wheeled in time, incision time, wheeled out time and then calculating opportunity lost for the specified period.

She has my permission to collect the data and analyze the results for the stipulated time.

Dr. Rajiv Kundra

(Deputy Medical Superintendent)

ABSTRACT

FORTIS HOSPITAL, MOHALI is a multispecialty hospital dedicated for Care of patients with tower specialties and related illnesses for more than a decade. The services have state of the art, technology and equipment, highest level of environmental controls and fully trained and experienced staff who are dedicated to the care of patients.

A study was carried out at a tertiary care hospital with objective of assessment of Operation Room Time Utilization analysis and identification of bottlenecks, if any for optimum utilization. It is essential to assess the existing workload as well as to optimize facility functioning and patient scheduling for surgical operations. The operation time utilization varies in different healthcare settings. Optimum utilization of the OT time has always been a priority area for hospital administrators. It also aids in allocating reserve time for emergency operations, asepsis measures and procedures, and provides decision making information for augmentation or downsizing of the facility. The study revealed that the utilization though satisfactory could be further maximized by increasing the operational timing of OT, reducing the Opportunity Cost in each OT and also minimizing the reasons for the delay. The study identified the main bottlenecks as the non adherence to OT timings which is leading to opportunity lost that is resulting in cases to go prolong from the scheduled timings.

ACKNOWLEDGEMENT

This project will be incomplete if I fail to show my earnest gratitude to certain people without whom this project would not have been a success. I sincerely appreciate the inspiration and guidance of all the people who played an indispensable role in completion of this project.

I, ShaleenVasishta, student of IIHMR, Jaipur, show my heartfelt gratitude to Fortis Hospital, Mohali to accept my request to complete my summer internship in their prestigious organization. I would like to thank HOD HR and Kanwal Sandhu, Manager HR Department for approving the permission for the internship.

My profound gratitude to my mentor here in Fortis, Dr. Rajiv Kundra for his exemplary guidance, monitoring and constant encouragement through the course of the research. His caring nature and motivation to follow the right way for conducting the audit always inspired me to do my work in an honest and best way. The lessons I learnt from him will always be with me and help me in my future life.

I also take the opportunity to thank Dr. Swami, Senior Anesthetist & Dr. Manish the coordinator Fortis Mohali for their cordial support, information and guidance, which helped me in completing this task through various stages.

I am obliged to the staff for cooperating with me throughout the project and taking out time from their busy schedule and giving their honest opinions.

Last but not the least; I would like to thank my parents and friends for their continuous support and encouragement throughout.

Dr. ShaleenVasishta

INTRODUCTION ABOUT THE ORGANIZATION

FORTIS HEALTHCARE LIMITED

A brief History and present

Fortis Healthcare Limited is one of the fastest growing and India's second largest healthcare provider in the country. The company was founded by the visionary business leader, Late Dr. Parvinder Singh, the Managing Director of Ranbaxy Laboratories.

Fortis Hospital- Mohali was the first step towards realizing his dream, his vision regarding the Indian Healthcare industry.

▪ **Mission Statement:**

“To create a world-class integrated healthcare delivery system in India, entailing the finest medical skills combined with compassionate patient care”



- Late Dr. Parvinder Singh
Founder, Chairman Fortis Ltd

▪ **Vision Statement :**

“Globally Respected Healthcare organization known for Clinical Excellence and Distinctive Patient Care.”

FORTIS HEALTHCARE LTD. Was incorporated in 1996 to develop a world-class system of integrated healthcare delivery in India, comprising super-speciality areas along with multi-speciality care at the tertiary level.

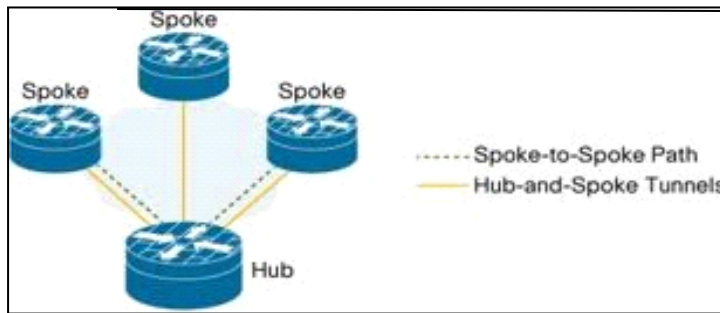
- Late Dr.Parvinder Singh's Dream was carried forward by his Sons, Malvinder.M.Singh and Shivender.M.Singh.
- Fortis is the manifestation of Dr.Parvinder Singh's ideology and has been rapidly growing through a combination of acquisitions, Greenfield, Brown field and management contracts.
- Fortis is in collaboration with the renowned hospital Escorts and has created history by acquiring 10 Hospitals from Wockhardt, giving it a strong Pan India presence; this was one of the largest deals ever in the Healthcare industry.
- In 2005, Fortis announced its first International foray jointly with Mauritius based partner, and thus came into existence "**Fortis Clinique Darne** "

JOURNEY OF FORTIS:



- 1996 : Foundation of the vision
- 2001 : JUNE, : Cardiac centre Launched
- 2002 : AUGUST : Multi speciality wing
- 2005 : Acquisition of 5 ESCORTS HOSPITALS
- 2009 : JANUARY, First International Hospital in partnership- MAURITIUS
- Latest acquisition ; 10 Wockhardt Hospitals Pan India

▪ **OPERATING MODEL :**



Fortis operates on a Hub and Spoke model to provide, Multi-speciality and Tertiary level medical care.

HUB's – are the super-speciality Hospitals

SPOKE's – are the Multi specialitycentres.

Patients who have the need are referred to these Hubs from the Multi speciality facilities in the Region, by embracing this system the patient benefits from the many available network facilities.

▪ **SOME HIGHLIGHTS :**

- Fortis Hospital Mohali is the most advanced Hospital in the Tricity (Chandigarh, Mohali, and Panchkula) and the nearby regions, and has State-of Art Infrastructure and Technology and services. There are now 64 Fortis Hospitals across the globe.
- Fortis Hospital Mohali is the first Hospital that was started and the biggest in the tricity, i.e. a 400 Bedded Hospital with 250 Operational Beds and 7 Operation Theatres, 4 ICU's and a Round the clock Emergency Dept. and 24hrs Pharmacy along with Ambulance services.
- Recent Development is the FORTIS CANCER INSTITUTE at Mohali.
- Fortis Hospital Mohali has been awarded “BEST DESIGN AWARD” By American Institute of Architecture 1999.

- Built-up Area of Fortis Hospital Mohali 400,000 sq.ft, with a investment of 155 Crores.

QUALITY FOCUS & ACCREDITATION:



Organization Accredited
by Joint Commission International



Fortis Healthcare has been at the Forefront of providing quality healthcare services and has raised the bar of Quality Standards in the country. The hospital employs renowned medical talent from the healthcare industry.

