

**Summer Training at
Narayana Multispecialty Hospital,
Jaipur**

OT Scheduling Through HMIS Software

**By
Anirban Kundu**

**Under the guidance of
Dr. Sandeep Narula**

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



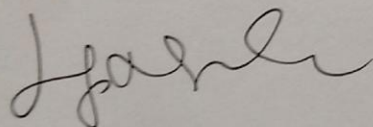
**The IIHMR University, Jaipur
2016**

CERTIFICATE

This is to certify that Dr. Anirban Kundu has undergone Summer Training in Narayana Hospital, Jaipur from 1st April 2016 to 31st May 2016.

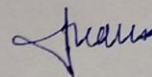
The candidate himself completed the project assigned to him during Summer Training. His approach to the project was sincere and proactive. This summer training is partial fulfillment of the course requirement recommended for the award of MBA in Health and Hospital Management.

I wish him success in all his future endeavors.



Dr. Sandeep Narula
Associate Professor

IIHMR, Jaipur



Col. (Dr.) Ashok Kaushik
Dean (Academic & Student Affair)

IIHMR, Jaipur

NH/HRD-Off/2015/296

Date: 1st June 2016

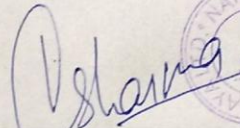
TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Mr. Anirban Kundu** has completed his summer internship training in Operations on "OT Scheduling through HMIS software" Successfully in Narayana Multispecialty Hospital, Jaipur from 1st April 2016 to 31st May 2016.

His work during the Period was commendable and appreciable. His character and conduct was good.

We wish him success in his future endeavors.

For Narayana Multispecialty Hospital, Jaipur



Vishnupriya Sharma
Deputy General Manager-Human Resources

PREFACE

Summer internship is an integral part of MBA-HM curriculum. As a part of the course, the students of first year are required to undergo summer placement at any reputed organization to get in depth exposure to various departments of the organization and understanding of health care delivery system and its functions.

The major objectives of the summer internship are as follows:

1. To understand and learn day to day operational management of a Hospital/ Health Care organization and its service contents.
2. To identify issues/problems with certain operational areas.
3. To acquire more knowledge on roles and responsibilities of key players and stakeholders in the hospital.
4. To gain perspective in the functions of various departments by interaction with key stakeholders, policy makers, academicians and researchers.
5. To work on a Project assigned by the summer training organization.

ACKNOWLEDGEMENT

The internship opportunity we had with Narayana Multispeciality Hospitals, Jaipur was a great chance for learning and professional development.

I feel deeply privileged in expressing our deep sense of gratitude to Dr. Devi Shetty (CMD Narayana Group), Mr. Arunesh Punetha (Zonal Director) and Dr. Mala Airun (Clinical Director) Narayana Multispeciality Hospital, Jaipur for their expert guidance and encouragements which helped in the process of making this report. Without their support, exploring such a vast organisation could not have been possible

I would like to express my deepest gratitude to Mr. Subhasis Bhattacharya, Mr. Gaurav Shiva, who guided me and gave me the project and helped me throughout the work.

I am also grateful to all the department heads and staff for giving me time in spite of their hectic schedule. Without their active co-operation and participation it would not have been possible to accomplish my task.

My sincere gratitude to my mentor **Dr. Sandeep Narula**, for his constant encouragement.

Sincerely
Dr. Anirban Kundu

1. ORGANISATIONAL PROFILE

Narayana Multispecialty Hospital, a branch of Narayana Health (Head Quartered in Bengaluru, India), a privately owned hospital in Jaipur, estd in 2010, is a perfect blend of technological excellence, complete infrastructure, competent care and heartfelt hospitality - this is how the people, whom the hospital has been fortunate to serve, define the hospital.

It is a 290 bedded multispecialty tertiary care hospital, located at Pratap Nagar within a sprawling campus of 4.7 acres offering high quality affordable medical care to the people within Rajasthan and bordering states as well.

Narayana Multispecialty Hospital, Jaipur was awarded the International accreditation from **Joint Commission International (JCI)** on 21st July 2012, making it the first hospital in Rajasthan to receive this prestigious recognition. It got reaccredited from JCI in 2015. A JCI accreditation provides assurance that the standards, training and processes at the hospital meet the highest international benchmarks.

1.1 Vision: "Our vision is affordable quality healthcare to the masses worldwide."

1.2 Mission: "To deliver high quality and affordable healthcare services to the broader population by leveraging our economies of scale, skilled doctors, and an efficient business model"

1.3 Values: Core values are represented by the simple acronyms **iCARE**

- i- Innovation & efficiency
To continuously reduce the cost of delivery of high quality health care and improve our reach.
- C- Compassionate care
In providing accessible service that makes a difference to our patients.
- A- Accountability
To honour commitments to our patients, employees and investors with integrity and transparency.
- R- Respect for all
Recognise the contribution of every employee and respect the rights as well as the dignity of every patient and employee.
- E- Excellence as a culture
Where we individual excel to collectively ensure the highest quality of consistence and reliable services to our patients and sustainable values to all our stakeholders.

1.4 The ultimate goal of NH : Service Excellence
Patient satisfaction

1.4 Scope of Services:

- Anaesthesia & Critical Care
- Department of Cardiac Science
 - Minimally Invasive Cardiology
 - Cardiac Electrophysiology
 - Paediatric Cardiology
 - PTCA
 - Coronary Angiography
 - Cardiothoracic & Vascular Surgery
Paediatric & Adult
- Department of ENT
- Department of Gastrointestinal Sciences
 - Medical Gastroenterology & Haematology
 - G.I & Laparoscopic Surgery
 - Bariatric Surgery
- Department of Neuro Sciences
 - Neurology
 - Neurosurgery
- Department of Paediatric
 - Neonatology
 - Paediatric
- Department of Paediatric Surgery
- Department of Renal Sciences
 - Dialysis
 - Nephrology
 - Urology
 - Transplant Services
- General & Laparoscopic Surgery
- Institute of Bone, Joint & Spine
 - Hand & Microvascular Surgery
 - Joint Replacement
 - Spine surgery
 - Sports Medicine & Arthroscopy
- Internal Medicine
- Obstetric & Gynaecology
- Pulmonary Medicine
- Department of Rheumatology
- Onco-Gynaecology
- Ophthalmology
- Dermatology

➤ **ALLIED SERVICES**

- Dietetics
- Emergency & Trauma
- Radiology & Imaging
- 1.5 Tesla MRI
- 64 Slice CT Scan
- Cath lab
- Laboratory Sciences
- Physiotherapy

1.5 DEPARTMENTAL SERVICES:

1.Outpatient Department:

There are 4 decentralised OPD :

1. North OPD
2. South OPD
3. Cardiac OPD
4. Nephrology OPD

OPD Timings: 9am to 5pm.

