

A Report on

**Utilization Rate and Turnaround Time Analysis of
OT and Cath-Lab Complexes**

Kokilaben Dhirubhai Ambani Hospital and Research Centre
Mumbai

April & May, 2015

Chaitanya Dadhich
19th MBA-HM
IIHMR University, Jaipur

CERTIFICATE

This is to certify that the project work titled ' Utilization rate and turnaround time analysis of OT and Cath-Lab Complexes' has been done entirely and submitted by Mr. Chaitanya Dadhich, a student of Masters of Business Administration in Hospital and Health Management-19th Batch from IIHMR University, Jaipur.

The study project was prepared during the internship period from April 07th 2015 – May 31st, 2015 at Kokilaben Dhirubhai Ambani Hospital, Mumbai. This is his original work.

I wish him all success for his future endeavors.



Col. (Dr) Ashok Kaushik

Dean (Academics & Student Affairs)

IIHMR University, Jaipur



Dr. Susmit Jain

Assistant Professor

IIHMR University, Jaipur

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Mr. Chaitanya Dadhich** has worked as an intern in Kokilaben Dhirubhai Ambani Hospital from 6th April, 2015 to 31st May, 2015.

During his tenure as an intern he has worked on the following case studies:

1. Study on Turnaround time and Utilization rate of Operation theatres in KDAH.
2. Study on Turnaround time and utilization rate of CATH labs in KDAH.

I wish him best of luck for his future endeavor.

Regards,

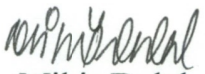

Dr. Mihir Dalal
Deputy General Manager
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ACKNOWLEDGEMENTS:

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

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

I consider myself fortunate for having been provided an opportunity to undergo summer training at Kokilaben Dhirubhai Ambani Hospital, Mumbai and wish to express my indebted gratitude to Dr. Ram Narain, CEO KDH, Dr. Mihir Dalal Senior Clinical Manager.

I also wish to extend a special thanks to Dr. Amit Marathe, OT Manager who in spite of being extremely busy with his duties, took time to hear, guide and keep me on the correct path and allowing me to carry out my project work at their esteemed organization during the training.

I take this opportunity to express my profound gratitude and keep regards to my Mentor, Dr. Ram Pandey, (Clinical Administration) for his guidance and constant encouragement during the course of project.

I am thankful to Dr. Arun Mishra, Dolly Midda, Prateksha Pal and Dr. Havoi Fauzdar for the valuable information provided by them in their respective fields. I am grateful for the co-operation of all the staff at Kokilaben Dhirubhai Ambani Hospital during the period of my project.

Chaitanya Dadhich

THE INSTITUTION

Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute is India's newest, most advanced tertiary care facility. As the flagship social initiative of Anil Dhirubhai Ambani group, it is designed to raise India's global standing as a healthcare hub, with emphasis on excellence in clinical services, diagnostic facilities and research.

A vision to strengthen healthcare in the communities KDA Hospital serves and empower patients to make informed choices. Inaugurated in January 2009, The Hospital is a significant CSR initiative from Reliance Anil Dhirubhai Ambani Group. It is the only hospital in Mumbai to function with a FULL TIME SPECIALIST SYSTEM that ensures the availability and access to the best medical talent around-the-clock. The 750-bed hospital has over 103 full-time doctors, 520 nurses and about 200 paramedical and is growing every day.

It represents a confluence of top-notch talent, cutting edge technology, state of art infrastructure and most important, commitment. KDAH offers doctors and patient's cutting edge diagnostic and surgical solutions as well as the latest IT systems. In many cases, they represent the first of their kind in the region.

KDAH is fully geared in terms of talent, technology, structure and spirit-to reshape perceptions regarding hospitals and redefine the concept of caring. Indeed, this globally benchmarked institution marks the beginning of a new era in Indian healthcare.

HISTORY

The hospital project was initiated in 1999 by Dr. Nitu Mandke as a large scale heart hospital. Dr. Nitu Mandke was born in 1948 in a middle class family. He was first in the family to choose medicine as a profession with a determination to become a heart surgeon.

He joined B.J. Medical College; Pune from where he passed his M.B.B.S in 1970 came to Mumbai for further studies and completed his super specialty course in Cardiovascular Surgery. He spent close to 8 years working with world renowned figures in cardiac surgery like Dr. Magdi Yacoub in England and Dr. Kirklin and Dr. Pacifico at the University of Alabama in the United states. He was an all-rounder with exemplary proficiency in sports, arts, languages, mathematics and many more.

In his lifetime he won the heart of many and repaired many more through unerring surgery. He won various social awards like : The Rajiv Gandhi Gold Medal of Merit 1992, Indira Gandhi Sadhbhawna Award 1999, Outstanding Man of the 20th Century 2000, Pride of India 2001, Sarvashri Gold Medal 2000 and Maharashtra Gaurav Award to name a few.

With great passion Dr. Mandke built a substantial portion of the hospital building. Sadly his dream was cut short by fate when he succumbed to a massive heart attack in May 2003 ; leaving a dream unfulfilled and unfinished.