- Due to their excellent Quality care standards & safety for patients 3 of Fortis's Hospitals have received the Prestigious JCI Accreditation 9 Joint Commission International)
- JCI- is the largest accreditor of Healthcare organisation in U.S
- In Addition to this, 6 Fortis hospitals in India have been given the highly Respected NABH Accreditation, which is the highest national recognition for Quality, Patient care and Safety.
- On the other hand even the Labs have been given NABL accreditation.

JCI- Joint Commission International



- JCI accreditation is the Gold Standard for all the US and European hospitals, depicting the highest levels of Patient care and Safety
- The Mission of the Joint commission international is to improve the quality of Healthcare.
- It is awarded to those hospitals which reflect the highest levels of Patient care and Safety.
- The accreditation standards are listed in the third edition of JCI, functionally divided to 7 Patient centered chapters & 6 Organisation management chapters.

PATIENT CENTERED STANDARDS	ORGANISATIONAL MANAGEMENT STANDARDS
1. Access to Care and Continuity of care	1. Quality improvement and patient safety
2. Patient and family Rights	2. Prevention and control of infections
3. Assessment of Patients	3. Governance, leadership and direction
4. Care of Patients	4. Facility management and safety staff
5. Anesthesia and surgical care	5. Staff qualifications and education

6. Medication Management and use	6. Management of communication and information
7. Patient and family education	

NABH- National Accreditation Board for Hospitals & Healthcare providers



- NABH is a constituent board of Quality council of India, structured to cater to much desired needs of the consumers and to set Benchmarks for Progress of health industry.
- The standards provide framework for quality assurance and performance improvement of hospitals.
- The Standard focus is on Patient safety and quality of care.
- There 10 Chapters in the NABH book, which comprise of two Major aspects of Healthcare delivery.

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Patient Centered	Organisation centered
1. Access, Assessment and Continuity of care.	6. Continuous Quality Improvement
2. Care of Patients	7. Responsibility of Management
3. Management of Medication	8. Facility Management and Safety
4. Patient Rights and Education	9. Human Resource management
5. Hospital infection control	10. Information Management system

Certificate of Accreditations, Fortis Mohali:

- Awarded JCI Accreditation on 15TH June, 2007
- Re-Accreditation July, 2008, 2013

- Awarded NABH Accreditation on 16th June,2008
- Re-Accreditation June, 2011
- NABH audit 9th-11th May,20

HOSPITAL OVERVIEW



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- **FHM** – is divided into 2 Blocks, A - block & B – block, and now recent development is the Fortis Cancer Institute, which maybe named C – block.
- Further, again the Departments are divided Floor wise, which is as follows,
- **Basement:** Materials, Stores, H.R, House-keeping, MRD, Biomedical engineering dept, CSSD, Laundry, Food & Beverage dept.
- **Ground Floor :** Reception, Registration, OPD's Blood Bank, X-ray, NICU, General ICU, Patient waiting areas, IDBI Bank+ATM ,cafeteria, CCD, Prayer Room, Children play area, Dietetics,PWD-Patient welfare dept.Emergency. Lab, Nuclear Medicine, Clinic Rejuve, Pharmacy
- **1st Floor :** OPDs, Wards, CMO office, MICU
- **2nd Floor :** MSOT,CCU, Cath Lab, PCR, ORTHO OT
- **3rd Floor:** Executive offices, Café Jamjaajee, Paalna Library. Auditorium, Finance, Marketing, Media & Communication, IT, CSR, FOS, QA Dept.
- In all there are 27 Depts. in the Hospital.
- Some Depts. At FHM are Outsourced, like :
 - IVF- Dr. Pai& his Team (Mumbai)
 - Lab : SRL

- Ultrasound,CT,MRI : Dr.Chawla
- Dental : Axiss Dental

And latest addition is Physiotherapy Dept. outsourced to Dr.Balaji

Overview of FHM Department wise

➤ **OPD – Out Patient Department**

The OPD at FHM is a Multi –specialitycentre bringing to the patients all the required specialties under one roof. It consists of the following specialties like Cardiology, Dentistry, ENT, Gastroenterology, Endocrinology, internal Medicine, child specialist, Gynecology,

Neurology, Ophthalmology, Orthopaedics, Psychiatry, Pulmonology, Rheumatology, Urology, Radiology Lab, Nuclear medicine, Pathology.

It also has Home Based Rehabilitation Programmes and also has a Rehabilitation centre-cum inn providing a world class ambience along with Patient care.

➤ **Preventive Health Care : *CLINIC REJUVE***

Fortis firmly believes in Prevention is better than cure, and this is done here at Clinic Rejuve, where preventive Healthcare packages are given to pts and their family members at discounted rates to help them identify High-Risk pts and guide them towards better and healthy living, and providing them with required Medical help or Medication, and try to decrease lifestyle diseases by guiding towards healthy living.

- **Radiology:** Fortis can boast about having one of the most Advanced Radiology dept with skilled technicians and with the latest and most advanced machines. The Dept. has facilities like 64 Slice CT Scan, MRI, Mammography, X-Ray Ultrasound.

- **Nuclear Medicine:** This Dept. uses Safe, Painless, cost-effective method to image body with specialized diagnostic Gamma Cameras, in order to identify organ function and find out if presence of any disease.
- **Pathology:** SRL Ranbaxy manages the Path Lab at FHM. One of Asia's leading clinical testing facilities, SRL follows the protocol of College of American Pathologists Staffed with highly skilled technicians and equipped with digital analyzers and complete automation in Biochemistry, Hematology Serology, Microbiology and Pathology and these services are rendered round the clock 24x7, and has also been Awarded NABL.
- **Physiotherapy:** FHM has a dedicated Physiotherapy dept. which facilitates quick rehabilitation and pain management plus manage pts with musculoskeletal, cardiothoracic and neurological conditions. They also aid in Geriatric care from Degenerative diseases and provide Rehabilitation post trauma /surgery.
- **Dietetics:** The goal of the Diet clinic is to provide diet consultation to patients and their attendants and satisfies their diet related queries. This dept organizes specific individual counseling and diet education to the pts based on the clinical parameters and Doctors prescription.
- **IPD:** FHM has a total capacity of 350 beds out of which 315 are functional. The functions of IPD are to Admit/Discharge/Transfer pts. Collect patient information and coordinate the admission with the other functions of the hospital. Arrange for the billing accept reservations, Disseminate information. It has a Reception desk all the above procedures are done.

- **OT'S**— there are 3 Main OT's Cardiac-OT, MS-OT, Ortho-OT

Cardiac OT : Bringing breakthrough technologies to the operating room, and setting international standards in its cardiac facilities, FHM has one of the most state of art OT with the most advanced lung and heart machines and many such devices. Cardiac OT has been constructed around a central sterile core which has the provision of storing all the sterile items to be used in the OT. It also has a Stas lab for immediate ABG & Electrolyte and steam sterilizer. The OT is directly connected with CSSD thorough a Dumb waiter lifter to transfer items.

Cardiac CATH Lab: FHM has 3 Cath labs that function Round the clock 24hrs and 7 days supported by a sophisticated CCU. It has some world class equipments like, COROSCOPE - by Siemens used for electrophysiological monitoring and INNOVA 2000 –by GE a digital imaging system, one of its kinds in the world.