Average no. of OPD patients 300-350 per day (Including old and new patients)

2.In Patient Department:

- Male Medical Ward:
Location: Lower ground floor.
Bed Capacity: 19 Beds
- Male Surgical ward:
Location: Lower ground floor
Bed Capacity: 16 Beds
- CCU
Location: Ground floor
Bed Capacity: 20Beds
- MICU
Location: Ground floor
Bed Capacity: 20 Beds including 2 bed 0063s for isolation
- Female Medical & Surgical ward
Location: 1st Floor
Bed Capacity: 36 (18+18) Beds
- ANC Ward
Location: 1st Floor
Bed Capacity: 8 Beds with 2 Beds in Labour Room
- Paediatric Ward
Location: 1st Floor
Bed Capacity: 5 Beds

- PICU
Location: 1st Floor
Bed Capacity: 5 Beds
- NICU
Location: 1st Floor
Bed Capacity: 6 Cribs
- ITU
Location: 1st Floor
Bed Capacity: 21 beds plus 2 beds for isolation
- Semi Private Ward
Location: 1st Floor
Bed Capacity: 36 Beds including 4 day care beds.
- KTU
Location: 1st Floor
Bed Capacity: 3 Beds
- Private Ward
Location: 2nd Floor
Bed Capacity: 18 Beds
- CTVS Male & Female Ward
Location : 2nd Floor
Bed Capacity: 23 Beds
- Ortho General Ward
Location: 2nd Floor
Bed Capacity: 6 Beds
- Neuro General Ward
Location: 2nd Floor
Bed Capacity: 6 Beds

3.Emergency Services:

Location: Lower ground floor

Entrance : Separate entry from the main road

The Emergency Department is a well equipped 10 bedded department. 3 beds for each triage category Red , Yellow, Green and 1 bed for isolation

Staff: 1 Emergency Incharge, 2 MO , 1 Nursing Incharge, 9 Staff nurse, 2 House-Keeping staff

Ambulance service is outsourced.

4.Operation Theatre:

There are 5 functional OTs in the 1st floor and 4 functional OTs in the 2nd floor out of total 11 OTs

Location: 1st and 2nd Floor

Easy access to CCU, Blood Bank, Emergency and CSSD

ITU is attached to the the OTs located in the 1st floor

Manpower: 1 Chief Head of the Department, 21 Anaesthetists, 1 OT Manager, 3 Perfusionists, 21 OT Technicians, 52 Staff Nurse, 5 House Keeping Staff.
No of Surgeries: 480-500 surgeries per month with around 150 cardiac surgeries every month.

5.Catheterisation Lab:

Location : Ground Floor

All Invasive Procedures are done in cath lab such as Angiography, Angioplasty , Cath Study, Electro Physiological Study.

Door to Balloon Time for emergency patients is 90 minutes.

Average patients – 10-12/day

Temperature: 17-20 degree Celsius.

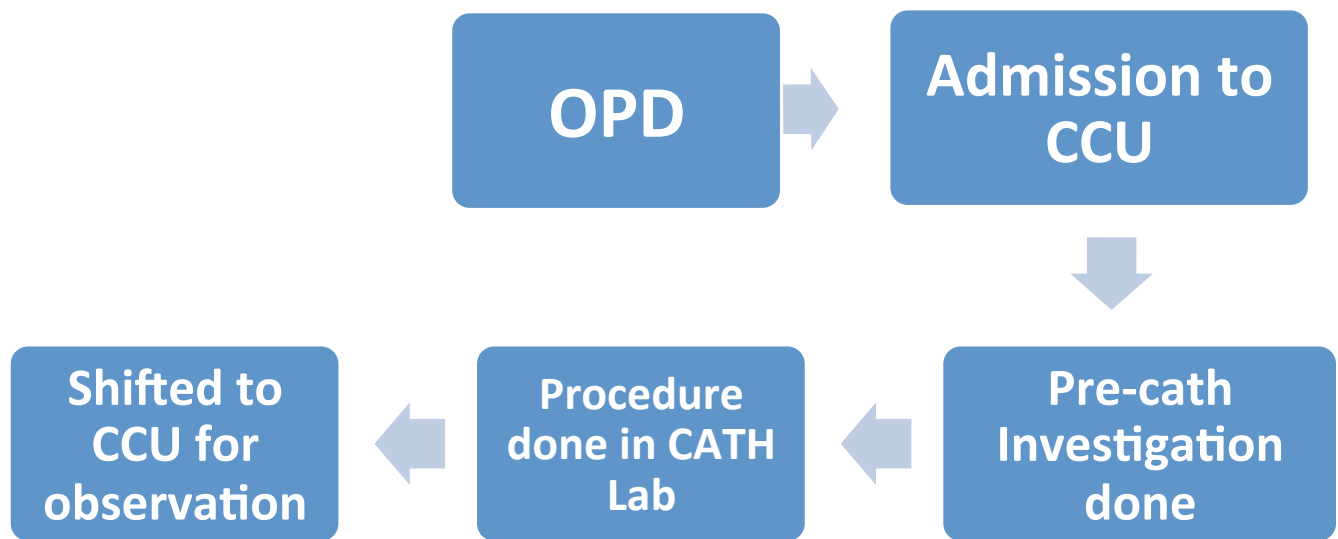
TAT: In between 2 cases: 45-50 mins

Angiography : 10-15 mins

Angioplasty: variable

Maintenance is done regularly every 3 months.

Process Flow:



6.CSSD

Location: Lower Ground Floor

Total Area is divided into 4 Zones:

- Zone I. (Dirty Utility) Reception , Inspection and Documentation
- Zone II. (Clean Area) Assembly and Packing
- Zone III (Sterile Area) Sterilisation
- Zone IV (Issue Area) Storage and distribution

Check for proper sterilisation

- Bowie dick test
- Leak test
- Sterilisation test
- Batch monitoring test

7.Radiology Department:

Location: Lower Ground Floor

Area:

- Reception Area
- Console Room
- Imaging service room
- Changing room-2

Different rooms for X-Ray, Mammography, MRI, CT Scan.

8.Laboratory:

Location: Ground floor

All laboratory services related to Biochemistry, Microbiology, Histopathology and Haematology.

Blood Bank is attached with the laboratory.

9.Physiotherapy and Rehabilitation Centre:

Location: Lower ground floor

Well trained team of 6 physiotherapist managing the department and providing rehabilitation therapy for joint disease, stokes, trauma etc.

Other facilities :

- Wax Therapy
- Hydro collator- hot pack
- Interferential Therapy
- IFT- Pain Relief
- Ultrasound therapy- piezoelectric effect
- TENZ
- Muscle Stimulator
- SWD etc

10. Medical Record Department:

Scope of Services:

- Maintenance of all medical record
- Storage of records : 1) OPD: 3 years
2) IPD: 5 years
3) Death/MLCs: lifetime
- Maintaining the integrity and confidentiality of all medical record
- Maintenance of MLC cases
- Numbering and filing
- Completion of all incomplete records.
- Arrangement is according to Admission No.

11. Food and Beverages:

Location: Lower ground floor

Scope of services:

- To provide well balance nutritious food to all in patients as well as patients for dialysis as per their needs.
- To serve staff and patients attendants
- To helps in improving the patients condition by providing hygienic , proper and nutritious food as prescribed by the dieticians.

Provide 5 servings for the general ward patients and 8 servings to the semi private and private ward patients.

Types of diet:

- Normal full diet
- Liquid diet
- Soft diet
- Diet for diabetic patients
- Diet for renal patients
- Diet post cardiac surgery patients.