The Management of Mandke Foundation approached Reliance ADA Group, who graciously took over this project and developed it into one of the most modern and state of art multispecialty tertiary care hospital; naming the institution as – Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute.

In honour of the initiator, the hospital's Medical Convention Centre has been aptly dedicated to the memory of Dr. Nitu Mandke.

VISION

We aim to be a global healthcare institution that combines the best in medical treatment with strong ethical principles and a culture of care and compassion.

VALUES

Integrity: To deal with all stakeholders – patients, partners, employees, vendors and the community – in the spirit of fairness and integrity

Transparency: To respect the patient's right to know at every touch point by providing information that is clear, concise, relevant and easy to understand.

Maximum Care: To re-evaluate every hospital system, process and procedure to ensure that patients and their loved ones receive maximum care and comfort.

Self - Improvement: To instill a process of learning and self - improvement at every level through continuous training, focused research and peer review.

Patient Dignity: To safeguard the dignity of patients by protecting their individuality and privacy at all times.

KEY STATISTICS

Encompassing ten lakh square feet of space spread over 17 floors and two basements. Its intelligent framework allows for hospital staff to optimize utilization of space and resources.

Accommodates over 750 inpatient beds, allows optimal utilization of resources and ensures privacy, dignity, comfort, convenience and the best healthcare to every patient with smooth and seamless movement of people & staff guaranteed.

Critical care unit has the largest number of critical care beds in Mumbai, with 130 ICU beds. Special technical features in ICU including ceiling mounted, dual arm pendants which ensure that the space around the patient is not cluttered. Another unique feature is dedicated air supply that keeps the critical care free of any kind of contamination and infection.

It has a total of over 140 Full time consulting clinics, with the capacity to handle over 6000 outpatient consulting every day.

Movements in the hospital is managed by 30 elevators – the largest elevator bank for any hospital in India capable of transporting 7500 persons per hour, with different elevators for inpatients, outpatients, staff and other services.

Two dedicated elevators ensure quick transfer of patients to operation Rooms and ICUs.

The hospital's laboratory is housed on a single floor spread over an area of over 40,000 square feet offers over 3000 routine and highly advanced diagnostics, genetic and molecular biology test.

UNIQUE IN MUMBAI

- ✓ Mumbai's first slice PET CT Scanner that combines computed tomography and positron emission tomography technologies into a single machine.
- ✓ 140 ICU beds, largest number of critical care beds in Mumbai.

- ✓ Hospital's laboratory housed on single floor, spread over an area of over 40,000 sq ft offers over 3,000 routine and highly advanced diagnostics, genetic and molecular biology tests.
- ✓ Mumbai's Largest OT complex with 22 operating theatres.
- ✓ Largest dialysis Centre in Mumbai.
- ✓ Full-time Specialist System: All doctors are attached and available only at Kokilaben Hospital.
- ✓ Level I Accident and Emergency Center.

UNIQUE IN INDIA

- ✓ Encompassing 10 lakh sqft of space spread over 17 floors and two basements. Its "intelligent framework" allows for hospital staff to optimize utilization of space and resources.
- ✓ Accommodates over 750 in-patient beds, allows optimal utilization of resources and ensures privacy, dignity, comfort, convenience and the best health care to every patient. However the smooth and seamless movement of people & staff guaranteed.
- ✓ Critical care unit has the largest number of critical care beds in Mumbai, with 130 ICU beds. Special technical features in ICU including ceiling mounted, dual arm pendants which ensure that the space around the patient is not cluttered. Another unique feature is dedicated air supply that keeps the critical care free of any kind of contamination and infection.
- ✓ It has a total of over 140 Full time consulting clinics, with the capacity to handle over 6000 outpatient consulting every day.
- ✓ Movements in the hospital is managed by 30 elevators – the largest elevator bank for any hospital in India capable of transporting 7500 persons per hour, with different elevators for inpatients , outpatients, staff and catering.
- ✓ Two dedicated elevators ensure quick transfer of patients to operation Rooms and ICUs.
- ✓ The hospital's laboratory is housed on a single floor spread over an area of over 40,000 sqft offers over 3,000 routine and highly advanced diagnostics, genetic and molecular biology test and will serve as a referral Centre for second opinions.

HOSPITAL INFRASTRUCTURE

a) Lower basement

- Biomedical Engineering
- CSSD
- MRD
- Nuclear medicine
- PET CT
- Radiation Oncology
- SRS

b) Upper basement

- Car Parking
- Central security office
- Mortuary

c) Ground floor

- Main Reception
- Admission counter
- Discharge and billing
- Pharmacy & Medical mall
- Gift shop
- Prayer hall
- Business centre
- Fine dining
- Food court
- ATM
- Central report collection centre
- Beauty Salon
- Accident and emergency

d) Mezzanine Floor

- Administration
- Library
- Staff dining

e) First Floor

- Clinical administration
- Radiology & Imaging (X-Ray, MRI , Ultrasound, CT scan)
- Health check-up program
- Sample collection
- Centre for cardiac sciences
- Centre for bone and joint
- Centre for pulmonary and lung medicine
- Multi-specialty OPD