MSOT: Multispecialty Operation theatre

FHM is equipped with high-tech OT's where high risk surgical procedures are performed by a dedicated team of experts. There are 6 Major and one Minor OT. A State-of-Art Neuro OT has been commissioned and is only of its kind in the region.

On an average 15-20 cases are done in MSOT from 8am to 8pm, however Emergency services are available round the clock.

Ortho OT

There are 3 OT for Joint Replacements where knee replacement, hip replacement and trauma cases are taken up. On an average 10-12 cases are taken up here from 8am-8pm.

➤ CCU : CRITICAL CARE UNIT :

CCU is managed by experts in critical care, with patient to nurse ratio 1:1. Trained intensivists are adept in all emergency techniques such as airway management, IV, Anesthesia etc.

➤ EMERGENCY DEPARTMENT:

The Dept. of Emergency Medicine at FHM is adept with the most modern life support systems and manned by highly qualified paramedics with knowledge and skills to evaluate and stabilize pts who seek emergency medical care, especially those with potentially lethal and serious conditions.

The Dept is equipped to handle all emergency cases like,

- Cardiac emergencies : Chest pain, heart attacks, angina
- Neuro. Emergency: Stroke, shock
- Medical emergencies : Poisoning, abdominal pain, lung problem ,liver, kidney

- Surgical emergencies : appendicitis, lacerations, cuts , wounds, fractures, trauma, RTA's

➤ **WARDS :**

The Wards at FHM are, A1, A2, A3, A4 Latest additions A6 (Cancer institute block)

A1 A2 is located on the first floor.

A1 Multi-speciality unit which have a capacity of 33 which includes 2 deluxe rooms, and one presidential suite

A2 Cardiac unit, bed capacity of 38 with one presidential room, 5 Double rooms and 10 single rooms.

A3 is Multispecialty again, with 47 beds

A4 A5A6 has also been made now.

➤ **FORTIS PAALNA:**

FHM has launched a complete Obstetrics and Maternity division .It aims at offering young expectant mothers an excellent experience of childbirth and care. FHM aims to make the delivery safe and comfortable.

➤ **PHARMACY :**

Pharmacy is one of the most important units in the hospital. FHM has In Patient Pharmacy on 2nd floor, and the Out Patient Pharmacy on the Ground floor. The Chemist shop is right at the entrance that operates 24x7 and the aim of this Dept is to provide standard medicines to pts .The entire medicine and medical disposable requirements of OPD pts and discharged IPD Patients are met by the Pharmacy Dept.

➤ **CSSD : CENTRAL STERILE SUPPLY DEPARTMENT**

Ensuring high standard of sterilization and disinfection to minimize the incidence of hospital acquired infection rate, is one of the most essential feature at FHM.

The objective of the Central Sterile supply Dept. is to provide all the hospital departments served adequate supply of sterilized goods conforming to highest standards of sterilization from a central place thus reducing the overall cost and contributing towards

reduction in the incidence of hospital acquired infection. Destruction of all micro-organisms including their spores is done by chemical or physical means.

Sterilization methods used:

- 1) Steam Sterilization
- 2) Ethylene Oxide Gas Sterilization

To minimize the time as well as distance, CSSD is connected with Cardiac units and OTs through two dumb waiter lifts. One is used to transfer the sterile goods, and one for transportation of contaminated goods.

The Dept is divided into 3 zones,

1. Decontamination Area
2. Semi-sterile Area
3. Sterile Area

There are timings for supplying and taking of the goods at CSSD, for Wards and others

Morning- 8.15am to 11am

Evening- 2-30pm to 5pm

While for Emergency /OT's there is no time restriction (Inventory stock is kept in the Ratio 3:1 to avoid any kind of shortage)

➤ **PWD - PATIENT WELFARE DEPARTMENT:**

Since its inception Fortis Healthcare has been aspiring to track patient satisfaction and feedback through our Patient Welfare Program. Fortis healthcare has an established PWD and the welfare officers, termed as the pink ladies – due to their uniforms act as liaisons between the patients/customers and the hospital. They are patient's advocates or representatives striving to provide solutions to any problem they may encounter here at Fortis.

➤ **HUMAN RESOURCE DEPARTMENT**

Some of the important functions of HR are:

Manpower planning, Recruitment and Selection, Training and Career Development, Periodic Employee Performance Appraisal, Employee Rights/Welfare/Grievance, Wage and salary administration, rewards, incentives, Trainings, Job description and Job Analysis, employee engagements programmes- Fortis idol, FHM Nachbaliye, Doctor/Nurse/Staff of the month etc. Thus this Dept is one of the key depts. for functioning of the hospital.

➤ **IT- INFORMATION TECHNOLOGY:**

The mission of the dept. to implement and support the IT related infrastructure required to achieve the target of being a near paperless and film less institute. The major tasks include Systems support, looking after the installation and routine maintenance of the Computer systems and networking at FHM Mohali.

There are IT Help desk, nos.6050, 6055, there are 13 servers 450 work stations, call centre, etc. Backups and internet are also maintained by this dept.

The Soft wares used here at FHM are, MEDTRAK and PYROGEN.

PYROGEN: operational only in the accounts and Pharmacy Dept.

MEDTRAK: is operational in all the depts. at FHM

Fortis was one of the first few hospitals to HIS Hospital information system.

➤ **FINANCE :**

One of the Most integral dept. of the hospital, which is responsible for Revenue collection, calculation and all money related matters, Purchases, allowances or salary of Employees, Situated on the 3rd floor of Block B.

➤ **MARKETING :**

FHM is the first of its kind of Hospital in this region, and FHL has been formed with the sole objective of providing total integrated healthcare by establishing State-of-Art Health delivery system. This dept along with Media and communication creates awareness through Ad, Banners, Hoardings Press releases and interviews on Radio and Seminars.

➤ **CSR : CORPORATE SOCIAL RESPONSIBILITY**

For the upliftment and betterment of Society, this has now become a Mandatory issue, 2% of the profits are supposed to be used for CSR activities for the welfare of the people. FHM also is doing its bit, and has 21 programmes running like,

CHETNA: To provide help to the underprivileged girl child

ACTFAST: To spread awareness about HIV/AIDS

SAARTHAK: To extend support to cancer patients

SAHAYAK: A programme for Dialysis Patients

NANHI CHAH: To celebrate birth of a girl child and plant tree saplings

Friends of Fortis, Rural Outreach camp, Blood Donation Camps, Free Health checkups to name a few.

➤ **F&B –FOOD AND BEVERAGE DEPARTMENT :**

This is again a vital part of the Hospital as it provides the restricted and special diet to the patients as per requirements. It is responsible for pre-preparation, Preparation, service, clearance of Food and Beverages.

➤ **MATERIALS/ STORES/PURCHASE :**

This dept is responsible for purchase storage of Medical Consumables, Stationary, Medical equipments, Pharmacy stores, its aim is to provide right item at the right time at the right price and quantity. Here at Fortis we have a CBU-Central Buying Unit that procures all the orders. Functions of this dept. are Procurement, Storage, and Distribution.