12. Housekeeping:

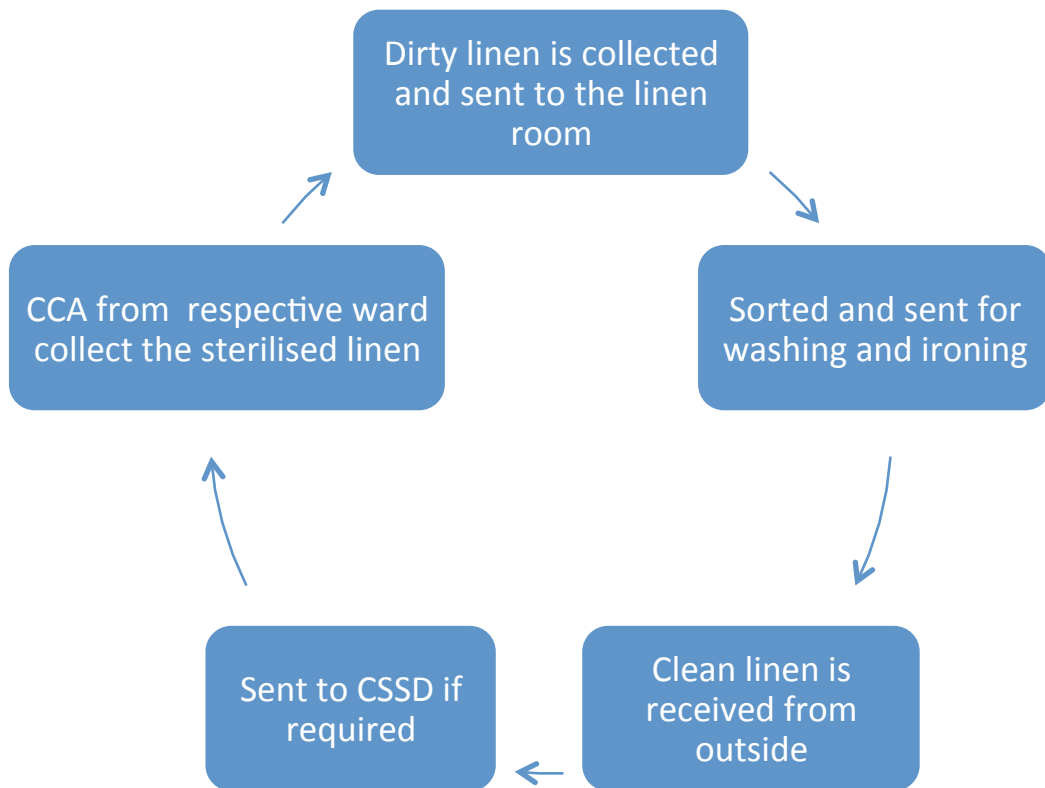
Housekeeping department is outsourced

Services provide:

- Maintain hygiene of the patients and the hospital
- Helping in patients preparation
- Infection control
- Waste disposal

13. Linen and Laundry:

Linen and laundry department is outsourced



Availability of coloured coded bags in each department. Orange colour is for serology positive patients and green bags for serology negative patients.

14. Pharmacy:

The hospital 3 different types of pharmacy:

- OPD Pharmacy
- IPD Pharmacy
- OT Pharmacy

Functions:

Dispensing of drugs to all the admitted patients.

Dispensing of drugs for the OPD patients.

Demand estimation according to the formulary, in the absence of formulary, establishment of specification for drug procurement

Furnishing of new drug information to consultants and other professional staff

Quality control of drugs purchased

15. Diagnostic Services:

Location: Ground Floor

Scope of services:

- Ultrasonography
- TMT
- Electrocardiography
- Echocardiography
- Electroencephalography
- Uroflowmetry
- Electromyography
- Pulmonary function test

Operational timings: 9 am to 5 pm.

16. Dialysis Department:

Location: Lower ground floor

Machines: 30

Bed Capacity: 20 beds including 4 beds for serology positive patients

No. of procedures done per day: 55-60 dialyses per day

Manpower: 10 staff nurse, 7 Technicians, 2 MO, 4 HK

TAT: 15 mins Pre, 4 hrs Dialysis, 15 mins Post

Shift of dialysis: 7 am to 12 noon, 12 noon to 5 pm and 5pm to 8 pm.

Every patient is provided with a meal, included in tariff and the meal is prescribed by the dietician.

17. Mortuary:

Location: Lower ground floor

Temperature: 5-6 degree Celsius

Capacity: At a time four dead bodies can be kept together

Functions:

- To keep the dead bodies in the hospital until the relatives claim them.
- To keep the dead bodies for post mortem (MLC Cases).

18. Security Services:

Security service department of the hospital is outsourced.

Functions:

- To provide security services to all the staff, patients, relatives and visitors
- To protect the hospital property within the premises
- To analyse threats and vulnerability in conjugation with the managements , police and others
- To control the movement of vehicular traffic inside the premises.

19. Billing and Finance Department:

Location: Ground floor

Operational timings: 9am to 5 pm for the finance department
24 hr IP billing service.

Functions:

- To provide salary to all the staff in a timely manner
- To provide payment to all the vendors and contractors
- Tracking the expenses of in patients on daily basis
- Timely discharge of patients related to financial clearance
- To provide accurate and timely financial information for decision making.

20.Maintenance Department:

Location: Lower ground floor

Functions:

- To maintain continuous electric supply to the hospital.
- To maintain the chilling plant room of the hospital
- To maintain the supply of medical gases
- To maintain the proper functioning of STP

Operational timings: 24hr.

Infrastructure:

Low tension room

Generator panel: 2 generator of 750 KVA each

Diesel tank- 24 kilolitres capacity

Sewerage treatment plan

Desk panel- control air handling unit

Chilling plant room – 2 nos each 350TR

Gas manifold room :

Sr No.	Types of Gases	Types of cylinders	Pressure/Weight	Cylinder (Color Code)	Pipeline (Color Code)
1	Oxygen	A/B/D	110-125 kg/sqcm	Black with white neck	Yellow with white band
2	Nitrous Oxide	D/A	40-50 kg/sqcm	French blue	Yellow with blue band
3	Carbon Dioxide	A/D	2/30 kg	Black with white band & grey neck	
4	Compressed air		1500 litres capacity		Light blue with white & black band
5	Vacuum station		3000 litres capacity		Light blue with black band
6	Air dryer		45 CFM capacity		
7	Bacteria Filter		45 CFM capacity		

21. Human Resource Department:

Location: First floor, Admin Block

Functions:

- Recruitment based on requisition form from respective department duly signed by incharge of the department, HR and facility director
- Induction and training programs- 3 days induction program for all new employees
- Performance appraisal ones in a year in the month of March
- Employee engagement activities such as birthday celebration, open house, and also on the job trainings such as fire safety. BLS training
- Grievance Handling
- Conduct employee exit interview

22. Fire safety Department:

Location: Lower ground floor

The hospital has 7 fire exist door in each floor . A total 26 functional fire exist doors

Sprinklers are located in the entire hospital with a distance of 6 mts between two sprinklers and burst at 68 degree Celsius

Smokes detectors are also located in the entire hospital.

Fire Safety Equipments:

Project: OT Scheduling through HMIS

- Horse Reel Drums 21
- Jockey Pump 01
- Alarm Valve 05
- Double Hydrant Valve 28

Hospital follows “PASS” and “ RACE” protocols.