f) Second floor

- Centre for children
- Centre for brain and nervous centre
- Dental clinic
- Centre for cancer
- Ophthalmology clinic
- E.N.T clinic
- Gastroenterology clinic
- Dialysis centre
- Blood bank
- Urology clinic
- Nephrology clinic

g) Third floor

- OT complex 1 (8 theatres)
- Catheterization lab
- ICU (Neurology and Surgical)
- Interventional Radiology

h) Fourth floor

- IT Servers and Systems

i) Fifth floor

- Ambulatory surgery
- Day surgery
- ICU (cardiac)
- OT complex 2 (7 theatre)
- Refuge Area

j) Sixth floor

- Rehabilitation centre
- Convention and exhibition centre

k) Seventh floor

- IVF centre
- Cosmetology and aesthetic surgery
- Laboratory medicine and pathology
- Nursing College
- Tissue and bone bank

l) Eighth floor

- Birthing complex (labour and delivery)
- ICU (paediatric and neonatal)
- Birthing Suites
- OT (obstetric)
- Wards

m) Ninth floor

- Inpatients (paediatric and orthopaedic)

n) Tenth floor

- High dependency unit
- ICU (Medical)
- Refuge area

o) Eleventh floor

- General ward

p) Twelfth to sixteenth floor - Inpatient

DEPARTMENTS IN THE HOSPITAL

The following departments function in the hospital

Clinical Services	Clinical support services	Utility Services	Administrative services
Accident and Emergency	Laboratory	Ambulance services	Human resource Management
Outpatient Department	Imaging	Dietary Services	Material Management
Operation Theatre	Physical Medicine and Rehabilitation	Security	Marketing
Indoor Patient Department	Biomedical waste	Laundry and Linen	Financial Management
Intensive Care Unit	Medical Records	Housekeeping	Engineering Services
Nursing department	Pharmacy	Call Centre	IT Management
Dialysis	Blood Bank		Medical Social Work
	CSSD		
	Mortuary		

CLINICAL SERVICES

ACCIDENT AND EMERGENCY

An Emergency Department (ED) is also known as Accident & Emergency (A & E), Emergency Room (ER), Emergency Ward (EW), or Casualty Department is a medical treatment facility, specializing in acute care of patients who present without prior appointment, either by their own means or by ambulance. Due to the unplanned nature of patient attendance, the department must

provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life threatening and require immediate attention.

Layout

- 11 bedded (6+3 triage + 2 isolation)
- Each bed is separated with curtains to maintain patient privacy and is equipped with the following:
 1. Oxygen supply
 2. Suction Pump
 3. Syringe pump
 4. Cardiac monitor

Minor Operation theatre

- Machines in minor OT are as follows:
 1. Anesthesia machine
 2. ETCO2 machine
 3. Cautery machine
 4. OT table
- Procedures done in minor OT
 1. Lumbar puncture
 2. Biopsy
 3. Bone marrow aspiration
 4. Suturing

Staff:

Head of Department

9 Junior Medical Doctor (2 per shift)

1 Head Nurse

24 Staff nurse (6 per shift)

6 HCA (2 per shift)

Equipment:

- Defibrillator - 2
- Portable ECG - 2
- Nebulisation machine -2
- Portable sonography machine -1
- Trolleys :
 - ✓ Procedure trolley
 - ✓ Induction trolley
 - ✓ Adult crash cart
 - ✓ Dressing trolley

Ambulance:

There are 2 types of ambulance:

- a) Non-cardiac ambulance
- b) Cardiac Ambulance

Equipment's in the ambulance are as follows:

- Ambulance cot
- Portable Ventilator (cardiac ambulance)
- Portable oxygen unit
- Portable suction unit
- First aid kits
- Traction splint
- Auxiliary Stretcher
- Transfer sheet
- Airways (nasal, oropharyngeal)
- Obstetrical Kit
- Sphygmomanometer

- Stethoscope
- Fire Extinguishers
- Burn Kit
- Others
 - ✓ Sterile and non-sterile gloves
 - ✓ Face mask
 - ✓ Blankets
 - ✓ Towels
 - ✓ Bed pan
 - ✓ Tongue depressors
 - ✓ Cold packs instant chemical type

Staff:

- 1 HCA in non-cardiac ambulance
- 1 HCA + 1 nurse + 1 cardiac consultant in cardiac ambulance

OUTPATIENT DEPARTMENT

Kokilaben Dhirubhai Ambani Hospital has 140 independent consultant clinics with a capacity to handle over 6000 outpatient consultations every day. These clinics are organised as “functional clusters” representing a specialty, with each cluster containing its own examination room, phlebotomy room, and in instances, rooms for specialized medical equipment unique to the cluster. A day care dialysis unit, an endoscopy theatre complex, radiology suites and a blood bank support outpatient service are co-located on the same floors as the self-contained outpatient area. The hospital outpatient services offer specialist consultation services across 42 different specialties including six centers of excellence.