➤ **HOUSE-KEEPING :**

Another important dept. takes care of the facilities present in the Hospital. A team of 11 Supervisors help in maintaining the cleanliness of the Hospital right from the premises, public areas and Patient areas.

➤ **ENGINEERING :**

FHM functions the way it does i.e. flawlessly, thanks to this dept. The major work of this department is Building maintenance, Water supply, Power backup, Gas supply, Sewage treatment plant.

➤ **BIOMEDICAL :**

This dept. is again a very important part of the hospital as it helps FHM to maintain its world class services by using world class equipments flawlessly. It looks after all the medical devices and equipments.

➤ **MRD – MEDICAL RECORDS DEPARTMENT:**

Situated at the basement, the MRD keeps a record of all the patient files along with their details and history.

➤ **LIBRARY :**

A library is present on the Third Floor that houses various reference books, Journals, articles etc and every employee is a member.

➤ **CAFÉ JAMJAJEE :**

Situated on the 3rd Floor, the canteen of the Hospital, the unique name lies in the history and Values of Fortis and Fortis culture. A well arranged cafeteria where the staff have their meals daily.

➤ **SECURITY :**

The security although is outsourced gives a 24X& cover to the entire Hospital and especially regulates the traffic in the parking areas.

➤ Some of the other facilities available are :

- Fortis inn : a paid rest house for the attendants of Out-station patients, or the Attendants of Patients for some rest within the hospital
- Café 24: an in house Restaurant that offers a wide variety of food for the attendants and family members of the patients.

- Bank/ATM : IDBI Bank and ATM is also present within the premises that can be very helpful to the customers in cases of need for money, and don't have to run around to get instant financial aid
- Café Coffee Day: CCD as is it well known is also present in the premises near the waiting area, again which is there to cater the needs of the people.
- Prayer Room : keeping in mind the religious and spiritual needs of the people, such a room is created where people can pray for their loved ones
- Play area: Especially for Children, this area has been designed.
- Many other miscellaneous things like Nescafe Shop, Gift shop, etc is also present in the Hospital premises.

OPERATING ROOMS LITERATURE

The major decision centers round the number and type of operating rooms. While planning and equipping each operating room, a series of questions need to be answered. The relate to size, usage, lightening (surgical and gen. illumination), intercommunication and signal systems, electronic equipment and monitoring system, medical gas system(suction, oxygen, nitrous oxide and compressed air) and other service lines, fixtures, safety precautions such as grounding for X-ray, TV camera, and against static electricity, storage, supply cabinets, environmental control, etc.

Operating room should have walls and floor of impervious semi-matt surface with anti- static flooring. Tiles are not recommended due to crevices formed between them. Static electricity, which is produced due to friction of floor with shoes or wheels or moving equipment, is major problem. A mosaic floor with the least possible joints and with brass or copper stripes six inches apart both ways carries away static electricity.

In general hospitals, the tendency is to have all major operating rooms as nearly identical as possible(except in specialty hospitals where provision is made in some of them for special procedures) so the scheduling of various kinds of surgery is possible.

Operating rooms must have minimum clear area of 33.44 sq.metres (360sq.ft) = 5.48*6.10 meters (18*20 ft) excluding fixed cabinets and built in shelves. Many surgeons, however, recommend larger space- 6010 by 7.31 meters (20*24 ft) =44.60 sq. meters (480 sq. ft) for major operating rooms and 7.31*7.62 meters (24*25 ft)= 55.70 sq.meters (600 sq. ft) for

special procedure rooms. Each operating room should have X- ray film illuminator which should hold at least two films at a time, and an emergency communicating system that can be activated without the use of hands for contact with the surgical suit control station or frozen section laboratory.

An orthopedic surgery room should have, in addition, an enclosed storage space for splints and tractions. If this storage is outside the operating room, it should be easily accessible. If plaster of Paris is used for cast work, a plaster sink should be provided.

Glass panels permit vision into the operating rooms. David porter, a renowned and experienced hospital architect of America, recommended that major operating rooms be size 20ft * 24 ft= 480 sq. ft(approx. 6.10 * 7.13 meters = 44.60 sq. meters) and special procedure rooms 24 ft* 30ft =720 sq.ft (approx. 7.31 * 9.14 meters = 66.88 sq. meters). In the author's opinion 600 square feet should be adequate.

A more scientific way of estimating/ calculating the required number of operating rooms is by dividing the estimated number of procedures per year by the number of procedures that can be performed in one operating room in a year.

It has been that an average primary and secondary hospitals(of approx. 400 beds), with a balanced mix specialties', can perform 1000 to 1300 procedures per operating room in a year(total of major, minor and cystology procedures.). a major tertiary hospital, however, averages fewer (750- 1000) procedures per room because the procedures themselves are more complicated. In anew and upcoming hospital, forecasting the number of surgeries is easier said than done. However, in a running hospital that is to be upgraded, it can be calculated on basis of previous year's performance.

INTRODUCTION OF MULTI-SPECIALITY OPERATION THEATRE

**IMPROVEMENT IN UTILIZATION OF THE AVAILABLE OT RESOURCES TO
ENSURE BETTER EFFICACY IN TERMS OF MANPOWER & EQUIPMENT IN
350 BEDDED HOSPITAL**

SOURCES:

Senior Anesthetist- Dr. Adarsh Chandra Swami

OT-co-ordinator- Dr.Manish Sharma

Depty Medical Superintendent- Dr. Rajiv Kundra

Nursing Supervisor- Sis. Rajbir

Nurse Manager- Mr. William

Technician- T.N Pandey

Data Operator- Sidharth&Sharda

INTRODUCTION:

There are 9 MS- OT in this hospital where all surgeries take place.

The MS- OT department has the following areas:

- 1) Pre-Operative area (6 bedded)
- 2) Post- operative area (10 bedded)
- 3) Pharmacy sub store
- 4) Data operator room

- 5) Instrument Store room
- 6) Instrument washing room
- 7) Instrument /linen room(sterile)
- 8) Doctor's changing room
- 9) Nurse's changing room
- 10) Nursing Office
- 11) Technician Room

The MS- O.T's are named as:-

- General Surgery OT's- 5
- Neurosurgery OT
- Procedure Room
- Trauma OT
- Vascular Cath Lab

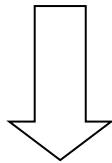
STAFF:

- ANESTHESIA TECHNICIANS: 24
 - ANESTHESIOLOGISTS: 32 on any given day(rotational duty)
 - TECHNICIANS: on any given day(rotational duty)
 - NURSING STAFF: 53
 - DATA OPERATOR: 2
-
- Apart from this housekeeping and GDA also work there.
- Nurses perform their duties in following manner:-
- 1 NURSE in Pre- op care
 - 1 NURSE in Post – op care

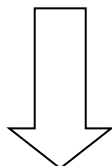
- 1 Floor nurse in O.T. who will give all sterile instruments to scrub nurse, will verify with the surgeon, anesthetist and the scrub nurse about the operation procedure and in the end after the surgery will take a count of all the instruments that are used and write it in patient file.
- Scrub nurse in O.T. will assist the surgeon during operation.
- Technicians assist anesthetist during operation and also keep buffer of drugs used for anesthesia. They got reserve of drugs for at least 5 patients.