PASS: Pull Aim Squeeze Sweep for operating a fire extinguisher

RACE: Rescue Alarm Contain Extinguish, Evacuate



PROJECT REPORT

A Study on Improvising Operation Theatre Utilization By Incorporation of OT-HMIS Module In A Multispecialty Hospital

INTRODUCTION

Operation Theatre is the most vital and imperative facility of a hospital. It is the heart of any hospital where all the surgical procedures are performed. The concept of “operating theatres” has its origin in history around 15th century. Earlier there used to be an elevated table and all around raised chairs for students to see the operation. Modern OR is said to have descended from the Roman Military tent and hospital system. Like all other medical facilities, Operation theatres are also the offspring of wars. Subsequently the word “Operation theatre” (OT) has been replaced by “Operation room” (OR) which refers to the room in which surgery takes place. The operating room with ancillaries is called operation theatre/suite and the total number of operation theatre/suite(s) together form an Operation Unit/Operation Theatre complex. The concept of these conventional Operation theatres has seen a drastic drift to the modern operating rooms with Laminar airflows and State of the art equipments. There has been transformation of the operation theatres as the place where surgical procedures are conducted, to operation theatre complex where not only surgical procedure are performed but also patients care and safety are of essence. Enhancing the efficiency of operation theatre has always been a challenging process especially in a quick changing healthcare sector with increased patient care complexity.

Scheduling of Operation theatre is an important factor contributing to the operation theatre efficiency. It determines the average length of common operations and filling them into calculated available operating time. The scheduling of Operating theatre plays an important role towards the patients satisfaction by minimizing his/her total waiting time before undergoing major or minor operations. Poor scheduling of operation theatre may cause pre-operative delays. The operation theatre is a high revenue generating department within the hospital. Considerable resources are wasted if operating room is not used effectively. Thus quality of care in surgical unit is a measure of timely, safe and best care to the patients. The critical concern for hospitals is improving quality while simultaneously reducing cost. Different organizations use different methodologies and tools for implementing a quality management and programs for quality improvement such as seven quality tools like control charts, pareto analysis, cause-effect analysis, failure mode effect analysis, poka yoke, flow chart etc). One of the methodologies used for hospital operations process is Six Sigma, which constitutes a number of approaches and techniques for quality improvement.

Managing the operation theatre, however is hard due to the conflicting priorities and the preferences of its stakeholders. Moreover, health managers have to anticipate the increasing demand for surgical services caused by the aging population. These factors clearly stress the need for efficiency and necessitate the development of adequate planning and scheduling process.

“Management of Operation theatres requires the coordination of human material resources in such a way that surgery can be performed efficiently, cost effectively, and safely” within the rules of clinical governance of standards.

JUSTIFICATION OF STUDY

Management of operation theatre is hard due to the conflicting priorities and the preferences of its stakeholders. The staff managing/scheduling the cases in operation theatre were facing many problems. Normal OT timings are from 08:30 a.m. to 05:00 p.m. Staff raised many criticisms reflecting lack of communication among the different groups or stakeholders. All this reflected a non-coherent and poor workflow within the theatres. It was essential to address this area seriously. Trying to understand the operation theatre status and the contributing factors to this challenge. I decided to start with process mapping.

Review of Literature

Operating Theatre scheduling is a major contributing factor to enhance the efficiency of operating theatres. Accurate and real time scheduling assist in predicting staffing needs, ensuring availability of required equipment and supplies and thus contribute to a smooth running operating theatre[1]

Magerlein and Martin [2] review the literature on surgical demand scheduling and distinguish between advanced scheduling and allocation scheduling. Advance scheduling is the process of fixing a surgery date for a patient, whereas allocation scheduling determines the operating room and the starting time of the procedure on the specific day of surgery.

An accurate schedule must list realistically the starting and ending time of each surgery. In addition, conflicts of schedules shall be resolved by the operating theatre manager [Malhorta, 2006]. Schedules need to be re-arranged according to agreed on principles among all surgeons, on condition that guidelines are developed to define elective versus non-elective cases. [3]

Accordingly literature doesnot question or challenge the level of urgency however recommend classifying surgeries as elective, where patient condition will not be affected as a result of delaying the surgery for a minimum of forty-eight hours, and non-elective. Under the concept of creating a realistic operating schedule, Malhorta (2006) reflected on the importance of having a real time based schedule which is essential to predict human and resource needs.

The real time schedule requires accurately specifying the starting and ending time of surgeries with as much as possible accurate surgery duration. This real time requires timely updating as the day goes on. In addition, literature reflected the importance of defining the start time of each surgery and the impact of providing a precise duration to avoid confusion, allow proper allocation and distribution of surgeries and standardise data collection [4]. Moreover, the importance of developing policies to streamline scheduling procedures was highly stressed.

The procedure requires setting certain guidelines of what cases are to be scheduled as first day case, what is an elective case versus non elective.[5] listed four important steps to assist in scheduling urgent cases and the related process to flow. Of these steps he included patient medical condition, evaluating patient waiting time, impact on OT efficiency and patient safety. Within 13 these definitions it is essential to secure the surgeons agreement and commitment to abide by these guidelines and accordingly to abide by the scheduling process. This will reflect caring for all the surgeons similarly (Dexter et al, 2002) [6]. This is important from the surgeons' perspective, their surgery is the ultimate goal and the most important to perform (Calms et al, 1992).

An approach to decrease the first case delay along with an accurate recording and booking time with no "to-follow" schedule (Malhorta, 2006) should be put in place. It was categorically rejected, as per literature, to have a "To-Follow" designation of surgery (Malhorta, 2006; Macario, 2010). Managing all these factors besides decreasing staff scheduling variation and ensuring adequate housekeeping services contributed in many studies to decrease the prolonged operating theatre turn-over time (McIntosh et al, 2006).[7]

The turn-over time describes the time delay between the first and the second surgery and measured by calculating the time the first case leaves an operating theatre on the day schedule to the time the second patient enters the same theatre and the impact of this delay on the suspension of all consecutive surgeries which will result in stretching the scheduled time and extending the operating theatre working hours. Macario (2010) [8] score the value of turnover time in his study so that it reflects poor performance if it is more than forty minutes and for good performance it should be less than twenty five minutes.

Blake and Carter [9] elaborate on this taxonomy in their literature review and add the domain of external resource scheduling, which they define as the process of identifying and reserving all resources external to the surgical suite necessary to ensure appropriate care for the patient before and after an instance of surgery. They furthermore divide each domain in a strategic, administrative and operational level, although these boundaries may be vague and interrelated.

Przamycki [10] structures the literature on operating room scheduling based on general areas of concern, such as cost containment or scheduling of specific resources.

AIM AND OBJECTIVES

AIM

- To improve the Operation Theatre utilization by incorporation and implementation of OT-HMIS module

OBJECTIVES

The study had the following objectives:

1. To examine the process of scheduling of cases in operation theatre in Narayana Hospital, Jaipur
2. To identify the bottlenecks in the system, in proper and efficient utilization of Operation Theatre
3. To suggest remedial measures for improving the Operation Theatre Utilization

METHODOLOGY AND DATA COLLECTION

- STUDY SETTING: Narayana Hospital, Jaipur
- STUDY PERIOD: April 1st to May 31st 2016
- STUDY POPULATION: Surgery cases
- STUDY SAMPLE: In patient surgery cases between April and May 2016
- STUDY DESIGN: Descriptive, Cross-sectional and combination of retrospective and prospective study

RETROSPECTIVE STUDY

The data of OT Scheduling was analyzed for the month of April 2016. Based on the analysis, problems were identified which were affecting the OT Utilization.

PROSPECTIVE STUDY

Based on the retrospective study, the OT scheduling was mapped for the month of May 2016 by analyzing scheduled and updated list of each day and interviews were conducted with each stakeholder. Along with this, reasons for the problematic areas were being tracked simultaneously on daily basis.