The six centre of excellence are as follows:

- Centre for neurosciences
- Centre for cancer
- Centre for physical medicine and rehabilitation
- Centre for cardiac sciences
- Centre for bone and joint

- Centre for children

The specialists included are Anesthesiology, Critical Care Medicine, accident and emergency, gynecology and obstetrics, imaging, laboratory medicine and pathology including biochemistry, molecular biology, hematology, histopathology, microbiology, clinical pathology, transfusion medicine and blood bank, genetics, tissue and bone bank, dermatology, endocrinology, gastroenterology, clinical nutrition, internal medicine, nephrology, psychiatry, pulmonary medicine, rheumatology, geriatric medicine, surgery including dentistry, ENT, general surgery, ophthalmology, plastic and reconstructive surgery, urology, surgical oncology, cosmetology.

a) Access to OPD services:

All patients who visit KDAH or free OPD for the first time for consultation/ other services are issued a card which gives each patient a UHID number. This UHID card is attached to the registration form. With the help of this number, medical records of patients can be assessed. Allotment and control of UHID number is the responsibility of the admission staff desk.

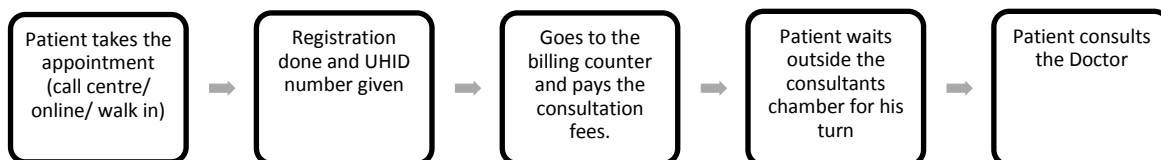
b) OPD Appointment:

Appointments can be fixed over telephone to all from the call centre or personally across the reception counter. Fax and e-mail facilities are also available.

c) OPD Tariff:

The OPD consultation fees is Rs. 1000 which is valid for 48 hours and for each subsequent visit within one month the patient has to pay Rs. 700. OPD consultation fees for premium doctors is Rs. 2000 valid for 48 hours and Rs. 1500 for all subsequent visits within one month.

d) Process Flow:



Following services are offered in the OPD:

- Medical / Surgical consultations
- Preventive Health check-up packages
- Laboratory investigations
- Imaging services
- Cardiology investigations
- Neurology investigations
- Pulmonary investigations
- Pain management
- AKD
- Gamma knife
- Endoscopy
- Bronchoscopy
- Urodynamic study
- Physiotherapy
- CDC
- ENT
- Ophthalmology
- Dental procedures
- Oncology
- Radiation oncology

HEALTH CHECK UP

- The executive check-up department, a part of OPD services, is a wing of this multispecialty hospital dedicated to the diagnostic and preventive side of patient care. It is a place where healthy patients come for prognosis of disease or to know about the preventive and curative aspect of conditions they may already have.

- This system facilitates the patient to get all the required investigations/consultations done without having to pay for either consultation and/or for each individual item of pathological or imaging investigation. It is the centre point where the potential customers come directly in contact with hospital services. This department can therefore be a point to draw in patients to become in-patients or for them to come even for follow up OPD consultation.
- The packages in the program have been developed by a team of highly qualified and experienced medical personnel and are designed to offer a complete medical check-up and within their limitations detect any latent health problems. In additions, these packages are offered at special discounted rates that make them truly worthwhile. At the end of the day, candidates leave the hospital with all their reports.
- This department is dependent on various other hospital departments and consultants to ensure a smooth process flow. Therefore co-ordination is a key factor in smoothly running the department. The departments in co-ordination are: pathology, radiology, cardiology, ENT, ophthalmology, dental etc. the visiting consultants are from following department: medicine, surgery and gynecology.

OPERATION THEATRES

Operation theatres are mission-critical assets to all tertiary care hospitals as they contribute to almost two-thirds of hospital's total revenues. Moreover, OTs also account for about 40% of the hospital's total expenses including manpower costs, capital cost, the fixed and variable operating costs of the surgical facility. This makes it imperative that the functioning of the operation theatres is optimized. The business model of private hospitals is such that it generates earnings only when the OTs are fully utilized. Utilization Rate is therefore a simple and adequate measure of efficiency of Operation Theatre because its ability to generate revenue rises proportionately with the time for which it is used.

Improving efficiency of OT major undertaking due to the inherent complexity of the processes involved. This complexity can be attributed to several factors.

First, scheduling patients for surgery in a way that reduces clashes with other patients and boosts optimal utilization of the OT's resources (such as surgical team, nurses, technicians etc) is a complex problem. At this stage, decisions such as sequencing of patient arrivals, allocation of patients to ORs, and matching of patients with surgical teams need to be made meticulously.

Second, OTs are usually part of a surgical suite where they share common resources required in both reception of arriving patients and post-surgery recovery of patients. In the discharge of post-operative

patients, ICU beds are a vital resource which is unfortunately prone to much uncertainty due to their multiple users. Therefore managing the patient traffic through a surgical suite requires a holistic approach with account of both upstream and downstream process requirements.