PROCESS FLOW FOR OPERATION

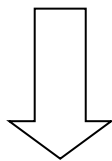
P.A.C.(PRE-ANESTHETIC CHECKUP)



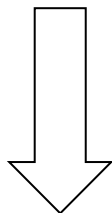
SLOT BOOKING



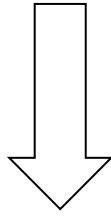
PRE – OPERATIVE AREA



OPERATION THEATRE



POST- OPERATIVE AREA



ICU, WARDS

SLOT BOOKING:

The slot booking is done by supervisor on request of consultant and ideally it is done if fees is deposited by the patient. During booking following things are noted

- Patient name , age,sex
- UHID
- Date of surgery
- Procedure
- Slot time
- Total hrs of surgery
- Consultant
- Any specific requiremnt for surgery
- Patient contact number.

One day prior to operation patient is called up to confirm operation timing so that patient should come & admitted on time and also if there is some confusion in patient mind then advice them to contact concerened person & try to sort it out.

Filling up all necessary forms in pre-op e.g. authorised consent, anaesthesia consent etc.

Arrange instruments, linen or any specific requirement before operation. Email is sent one day before to CSSD to ensure this.

Also arrange specific equipment in O.T.

PHARMACY STORE:

This is maintained by a pharmacist and contain drug stored related to nursing staff and technicians. For every case of operation 2 indent forms are made in which drugs used in operation are mentioned. One by nursing staff and other by technician which are given to pharmacist who forwarded those forms to main drug store to take those medicines.

EQUIPMENT ROOM:

This room contains all special scientific instruments used in surgeries. The main equipments are:

- Navigation system
- Saw system
- Instrumentation (hand instruments,

POST –OPERATIVE PROCESS :

Once operation is done patient is shifted to post-op room.

Forms like billing activity, operative notes , biopsy forms are filled up. The patient is kept in post-operative area for 2hrs. In this duration the vitals of the patient is monitored and recorded in the patient file.

CLEANING OF OPERATION THEATRE AND WASHING OF INSTRUMENTS:

Cleaning of O.T. is done by housekeeping staff.

Washing, packing of instruments is done by floor/scrub nurse in instrument washing room and then it is sent to CSSD through dumbwaiter lift.

CSSD after sterilization sent instruments, linen to sterile instrument/linen room through different dumbwaiter lift.

FORMS USED IN OPERATION THEATRE:

1. Authorised consent form used for patients both under GA and LA.
2. Anaesthesia consent form used only for GA not for LA.
3. OPD flow sheet for OPD patients.
4. Surgical safety checklist.
5. Pre-op checklist used only for IPD patients.
6. Consignment consumption sheet.
7. Billing activity form.
8. Operative notes.
9. Biopsy form.
10. Microbiology request sheet.
11. Nurses count sheet.

DATA RECORDS :

The main data recorded by data operators are

- Daily report and scorecard
- Cancellation and Delay data
- Unplanned surgeries data is maintained

SUPPORTING DEPARTMENTS :

- BIO MEDICAL
- CSSD
- ENGINEERING (infection control)
- MEDICAL PATHOLOGICAL LAB(infection control)

1) BIO MEDICAL ENGINEERING DEPARTMENT:

Source

- Mr. Rajeshwer Singh

This department mainly deals with maintenance of equipments used in hospital e.g. O.T.

Preventive calibration of all equipments is done twice per year apart from on call checking.

Defected parts are purchased under repair and maintenance budget. If equipment is to be replaced or purchased new then capital budgeting is done and referred to purchase department.

Staff- Total 6 engineers and work is 24 hrs in shifts.

2) CSSD (CENTRAL STERILE SUPPLY DEPARTMENT)

SOURCE:

Mr. Subhash Prasad- Supervisor

Mr. Paramjit Singh- Technician

Its main work is to receive unsterile linen and equipments from various departments e.g. wards, operation theatres, labs etc and then delivering them back to the respective departments. This department works for 24hrs.

STAFF:

Supervisor-1

Technician- 6

GDA -3

Tailor -1

They work in 3 shifts with 2 technicians and 1 GDA in each shift.

AREAS:

- 1) DECONTAMINATION AREA
- 2) ETO STERILIZATION AREA
- 3) STEAM STERILIZATION AREA
- 4) STERILE AREA

DECONTAMINATION area receives used instruments from wards and decontaminates them with help of RAPID ENZYME CLEANER machine which is a ultrasound vibrator cleaner.

ETO STERILIZATION area is a room where ethylene oxide gas is used for sterilization. It is used mainly for items like ampu bag, plastic items, lap chole instruments, eye surgery instruments, and neuro surgery instruments.

ETO machine has got 2 cycles

Hot cycle works at 55 degree C and takes 12 hrs to sterilize.

Cold cycle works at 37 degree C and takes 40 hrs to sterilize.

ETO machine takes only one load per day and it has got expiry date of 3 months of its sterilized items.

Biological indicator which is meant for confirmation of sterilization is must used along each load of ETO machine.

STEAM STERILIZATION area has 2 machines in which steam is meant for sterilization of all linen and other instruments which comes directly from O.T. after being washed and packed through DUMBWAITER LIFT. Linen is washed by laundry department and then received by CSSD for sterilization.

These machines take 8 loads per day and has got expiry of 7 days of its sterilized items.

Here biological indicator is randomly used not along with every load.

Chemical indicator is pasted on every pack which confirms sterilization.

BOWIE AND DICK TEST is very important as it confirms sterilization in deeper layers of packs mainly heavy sets. It looks penetration of steam into every layer and is done on weekly basis.

STERILE area receives all sterilized items and is distributed to respective departments through dumbwaiter lift.

Apart from all above procedures **culture swab** is taken for examination testing from sterile area, items after every 15 days to see whether everything is going fine or to take step if any culture become positive

3) INFECTION CONTROL OF O.T.

Sources:

- Dr Anita Sharma – HOD med. Path lab
- Neeraj Tandon – engineering deptt.

Infection control is mainly done by 2 departments:-

1. Engineering department.
2. Medicine path lab

Physical checks or parameters of O.T. which regulate infection control are 6 in number and controlled by engineering department. These parameters are

- I. Number of air changes
- II. Fresh air changes
- III. Temperature
- IV. Humidity
- V. Air flow (air pressure)
- VI. Integrity of HEPA filters.

These parameters are controlled by

- BMS i.e. building management system.
- In and out temperature at AHU (air handling unit).
- Controlling 20-24 air changes per hour.
- Humidity control by either lowering down the temperature of chilled water or by removing humidity from system.
- Air flow in O.T. is in laminar form i.e. away from patient's body.