DATA COLLECTION

PRIMARY DATA: Real time data of OT Scheduling was collected for the month of April & May 2016

1. PROCESS MAPPING AND OBSERVATION:

The entire process starting from booking till wheel in of patient in OT was mapped for the month of April 2016. Moreover the cases in the scheduled list and the updated list were observed to analyze the number of problematic areas. These cases were individually studied and analyzed to identify the cause for the same.

2. INTERVIEWS:

Interviews were conducted with each stakeholder to identify and understand the problems faced at their level.

PROCESS MAPPING

Process mapping started with manpower available for efficient and optimum utilization of OT. Total manpower of OT Department is 104.

TOTAL MANPOWER

CATEGORY	NUMBER OF STAFF
Chief Head of Department	1
OT Manager	1
Perfusionist	3
Anesthetists	21
Staff Nurse	52
OT Technicians	21
Housekeeping	5
Total	104

The Operating Theatre (OT) complex is composed of eleven operating theatres out of which eight are functional for high standard clinical care. The theatre receives multiple varieties of surgical cases extending from minor to major ones.

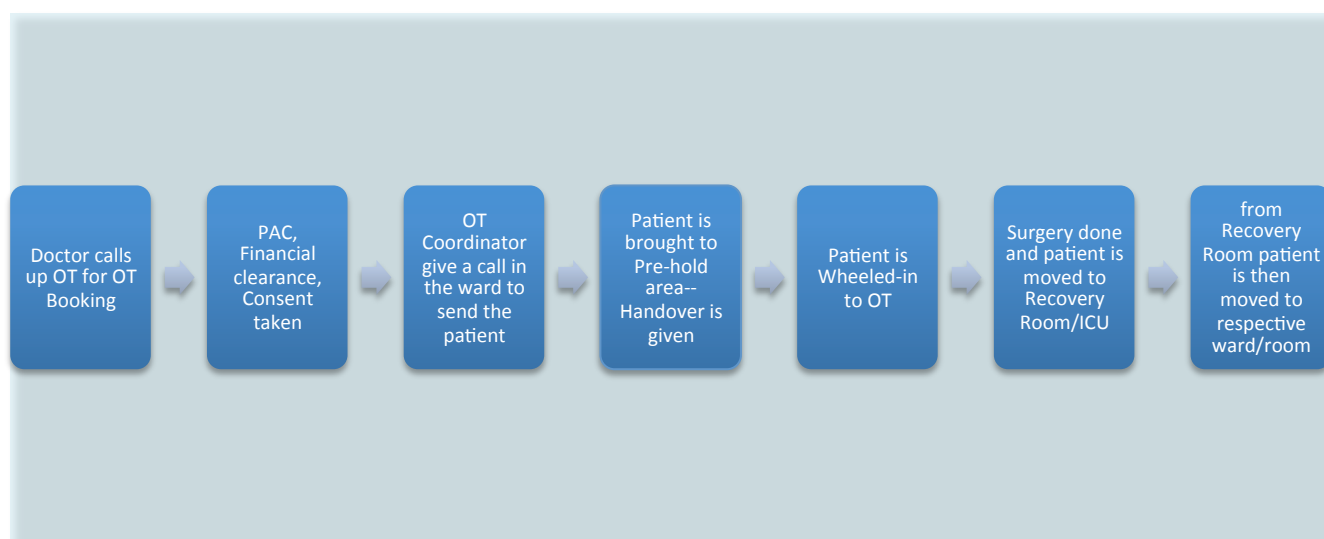
Project: OT Scheduling through HMIS

There are **9 ORs** in the hospital out of which **4 are cardiac OTs**. The standard operating hours are Monday to Saturday from 08:30 a.m. to 05:00 p.m. for all the OR's. Moreover emergency cases are also conducted if need arises at any point of day.

Different OT's are individually designated for different surgeries.

OT Number	Department
1	Cardiac
2	Cardiac
3	Cardiac
4	Cardiac
5	Ortho
6	Gynae/Obs
7	Neuro
8	General
9	Laparoscopy

PROCESS FLOW:



OT Booking:

After taking decision for a surgery of patient, Surgeon/Doctor inform the OT Coordinator for OT booking. OT Booking Register is to be filled by OT Coordinator at the time of booking.

OT Booking Register contains the following heads:

1. Booking time and date & OT No.
2. Name of patient
3. Age/Sex
4. M.R.N. Number

5. Ward
6. Procedure/Surgery
7. Name of the Surgeon
8. Name of the Anesthetist
9. Wheel in time
10. Approximate duration
11. PAC
12. Special requirements if any

STAKEHOLDERS INVOLVED:

1. Surgeon
2. Chief Anesthetist
3. OT Coordinator

Clearances, Investigation and Consent

A typical surgical patient undergoes several pre-operative activities that varies from Physical Examination, Investigations, and Consent taking to different clearances such as PAC (Pre-Anesthetic Check-up), Financial Clearances etc. once all these activities are completed the surgical procedure is performed. At each activity, different stakeholders are involved who contribute in the efficient scheduling of cases in OT.

Clearances: Mainly two clearances are needed before a patient undergoes a surgery in OT.

- PAC (Pre-anesthetic Check up) Clearance
- Financial Clearance

PAC (Pre-anesthetic Check-up)

Prior to administration of any type of anesthesia, the patient has to be checked up by a Doctor Specialist/Anesthesiologist who get information on the physical and mental condition of the patient. Apart from the detailed examination, the check-up also includes getting information on all prior examination made and respective results thereof.

This is rather helpful when making the decision whether the administration of certain type of anesthesia will be contraindicated or possible after appropriate preparation made in order to optimize the patient's condition for the purpose of carrying out the surgery and administering the anesthesia. PAC is done on prior day of surgery and in case of emergency; PAC is done in the OT.

STAKEHOLDERS INVOLVED:

1. Patient
2. Surgeon
3. Anesthesiologist
4. Nursing staff

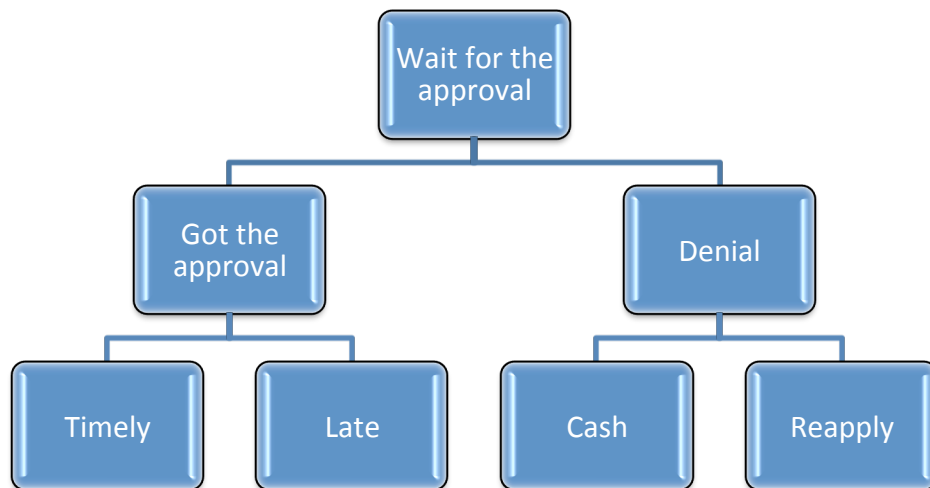
FINANCIAL CLEARANCE:

There are three categories, under which Financial Clearances are done.