Third, there is significant uncertainty in several activities involved in the delivery of surgical care, such as the uncertainty related to arrival times of patients, OT personnel availability, duration of the surgical procedure, etc. Inevitably, this makes advanced planning of OT utilization very difficult.

CATH LABS

Cath Labs are an essential part of any tertiary care hospital. They are capable of performing both diagnostic and procedural services such as angiography, angioplasty, stent insertion, pacemaker insertion /removal etc. Cath lab procedures are usually short often lasting just 15-30 minutes, however, patients must be kept under observation for 4-8 hours depending on the type of procedure and the condition of the patient. Increasing the efficiency of the Cath Lab would directly lead to greater revenues as the procedures involve limited manpower and consumables while providing high revenues per unit.

This study sought to examine the process and measure the efficiency of 15 OTs in two OT Complexes and two CATH labs. The Turnaround Times (TATs) and Utilization Rates (URs) of all OTs and Cath labs were individually calculated from the time period of 24th April till 16th May.

Similar study was carried out in the Cathlab complex which had two functioning Cathlabs.

OBJECTIVES:

- To Calculate the turnaround time of each Operation Theatre and CATH lab
- To Calculate the Utilization Rate of each Operation Theatre and CATH lab
- To suggest solutions to increase the efficiency of Operation theatres and CATH labs

RESEARCH METHODOLOGY:

Study Location: OT complex 1 ,OT complex 2 ,CATH-Lab 2 and 3 in Kokilaben Dhirubhai Ambani Hospital, Mumbai

Study Period: 24th April to 16th May

Study Design:

The study was a descriptive, cross-sectional study. All cases during the respective study periods were recorded. Part of the data was collected retrospectively from log books and the hospital MIS.

Study Area	Duration of Data Collection	No. of Cases Collected
5 th Floor OT Complex	24 th April – 6 th May	240
3 rd Floor OT Complex	2 nd May – 13 th May	150
Cath-Lab Complex	2 nd May – 16 th May	153

Sampling:

Instead of drawing a representative sample from retrospective data, the entire population in the study period was taken into the study in order to ascertain the reasons for delays and analyze the most frequent and most time-consuming reasons in real time.

<OT Distribution tables here>

OT 1	Neurosurgery
OT 2	Neurosurgery
OT 3	Paediatric Cardiac
OT 4	Adult Cardiac
OT 5	Ortho & Spine
OT 6	Paediatric Cardiac
OT 7	General
OT 8	Ortho & Spine

Fig1:OT Complex 1 (3rd Floor)

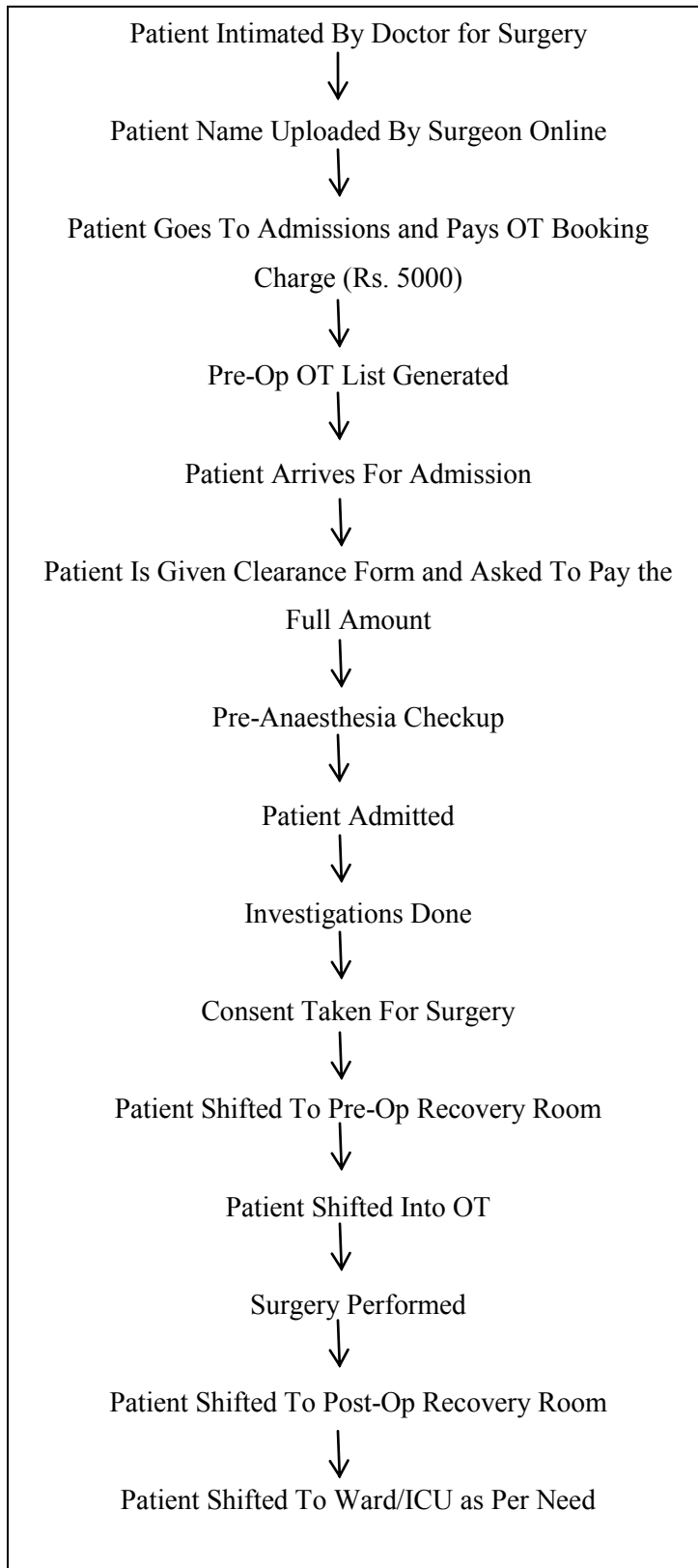
OT 1	ENT & Ophthalmology
OT 2	Urology
OT 3	Urology + General
OT 4	Urology + General
OT 5	General Robotic
OT 6	Ortho & Transplants
OT 7	Transplants