SPECIALITIES:

- **Orthopedics**
- **General Surgery**
- **Vascular Surgery**
- **Neurosurgery**
- **Urology**
- **Plastic Surgery**
- **Gastroenterology**
- **Gynecology**
- **ENT**
- **Ophthalmology**
- **Dental**
- **Liver Transplant & Kidney Transplant**
- **Pediatric Surgery**

- **Thoracic Surgery**
- **Pain Procedures**

STATE OF THE ART EQUIPMENT:

- **Three completely modular OTs with state of art lights & accessories.**
- **Harmonic scalpel & vessel sealers.**
- **CUSA for liver & brain**
- **OPMI pentero operating microscope**
- **Top of the line anesthesia machines with BIS monitoring & non- invasive CO monitoring.**
- **Holmium Laser**
- **YAG Laser**
- **State of art C- ARMs**
- **Neurosurgery Endoscopic Instruments**

OBJECTIVE:-

**Delay caused from patient wheel in
time to incision time**

PROBLEMS:

Unwrapping/arranging of the instruments before operation starts is done by one nurse only.

- Doctors on call sometimes take some extra time in reaching the hospital for the surgery.
- Any technical fault

- Surgeon arrival time
- All Instruments not available at times which may lead to a delay.

OPERATION THEATRE COMPLEX

INTRODUCTION

The operation theatre complex of a hospital represents an area of considerable expenditure in a hospital budget and requires maximal utilization to ensure optimum cost-benefit. The surgical suite typically consumes 9-10% of the hospital budget.

Surgical suites once needed only 20% utilization to produce a positive bottom line. However, economics of the OR environment have changed dramatically in the past 25 years.

Technological advances like minimally invasive surgery which need costly equipment, payments based on diagnosis related groups, captivated payment and discounted fee-for-service have all significantly reduced margins in the surgical business.

The surgical suite of a modern general hospital and everything that goes with it makes a very complex workshop. Present day surgical procedures involving more people and highly sophisticated and larger equipment have rendered operating rooms of somewhat obsolete. Even more complicated is the question how to make the functioning of operating rooms over tense hours smooth and comfortable.

PHYSICAL INFRASTRUCTURE OF OPERATION THEATRE

While planning and equipping each operating room, a series of questions need to be answered. The relate to size, usage, lightening (surgical and gen. illumination), intercommunication and signal systems, electronic equipment and monitoring system, medical gas system(suction, oxygen, nitrous oxide and compressed air) and other service lines, fixtures, safety precautions such as grounding for X-ray, TV camera, and against static electricity, storage, supply cabinets, environmental control, etc.

FEATURES	SPECIFICS	REMARKS
LOCATION	Visibility	Good
ENTRANCE	Reception	Not available
	Waiting area	Available but inadequate
	Changing area	Available
PRE- ANESTHETIC EXAMINATION ROOM	Available	Available
DOORS LIGHTING	CLEAR WIDTH	Adequate
	SELF CLOSURE	Available wherever necessary
	Natural	Adequate
	Artificial	Adequate
	CLEAN	Good
	STERILE	Sterility maintained at sterile areas.

FEATURES	SPECIFICS	REMARKS
DOORS	CLEAR WIDTH	Adequate
	SELF CLOSURE	Available wherever necessary
LIGHTING	Natural	Adequate
	Artificial	Adequate
DIMENSION FOR POST OPERATIVE WARD	Inter bed distance	Adequate
	Foot end to foot end	Adequate
	Bed to wall	Adequate
	Head end width	Adequate
	Area	Adequate
SIGNAGE	Fire dept. norm exit signs	Available
	Fire dept. norm exit maps with current location	Available
	Cloth towels	Available
	Paper towels	Available
	Disinfectant liquid/gel	Available
NOISE WASTE MANAGEMENT, HYGIENE & CLEANLINESS	Exterior noise penetration	Low
	Echogenecity	Low
	Colored bin	Available (waste segregation is not compiled by staff)
	Colored bags	Available
	Sharp cutters	Available

	Use of designated spaces for waste disposal	Available
FIRE SAFETY	Fire alarm system	Available
	Fire sprinklers	Available
	Fire extinguishers	Available
	Fire hose	Available and everybody trained to use this.
	Partition	Adequate
	Fire door width	Adequate
	Fire door color	Not marked
Zoning	Available/not available	Available
Security	Electronic surveillance	Available
	Manual surveillance	Available
Power back-up	Generator set	Available
	Emergency lights	Available

PROTOCOLS FOR OPERATION THEATRE SETTINGS

VISITOR'S PROTOCOL FOR OT SETTING

- Visitors entry for patients in Post operative area is restricted to one
- Children below 12 years are not allowed inside the OT complex.
- Visitors suffering from contagious disease (cough and cold etc) are not allowed to enter.
- Only OT chappals / slipper are allowed. Chappals or shoes are allowed only with shoe covers.
- Visitors are not allowed to bring materials such as food, flowers and other materials, which can be a potential source of infections.

PROTOCOL FOR PERSONNEL

- All personnel's including housekeeping staff will wear clean OT attire while entering OT.
- No personnel are allowed to move outside the complex with clean OT attire and come back except in emergency situation.
- Surgeons for surgeries of 4 hours or more will use double gloves.

- Doctors, nurses and technical staff use proper hand wash techniques before handling any patient to prevent cross infection.

PREPARATION OF SURGICAL PROCEDURE

- There should be a documented list of surgical procedure in the hospital
- Surgical patients are first assessed by the surgeons and a provisional diagnosis is made prior to surgery which is documented in the case sheet.
- An informed consent is obtained by the surgeon prior to the procedure and details are written in the consent which is understandable by the patient/ attendant in their language. Consent should also contain type of anesthesia to be used during the procedure.
- Patient identification procedure is used to identify the patient. Two levels- - wrist band with complete information. - Case file with complete information.
- To prevent wrong site surgery mark the site before procedure and it is confirmed from the file & the patient also if unconscious.
- From the file provisional diagnosis is confirmed before proceeding for the surgery to avoid the error of wrong surgery.
- A brief operative notes are written about the procedure performed, post operative diagnosis and the status of the patient before shifting.
- They should be countersigned by the chief Surgeon.
- Post operative plan of care is documented.

POLICY FOR INVASIVE/SURGICAL PROCEDURES

PURPOSE:

To promote patient safety by providing guidelines for verification of correct site, correct procedure, and correct patient for invasive/surgical procedure(s). This policy applies to all invasive/surgical procedures including bedside invasive procedures performed at the facility. This policy does not apply to venipuncture, peripheral IV placement, and insertion of Nasogastric tube or insertion of a Foley catheter.