- TPA Patients
- CGHS/ESI Patients
- Cash Patients

TPA PATIENTS

TPA patients have to wait for their approval for getting their Financial Clearance. TPA cases can pre-planned or emergency cases. Ideally, surgery should be scheduled and patient should be admitted after the approval has come. In normal cases, the usual time for the approval is 15 mins-6 hours. Delayed approval can take up to 3 days.



STAKEHOLDERS:

- Surgeon(s)
- Patient
- TPA Co.
- Insurance Co.
- Nurses

CGHS/ESI PATIENTS: CGHS/ESI Patients also have to bring the approval.

STAKEHOLDERS:

- Government
- Patient

CASH PATIENTS: Cash patients have to deposit the surgery amount before the admission for surgery.

INVESTIGATIONS

Patients have to undergo certain investigations before undergoing any surgery. Surgeons have to plan the surgery based upon the results of the investigation report.

CONSENT

Prior to the surgery, consent has to be taken by the patient after explaining the need of the procedure and the risk and the complication associated with the procedure. It has to be duly signed and dated by the patient/relative and surgeon. It should be taken a day before the surgery.

Patient Transportation From Ward To OT

On Surgeon's call, OT Coordinator communicates in the wards to send the patient in OT.

Patient is brought to Pre-hold area from the ward where all the documents are checked and antibiotic prophylaxis is given if required. Part preparation is also done and then patient is wheeled in into OT.

STAKEHOLDERS:

- Surgeon
- OT Coordinator
- Nurses
- Attendants

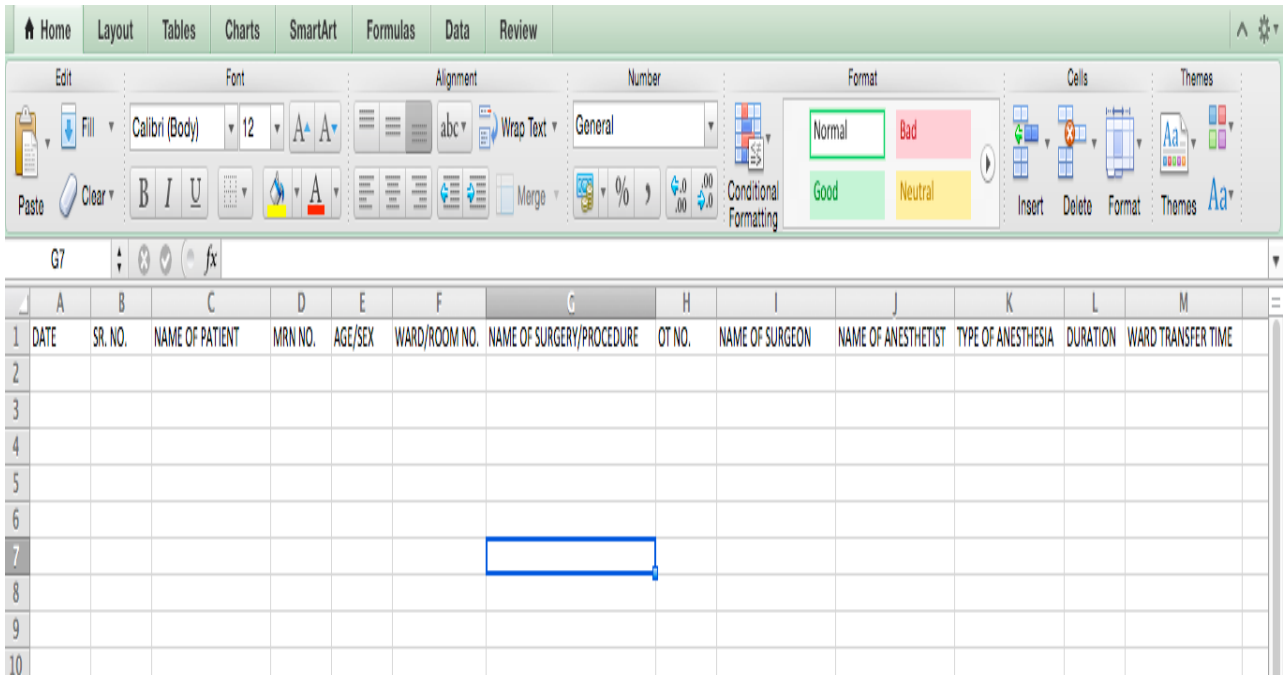
OT Module: HMIS

PRESENT STATUS OF OT MODULE

The current OT Module has various heads as follows:

- OT Booking/reservation
- OT Scheduling (schedule list for OT, wards)
- Patient's Financial clearance
- OT Charge Slip
- OT Reports

Project: OT Scheduling through HMIS



BOTTLENECKS

Bottlenecks can be summarized as follows:

- Cancellation of cases
- Sameday scheduling
- Postponement of cases
- Delay/Preponement of scheduled cases
- Late start of OT for the day

Cancellation

In majority of cases the reason for cancellation of cases was, patient did not turn up at the day of surgery mainly due to high tariffs

Other reasons were:

- Cardiac clearance
- Patient not fit for surgery
- Change of care plan
- LAMA cases

Same day scheduling

Some of the Surgeons have the habit of not booking the OT beforehand and thus scheduled their surgeries on the same day or according to their own convenience.

Postponement of cases

- TPA approval pending
- ESI approval pending
- Investigation reports pending
- Patient late admission

Delays

- Patient late admission/delay in arrival of patient
- TPA Clearance
- Surgeons late arrival
- Non-availability of OT/OT not ready for surgery

RECOMMENDATIONS

Ot Booking:

1. HMIS OT Module is proposed for scheduling the OT cases. Module is designed in such a way that OT will not be booked until all the relevant fields are filled.
2. OT can be booked prior to surgery date as well as on the same date itself.
3. To make the module user friendly, the list to be prepared consisting of surgery, surgery code and tentative duration. As soon as the name of the surgery will be entered, surgery code and tentative duration of the surgery will be automatically displayed on the module.
4. The HMIS software used is called as HINAI WEB which is a part of ICT (Information Collaboration Transformation) Healthcare software

HINAI WEB

HINAI Web is a comprehensive Hospital Information System dedicated to managing the automation needs of virtually every segment of the healthcare environment. HINAI Web has the portability and connectivity to run on virtually all standard hardware platforms, with stringent data security and easy recovery while providing the benefits of streamlined operations, enhanced administration and control, improved response to patient care, cost control, and improved profitability.