Fig 2:OT Complex 2 (5th Floor)

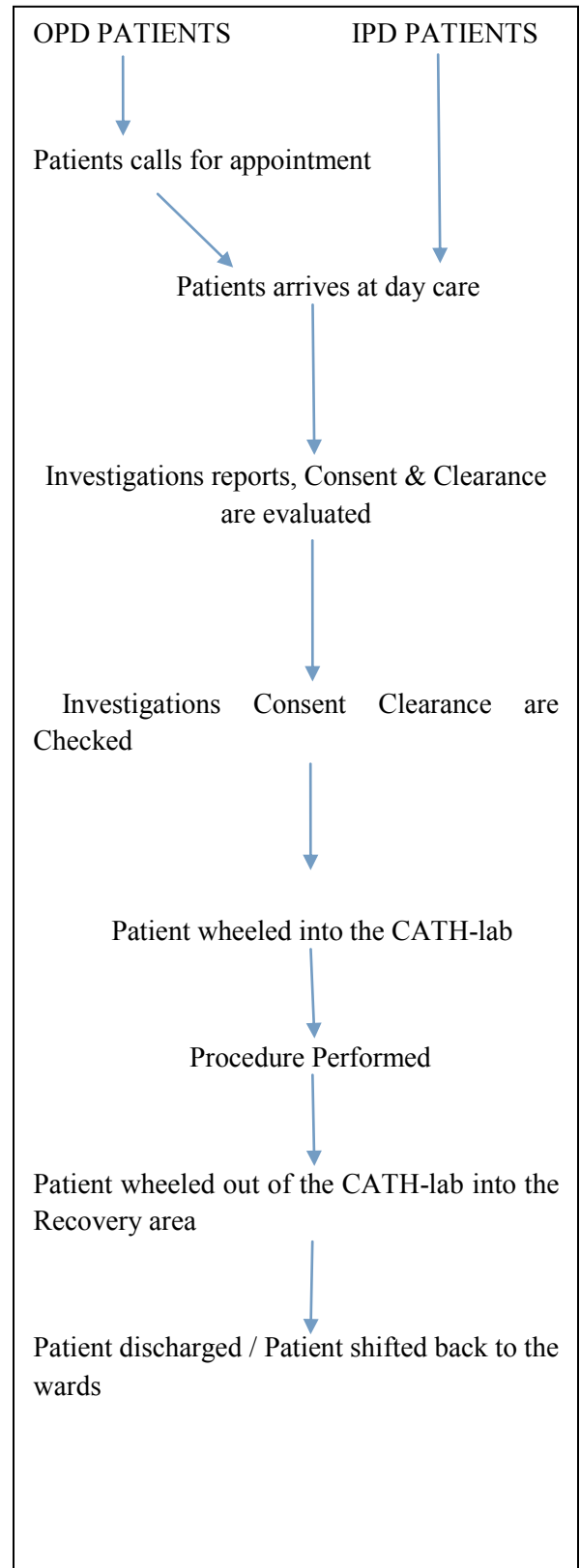
DATA COLLECTION & PROCESS FLOW:

The process flow in the OTs and Cathlab is represented in the diagrams below.

OPERATION THEATRES



CATH-LAB



The data points collected for analysis were:

- Arrival in the pre-operative recovery room
- Patient entry into the OT
- Incision time
- Patient exit from OT

Data was collected by observation in the OT complexes and the Cath-Lab during the study period. Data was entered into a printed form and later entered into MS Excel for further analysis.

DATA ANALYSIS:

The data collected was used to calculate the following factors:

- Turnaround Time
- Utilization Rate
- Delay Percentage

Turnaround Time: The time between one patient leaving the OT/Cath-Lab and the next patient entering. The median of the Turnaround Times of all cases in a particular OT was calculated to reflect the true average TAT for that OT (due to the presence of extreme values).