SCOPE:

All the patients undergoing invasive / surgical procedure

Responsibility:

All the clinical & non clinical staff involved in invasive / surgery patients

Policy:

Scheduling

1. The verification process for correct site procedure/surgery begins with scheduling.
2. The following information is required when scheduling an invasive/surgical procedure:
 - a. The correct spelling of the patient's full name;
 - b. Medical Record number (Date of birth is used when a medical record number is unavailable)
 - c. Procedure to be performed

3. Scheduled procedures that involve anatomical sites that have laterality, the word(s) right, left, or bilateral will be written out fully on the procedure/operating room schedule and all relevant documentation (e.g., consents)

4. Any discrepancies in data should be clarified with the physician.

Pre-Procedure/Preoperative Verification

- If the patient is a minor, incompetent or sedated; has a language barrier; or is a trauma/emergency victim, accurate communication may be impeded. In such cases, the patients' family, health care proxy agent, interpreter, or legal guardian) should complete the identifiers and verify site mark as per Hospital Informed Consent Policy.
- The patient responses will be verified with hospital ID, posted schedule, consent(s), radiographic films, site mark (if applicable), and information in the medical record including history and physical.
- In an emergency situation, consent for treatment is implied, allowing treatment to proceed without obtaining written patient consent.

SITE MARK:

Preferably, completed before patient enters procedure/operating room a site mark is required for all patients having an invasive/surgical procedure that involves:

Procedures For Site Marking:

- a. Pens used for site marking shall be single patient use
- b. Prior to marking the site(s), the physician performing the procedure/surgery verifies the patient's identify, consent(s), medical record data including history and physical, and radiographs (as applicable) to confirm accuracy.

- c. A site mark will be made at or adjacent to the incision site, and must be visible after the patient is prepped and draped
- d. Adhesive markers must only be used as an adjunct to the site marking.
- e. The physician performing the procedure will definitely mark the procedure site prior to induction of anesthesia, using an indelible, hypoallergenic, latex- free, skin marker. The marking shall be clear and unambiguous. It is unacceptable to mark with an "X" or use the word "No". It is recommended that SSSS be used to mark the procedure site(s).
- f. A sterile indelible marker may be placed on the prep tray. In the event the site mark is removed during the surgical/procedure prep, the qualified RN in the presence of the physician performing the procedure.
- g. Patient Refusal Procedures for Site Marking - If a patient refuses to have the site marked, the patient's physician will review with the patient the rationale for site marking.

Procedure For Managing Discrepancies

- A discrepancy at any point must stop the case from proceeding until resolved.
- All team members and patient (if possible) must agree on the resolution(s) to the identified discrepancy.

Removal of the Site Mark - At the end of the case, staff should attempt to remove the site mark in the event that the patient will be having subsequent surgical/invasive procedures

ADMINISTRATION OF ANESTHESIA

SCOPE

- All patients who need to have anesthesia.

STEPS

- All patients for anesthesia have a pre-anesthesia assessment by a qualified anesthetist. After the PAC, the anesthetist writes the patient is fit for surgery or not.
- Type of anesthesia is planned which will be given
- Informed consent for administration of anesthesia is taken.
- An immediate preoperative reevaluation is done.
- During anesthesia monitoring is done of regular and periodic recording of heart rate, cardiac rhythm respiratory rate, blood pressure, O2 Saturation airway Security potency & level of anesthesia.
- Patients post anesthesia status is monitored & documented.
- Patient is transferred from the post operative area as per criteria for transfer from recovery area. • If the patients' condition is unstable and he/ she requires ICU care the same shall be monitored there.
- A qualified individual applies defined criteria to transfer the patient from the recovery area.
- All adverse anesthesia events are recorded monitored for the purpose of taking corrective and preventive actions.

RESEARCH METHODOLOGY

RESEARCH OBJECTIVES

- To analyze time utilization for different phases involved in MOTC from "patient in to patient out".
- To determine the opportunity lost in all the OT during the specified period of data collection.
- To determine scheduled and average slot time given to all the cases performed in the OT and suggest any alterations required in scheduling of the cases.
- To categorize opinion regarding the reasons for delay in OT functioning & Delay In OT procedures.

SAMPLE SIZE

- For analyzing average time utilization for different phases involved in MS-OT, all the surgical procedures were monitored for the month of April.
- For categorizing opinion regarding the reasons for delay in OT functioning & working in the OT.
- A total data of 686 cases during the period of study was examined.
- For calculating opportunity lost and average scheduled time, data of all the 686 patients was analyzed.

RESPONSE RATE:

- The questionnaire formulated to examine the reasons for delay in OT procedures was given to all the surgeons, anesthetists and OT technicians/the nursing staff.
- The response rate was 100% as all Surgeons, Anesthetists and Technician/nursing staff obliged by answering the questionnaire.

BIAS RECORDED:

NONE: all the time recorded and the questionnaires filled are free from any bias.

DATA ANALYSIS

The data obtained from the observation was of a pre-dominantly intuitive nature and thus MS-Excel proved to be sufficient

OPERATION THEATRE UTILIZATION

OVERVIEW

Operating Room utilization is a measure of the use of an operating room that is properly staffed with people needed to successfully deliver a surgical procedure to a patient.

It is obvious that optimum utilization of operating rooms is possible if they are not reserved rigidly for use by a particular department or surgeon as a rule. The operating rooms should further be similar in design and character to make it easy for all surgeons to use them without a new set of conditions. Reason for demand of separate OT suits for different specialties' should be thoroughly debated. There will always be a conflict of interest between the administrative and specialists point of view.

EXISTING THEORIES

According to the existing theories on OT utilization

- The classic definition of OR utilization is the sum of the time it takes to perform each surgical procedure (including preparation of the patient in the OR, anesthesia induction, and emergence) plus the total turnover time, divided by the time available.

As an example, if the average "patient in to patient out" time for a herniorrhaphy is 45 min and the average turnover time is 15 min, then 10 herniorrhaphy cases can be performed in a 10-h period in that OR, for an OR utilization of 100%.

With this definition, if cases extend beyond the scheduled end of the day, the time used after the scheduled end of the day is counted as utilization, even though the hospital may be paying overtime to provide the staffing.

- Strum et al. (1) defined the concepts "overutilization" and "underutilization."

UNDERUTILIZATION is defined as time during the scheduled hours of operation that is not used, and

OVERUTILIZATION is defined as the time used by scheduled cases past the end of the scheduled time. With these concepts we can estimate the economic efficiency of an OR suite

- The standard definition produces the actual utilization—the time that is actually used. Because it is necessary to know the actual case times to perform the calculation, utilization can never be known in advance. In this analysis, we also refer to the scheduled utilization, that is, the predicted utilization obtained when cases are scheduled.
- OR utilization is defined by Donham and colleagues as the quotient of hours of OR time actually used during elective resource hours and the total number of elective resource hours available for use.

DEFINITION :

O.T. utilization

It is defined as Anesthetic plus operating time as a percentage of total actual theatre time.

O.T. utilization is sum total of Anesthesia induction time, Positioning time and Procedure time as a percentage of total actual theatre time.

Methods of O.T. utilization

O.T. utilization can be calculated on the basis of various parameters. These are

1. Total O.T. utilization Time
2. Raw utilization

3. Adjusted utilization

1) Total O.T. Utilization Time is sum total of time when the patient is wheeled in, Anesthesia induction time, Positioning time, Procedure time and the time patient is wheeled out

Total O.T. utilization for anesthesia is sum total of Anesthesia induction time.