FLEXIBLE, EASY TO USE

The system is equipped with agile workflow configuration features that enable rapid deployment across diverse scenarios. The core of HINAI is a comprehensive, multimedia Electronic Medical Record that allows clinical users instant access to real-time patient information for informed clinical

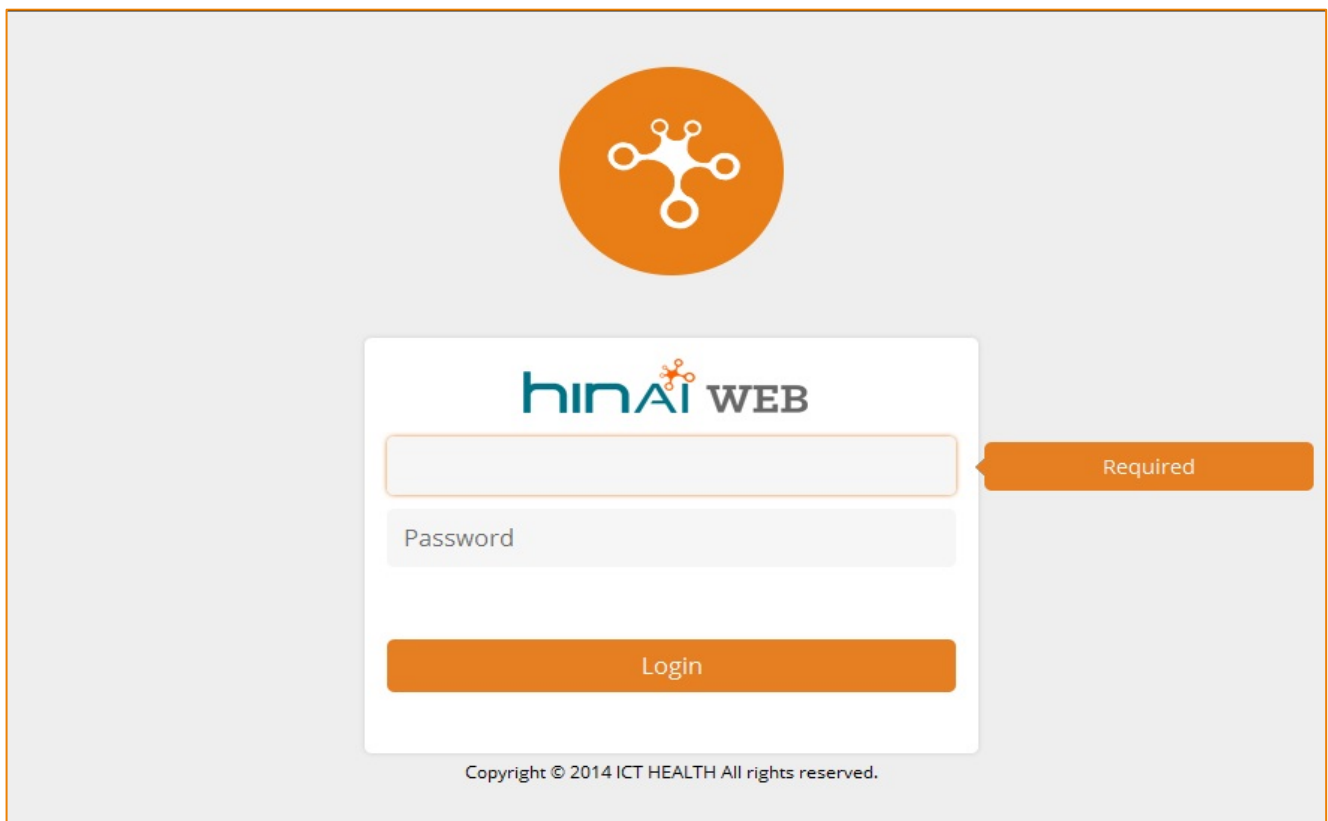
decisions. The consistent and intuitive user interface design of the application is aimed to encourage easy adoption by the clinical fraternity and non-technical users.

INTEGRATED, INTEROPERABLE

It is compliant with industry standards of messaging and interoperability, HL7 and IHE. The system is designed to be multi lingual, multi-tenant and cloud deployable, enabling instant access and mobility via thin clients, handhelds, smart phones and standard personal computers across multiple operating systems and browsers.

ROBUST, RELIABLE

The load testing tool IBM Rational Performance Tester was used for testing user mix levels for 2500 concurrent users to assure the robustness for scalability, screen performance, transactional speed, accuracy and load handling. HINAI Web is fully compliant to healthcare security standards and privacy risk management processes to effectively identify, assess, track and close security and privacy risks that impact the System.



HINAI Login Page

HINAI Patient Administration System (PAS) provides a hospital with a complete system covering all aspects of administrative activity across your hospital, including inpatient and outpatient activity. The HINAI PAS is designed to work across all departments and is integrated seamlessly with other HINAI modules.

The PAS allows for easy management of activity as well as helping to eliminate breaches, reduce bottlenecks and facilitate paper-lite or paper free working.

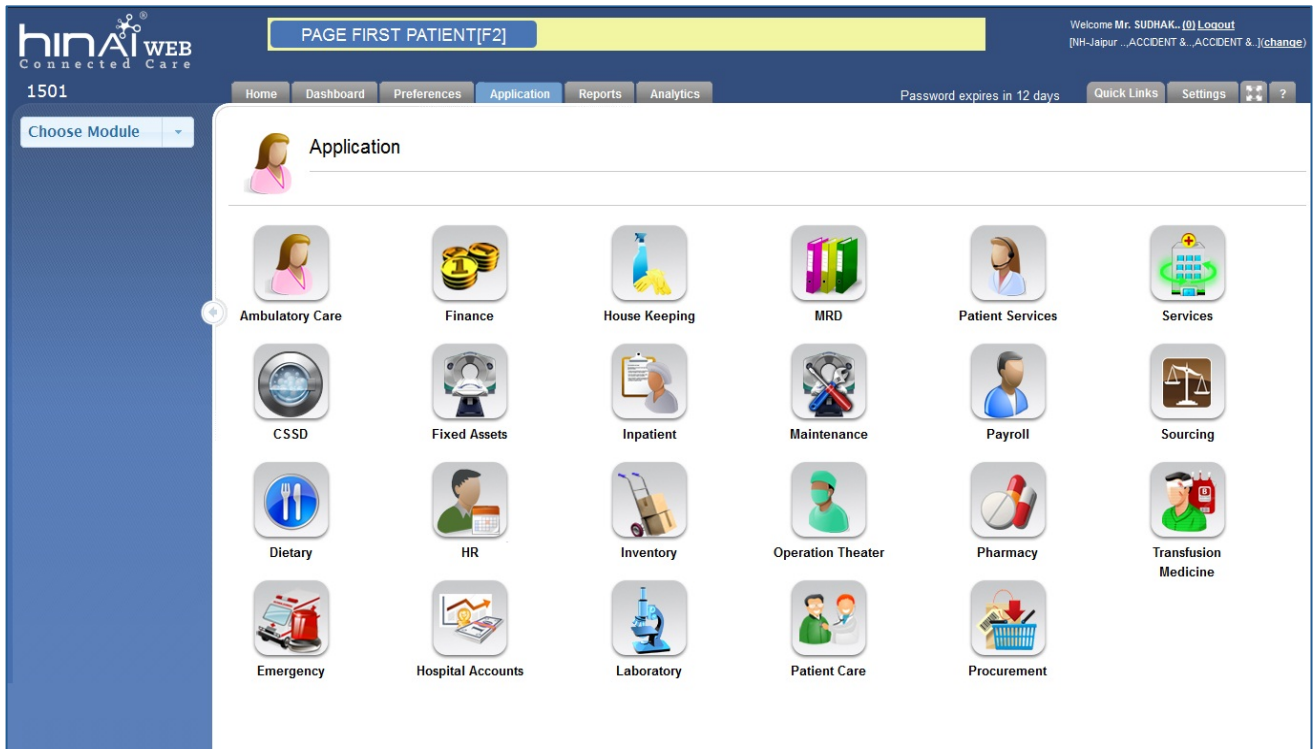
- Manages activity and eliminate breaches
- Maintains master patient index centrally
- Schedule resource across an entire location with just one click
- Connects the patient and care provider through mobile app and enables the care provider to share clinical and administrative documents
- Easily monitors patient flow from admission request to admission to discharge
- Reduce discharge delays by availing all discharge responsibility to respective groups