Note: Median TAT is taken instead of the Average TAT as there was wide variations in the TAT times on specific days in all the OTs. Hence Median TAT would give a closer estimated result to than the Average TAT.

Utilization Rate: This is the number of productive minutes per 12-hour period. Normally cases are scheduled from 8 AM to 8 PM, so a 12 hour period (720 minutes) was considered. Productive time is that period of time in which the OT was productive – i.e. surgical time and time taken to prepare the OT for the next case.

Down Time: Period of time when the Operation theatre is not used

Working Duration = total no. of minutes that the OT was functioning – i.e. 8:00 AM to OT Closing

Wastage = Actual Down Time – Expected Down Time

Actual Down Time = Sum of all TATs + Delay in starting the first case of the day

Expected Down Time = (Median TAT for that OT) × (N-1)

N = number of surgeries performed in that OT on that day

Utilization Rates of a given OT were calculated on every day in the study and their mean was considered the Average Utilization Rate for that OT.

Delay Percentage: The percentage of cases that were delayed beyond 30 minutes.

CALCULATIONS:

Utilization Rate (Example) On the 29th of April, OT 7 on the 5th floor OT Complex had the following situation:

No. of Surgeries performed = 4
Working Duration = 745 min (OT closed at 8:25 PM)
Expected Down Time = $35.5 \times 3 = 106.5$ min
Actual Down Time = 223 min
Wastage = $218 - 106.5 = 116.5$ min

From the above data,

The Utilization Rate of OT 7 (5th floor) on 29th April was 87.29%

RESULTS:

Turnaround Times:

Table 1 – Median TATs in OT Complex 2 (5th Floor)

OT No.	Time	Reasons
OT 1	16 minutes	Opthal cases ,Small cases less TAT
OT 2	25 minutes	Urology cases with expected TAT
OT 3	35 minutes	Urology and general cases with irregular scheduling of minor cases.
OT 4	43 minutes	Different surgeons varied time allotted to patients
OT 5	35 minutes	Robotic cases and general cases with relative TAT
OT 6	72.5 minutes	Long scheduled ortho and transplant cases, cases getting over early with next case scheduled not ready
OT 7	35.5 minutes	Mostly single cases, less cases ,less scheduling, less variation in TAT

Table 2 – Median TATs in OT Complex 1 (3rd Floor)

OT 1	65 minutes
OT 3	60 minutes
OT 4	51.5 minutes
OT 5	37.5 minutes
OT 6	35 minutes
OT 7	39 minutes
OT 8	41.5 minutes

TAT for OT 2 on the 3rd floor was not calculated as it rarely had more than one case per day, so there was no possibility of measuring Turnaround Time.

Note: The TAT of OT complex 2 on the 3rd floor has wide variation in TAT as the cases scheduled are mostly long cases and cases scheduled per OT is generally one, hence any case scheduled after that are additional cases hence a wide variation in turn over times.

Table 3 – Median TATs in Cathlab Complex

Cathlab 2	17.5 minutes
Cathlab 3	12.5 minutes

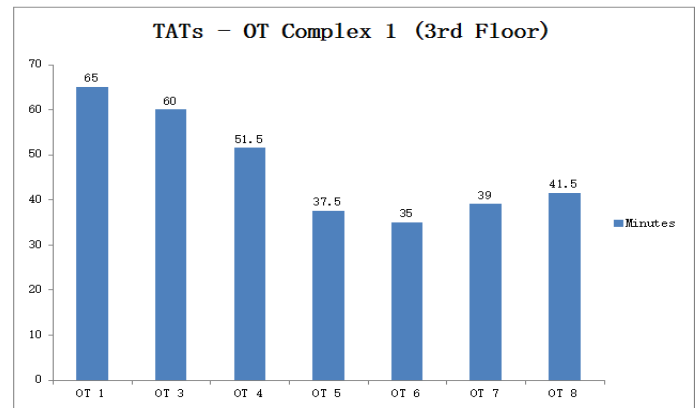
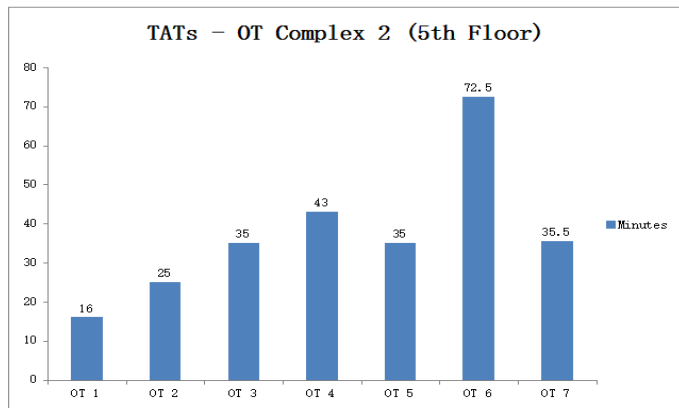