Total O.T. utilization for cleaning the O.T. is sum total of time from patient out of room to room clean-up finished and next case taken.

2) Raw utilization is the total minutes of elective cases performed within OR time divided by the minutes of allocated block time.

Raw Utilization = total minutes of cases performed ÷ total minutes of OR time allocated

Raw Utilization = Total O.T. utilization in Percentage (Routine Cases)

3) Adjusted utilization uses the total minutes of elective cases performed within OR block time, including "credit" for the turnover times necessary to set up and clean up ORs.

Adjusted Utilization is sum total of Pre Op waiting in OT , Anesthesia induction time , Positioning time ,Procedure time, Shifting to recovery Room, OT clean time and Post Op waiting in OT (last three come under credit time)

Adjusted Utilization = [total minutes of cases + "credit time"] ÷ total minutes of OR time allocated

2) TOTAL WORKING TIME OF MS- OT is equivalent to Number of routine O.T.s multiplied by per day working hours of O.T. multiplied by Total no. of working days.

- **Total O.T. required time** is sum total of Pre Op waiting in OT, Anesthesia induction time, Delay after induction, Positioning time, Delay after position ready, Procedure time, Post Op waiting in OT, Shifting to recovery room and OT clean time.
- **Procedure Start time** is the time the patient's Anesthetic commences having a general anesthetic or combined spinal epidural anesthesia (CSEA).
- **Start time** is the time when patient wheeling in of 1st case.
- **Procedure Finish time** is the time the patient leaves the operating room (or the time the patient enters recovery, as the nearest equivalent).
- **Case End time** is the time when patient wheeling out of last case.

3) OPPORTUNITY LOST: It is defined as the delay from wheeled in time of the patient to the incision time from the actual time that should be utilized.

Factors affecting utilization rates include: the accuracy of estimated case times, cancellation rate, number of add-ons available to fill gaps, whether longest cases go first, the time of day as utilization typically is highest in the morning and lowest in the evening, and other constraints (i.e., surgeon can only use one OT or start at 11am).

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Points kept in mind while analyzing theatre utilization, ask:

- Is the flow of patients managed effectively with minimum delays between cases? • Delays may be due to a variety of reasons, such as poor management, delays for equipment, poor communication between theatres and wards.
- Do theatre lists consistently start late and/or finish early? Late starts may be caused by pre-operative visiting of the patient by the anesthetist and surgeon.

- Are sufficient cases booked to use 100% of the capacity of the major constraint? • If theatres are the main constraint, lists should be booked to use 100% capacity. • Is case mix planned to take account of constraints and availability of essential resources e.g. C –arm?
- Are too many cases booked, or is the case mix inappropriate to fit into the allocated theatre time? • Is there sufficient capacity to meet demand? • Where theatres are not the constraint, how can resources be used in other ways, e.g. using spare capacity on inpatient lists for day cases?
- Factors affecting utilization rates include: the accuracy of estimated case times, cancellation rate, number of add-ons available to fill gaps, whether longest cases go first, the time of day as utilization typically is highest in the morning and lowest in the evening, and other constraints (ie, surgeon can only use room 12, or start at 11am).

DATA ANALYSIS

Flow Process of Activities of Operation Theatre

Study was conducted in one phase which was used to address the study objectives. Data analysis in the first phase, observation study by the analyst in the MS- OT was done. For Operation Theatre Time Utilization Study 686 cases were observed.

- Observed time utilized for different procedure in MS- OT from "patient in to patient out".
- Calculating the OPPORTUNITY LOST in every OT and making a comparative analysis.
- Making a comparative study of the scheduled and actual time allotted to all the cases operated in the OTs.
- Analyzing the reasons for delay in OT functioning with the help of SELF observation.

Operation Theatre Utilization Study

A time and motion study of 686 operations was carried out in Phase I.

The actual time patients spent in various activities while in the Operating Theatres were measured such as Operation time (previously decided), Patient in room (Theater in), Anesthesia Start/Anesthesia induction, Position Start/Surgical preparation, incision time, Patient Out of Room (Theatre out).

All the stages were identified starting from the time the patient was entered in MS- OT to the time the patient left the operation theatre. In last phase, to see the utilization and to make recommendations.

METHODOLOGY

Methods

This study was done prospectively over a period of 30 days in the MS-OT complex, Fortis Hospital, Mohali.

- It is an observational study for a period of 30 days.
- Operation theatre utilization was studied with respect to the starting and closing of the procedure, opportunity lost, delay in starting of the OT and reasons thereof.

1) FOR OT UTILIZATION

Total no of OT in MS- OT= 9

Per day working hours of OT= 12 hrs

No of days for which data has been collected= 30 days

• FOR DELAY OF CASES:

Cases that are started 30mins late from the scheduled slot are considered to be as delayed cases.

The 30mins is taken as standard according to FOSS.

RESULTS:

Total working time of each OT- **12 hrs.**
(21600 mins.)

- OT1 – Total utilization time- 12769 mins.
- OT2 – Total utilization time- 3188 mins.
- OT3 – Total utilization time- 11625 mins.
- OT4 – Total utilization time- 12495 mins.
- OT5 – Total utilization time- 13536 mins.
- OT6 – Total utilization time- 12449 mins.
- Vascular OT- Total utilization time- 9447 mins.
- PR- OT – Total utilization time- 6108 mins.
- ESWL Room – Total utilization time- 185 mins.
- Trauma OT – Total utilization time- 5140 mins.

ACTUAL TIME WASTED-

Total time of OT – The time utilized in each OT:-

- OT1→ $21600 - 12769 = 8831$
- OT2→ $21600 - 3188 = 18412$
- OT3→ $21600 - 11625 = 9975$
- OT4→ $21600 - 12495 = 9105$
- OT5→ $21600 - 13536 = 8064$
- OT6→ $21600 - 12449 = 9151$
- Vascular OT→ $21600 - 9447 = 12153$
- PR-OT→ $21600 - 6108 = 15492$
- ESWL Room→ $21600 - 185 = 21415$
- Trauma OT→ $21600 - 5140 = 16460$

TOTAL CASES DELAYED(wheel in time -to-incision time)

As the standard time set by FOS is 30 mins. So any case which starts after 30 mins. is considered to be as a delayed case

- **Total delayed cases calculated in the month**

of april 2015 are:- 369

- **Total no. of cases = 686**

- **Total no. of cases delayed in % =**

$369/686*100 =$

53.79%

RECOMMENDATIONS:

- Nurses should be trained so as to finish work quickly in a proper given time.
- Pre- maintenance or a checklist of the machinery should be maintained on daily basis. Then it should be signed by the operator/technician if everything is working properly.
- During cleaning time of OT all the instruments should be checked properly by the staff

on duty. So that anything missing can be brought before the doctor starts the procedure.

- Topics like “Importance of punctuality and Professionalism” should also be included in daily meetings of the staff and doctors.
- Punching machine should be installed in each OT. So that proper check on doctor’s arrival time can be noted & records should be checked on weekly/monthly basis.