MIS

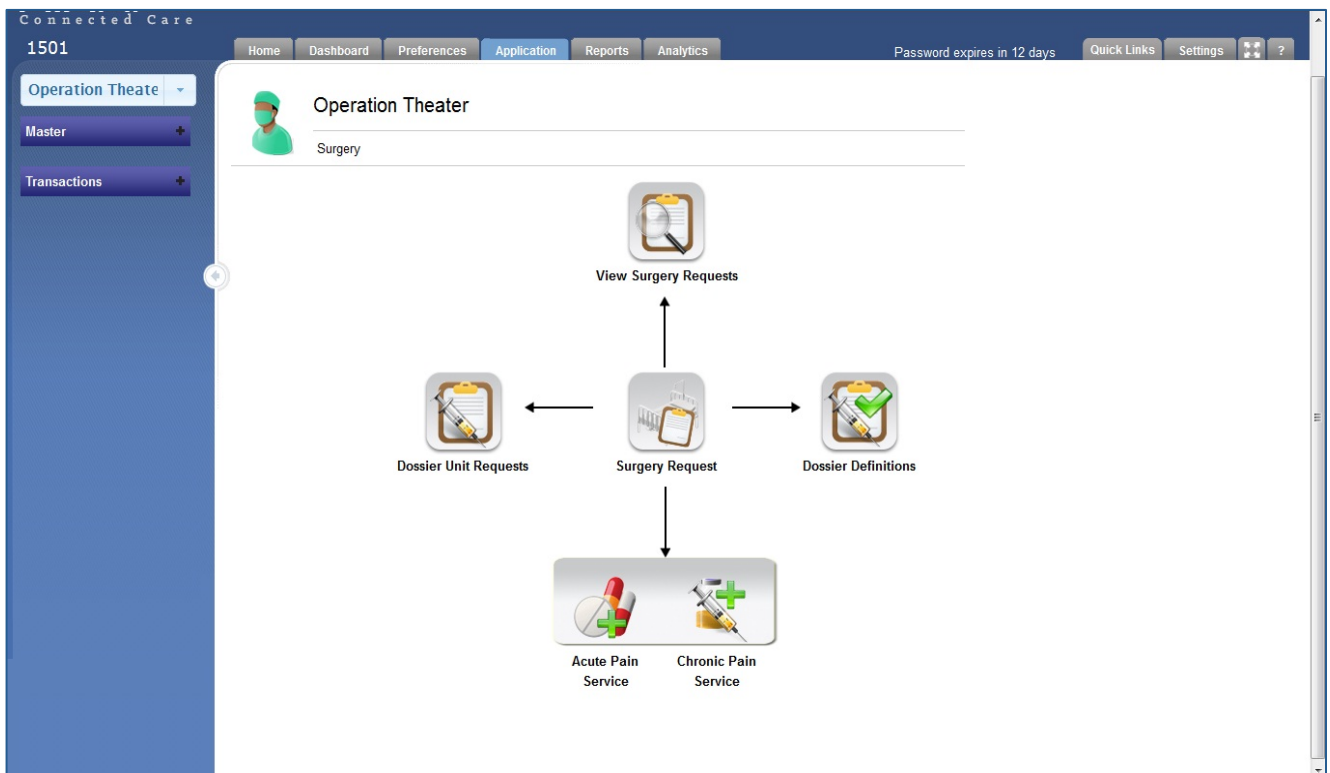
Generates comprehensive reports on various customizable parameters. The MIS Reports module facilitates On-line Queries and generation of highly useful information needed daily, monthly and annually by management of the hospital.

The business intelligence tools predict and forecast business and ensure that various reporting techniques and functions are available for unparalleled flexibility & scalability through intuitive visuals and interactive graphics that simplify complex data.

Project: OT Scheduling through HMIS



HINAI Home Page



HINAI OT Module

Project: OT Scheduling through HMIS

Operation Theater

Surgery Request

View All

Request No. (Auto Gen)

Request Priority

Chief Surgeon *

Surgery Type*

Elective

-- Select --

-- Select --

Request Date*

Request Sequence Number

Anesthetist

Billing Class

30/05/2016 11:56

3

-- Select --

-- Select --

Procedures to be Performed

Department

Procedures Code/Name For

Add

Code	Procedure Name	IsPrimaryProcedure	Tariff	Remarks	Action
------	----------------	--------------------	--------	---------	--------

Operation Schedule

Operation Team

Nursing Instructions

Operation Date *

Operation Time

Operation Room

Duration Hrs.

Dossier Name

Store Name

Resident Instruction

Remarks

Total Surgery Amount

0.00

Request

Back

HINAI Surgery Request Page

hinAI WEB

Connected Care

1501

Home

Dashboard

Preferences

Application

Reports

Analytics

Welcome Mr. SUDHAK. (0) Logout

(NH-Jaipur ...ACCIDENT & ...ACCIDENT & ...)(change)

Password expires in 12 days

Quick Links

Settings

?

Operation Theater

Surgery Request Browser

Excel

Place New Surgery Request

MRN

Requested By

Requesting Department

Scheduled From Date

Request No

Patient Name

Requested Date

Treating Consultant

Scheduled To Date

Status

PAC Status

Pending

Validated

Cleared

To be resolved

Search

1

2

3

4

HINAI Surgery Request Browser

Dr. Anirban Kundu

CLEARANCES, INVESTIGATION AND CONSENT

PAC

Once the OT Booking is done, Anesthetist should make sure that the PAC is done one day prior to the surgery of all the booked cases. Moreover the resident doctor should make sure one day prior to the surgery that PAC is done.

FINANCIAL CLEARANCE

- OT booking should be done after getting the approval from the Finance Department only.
- In case there is change in care plan, Doctor is supposed to inform the patient in case of TPA, so that the TPA could be informed for the change in care plan on time otherwise, strict action should be taken from management for the defaulters.
- For timely TPA/Finance approval, investigation should be send to TPA on time. Nurses should send investigation samples to lab, for getting reports on time.

PREHOLD AREA

Nursing from OT Complex is responsible for transfer of patients from wards to Ots.

TO AVOID CANCELLATION OF CASES

Following are the suggestions made to avoid cancellation of cases

- Charge some booking amount at the time of booking
- Advice investigations in the OPD itself

LIMITATIONS

- **From Patient's End:**

There are many factors from the patient's end that cannot be controlled for avoiding the problems as delays, cancellation or postponements as:

1. Late arrival of patient despite patient education and counseling
2. Non-submission of documents on time leading to late approval
3. Change in decision for having surgery

- **Resistance To Change:**

1. As the Nursing and other staff are not very much tech-savvy, it will be difficult for them to acclimatize to OT-HMIS Module.
2. The Staff are habitual to work according to their own convenience, therefore, adherence to protocol such as booking OT on time, on-time starts, being punctual would be difficult.

CONCLUSION

As healthcare workers we have to believe that our main responsibility is to maintain our accountability and to deal with issues with a professional point of view. This project enriched my portfolio with a success story based on determination, understanding and implementing change where change is needed.

Describing my project it is very important to conclude its significance for me as a manager in a new role, understanding all contributing factors, exchanging ideas with people, learning new strategies and failing at times. Tackling such an important area as the OT was an important decision and a challenging job since it is well known that OT's are the money generating areas in any private healthcare institutions. Recommendations given into this area will not only improve the OT efficiency, but quality of care in general will be improved by raising the bar for better practice and enhanced communication.

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