Fig 1: Comparative Analysis of the Turn Around times of Operation Theatres

Utilization Rates:

Table 4 – Average URs in OT Complex 2 (5th Floor)

OT 1	69.15%	Small cases, scheduling of cases less as compared to the no of working hours.
OT 2	86.68%	More no of cases scheduled under same surgeon
OT 3	82.75%	More urology and general cases scheduled
OT 4	86.15%	More no of cases scheduled
OT 5	84.38%	Robotic cases fixed time and fixed no of cases
OT 6	76.57%	Ortho and transplant cases variable time duration
OT 7	83.69%	Single cases long duration most of the days

Table 5 – Average URs in OT Complex 1 (3rd Floor)

OT 1	57.16%
OT 2	49.30%
OT 3	72.54%
OT 4	78.01%
OT 5	78.55%
OT 6	64.90%
OT 7	63.94%
OT 8	83.64%

Note: Utilization rates of all the OT's on the third floor are comparatively low due to the length and no of cases scheduled. Generally 1- 2 cases are scheduled per day with variable duration of surgery usually ending much before the allotted time duration ,thereby reducing the utilization . OT 8 on the 3rd floor is utilized better as compared to the rest of the OT's due to more no of cases scheduled under the same surgeon.

Table 5 – Average URs in Cathlab Complex

Cathlab 2	48.63%
Cathlab 3	55.71%

Note: The utilization rates of the CATH-labs are relatively low due to less no of cases available and the working duration being higher than required.

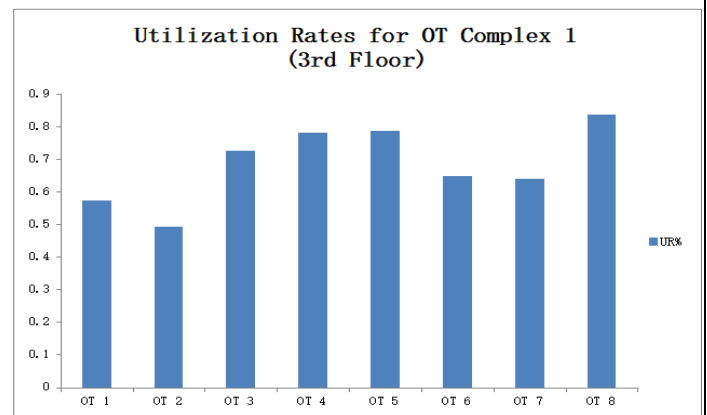
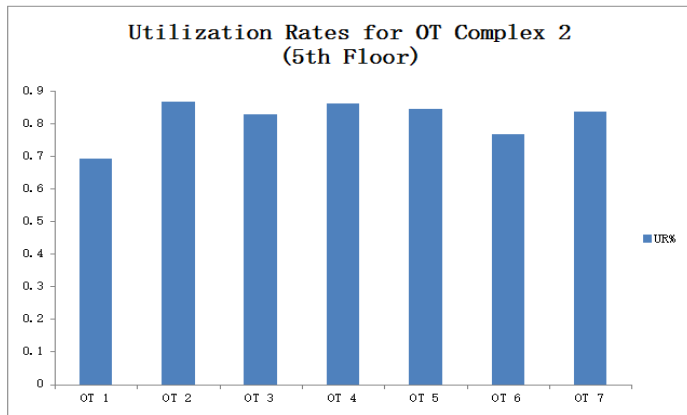


Fig 2: Comparative Analysis of Utilization Rate of Operation Theatres

RECOMMENDATIONS:

Operation Theatres

- As cases on 5th floor are shorter and less complex, some cases could be shifted to the 3rd floor OT complex to improve utilization by scheduling these cases after the long case.
- Both floors have some cases which are very short (less than an hour long) such as dental procedures, pain management, plaster and dressing change, bed sore removal etc. These cases could be performed in a minor OT or a procedure room instead of taking up time in the main OTs. Delays in clearances and investigations for these procedures lead to delays in the major cases as well.
- Patients must be instructed to get admitted the previous day (after 12 noon) or risk losing the OT booking. This must be enforced to eliminate delays due to pending investigations, anaesthetist clearance, cardiac clearance, consent etc.
- OT Booking amount should be made mandatory and should be a substantial amount (20-25% of clearance amount). This would act as an economic disincentive for cancelling the booking due to non-medical reasons.
- Patients must be provided a checklist of things to be done before they can undergo surgery (investigations to be done, clearances from other consultants, forms to be signed etc). This would make the patient/attendants focus and co-operate with the staff to prepare themselves for the surgery on time.
- Pending investigations could be done on an OPD basis for non TPA patients.

Cath-Labs

- In order to reduce the delays in Cathlabs, walk-in patients must be provided with a checklist of tests to be brought on the day of procedure. This must be provided at the time of booking the appointment. This will help ensure that patients bring up-to-date test-reports or get the investigations done before they arrive at the day care. Alternately, appointments should not be given unless the patient has had a consultation with a cardiologist at KDAH.
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