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

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INTRODUCTION

Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute is India's newest, most advanced tertiary care facility. Located in Mumbai, it is the flagship social initiative of the Anil Dhirubhai Ambani Group.

It is the only hospital in Mumbai to function with a FULL TIME SPECIALIST SYSTEM that ensures 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.

Operation Theatres and Cath-Labs are both massive cost-centres as well as mission-critical revenue centers of the hospital. Therefore, it is crucial to ensure optimum resource utilization and maximum productive output.

OBJECTIVES

• To Calculate the turnaround time of each Operation Theatre and CATH lab in Kokilaben Dhirubhai Ambani Hospital.

• To Calculate the Utilization Rate of each Operation Theatre and CATH lab in Kokilaben Dhirubhai Ambani Hospital.

• To identify the reasons behind increased Turnaround time and reduced Utilization rate of Operation theatres and CATH labs.

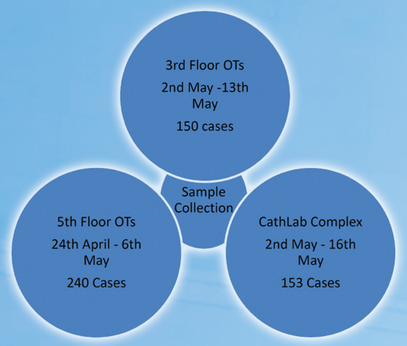
• To suggest solutions to increase the efficiency of Operation theatres and CATH labs in Kokilaben Dhirubhai Ambani Hospital.

METHODOLOGY

STUDY DESIGN

A descriptive, cross-sectional, non-interventional study was done.

SAMPLING



5th Floor OT Complex

OT Number	Type of Procedures Generally Done
OT 1	ENT & Ophthal Procedures
OT 2	Urology
OT 3	Urology + General
OT 4	Urology + General
OT 5	Urology + General (Robotic)
OT 6	Transplants + General
OT 7	Transplants + General

3rd Floor OT Complex

OT Number	Type of Procedures Generally Done
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

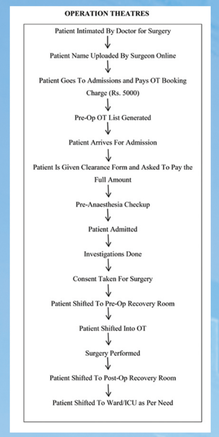
DATA ANALYSIS

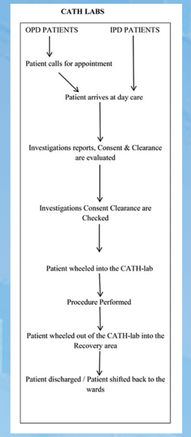
Turnaround Time: The time between one patient leaving the OT/Cath-Lab and the next patient entering.

Utilization Rate: This is the percentage of productive minutes per 12-hour period. (8 AM - 8 PM)

$$UR = \frac{Working\ Duration - Wastage}{720} \times 100$$

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





UTILIZATION RATE CALCULATION

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 that day + Delay in starting the first case of the day

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

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

RESULTS - TURNAROUND TIMES

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

OT 1	16 minutes
OT 2	25 minutes
OT 3	35 minutes
OT 4	43 minutes
OT 5	35 minutes
OT 6	72.5 minutes
OT 7	35.5 minutes

Average: 37.43 Minutes

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

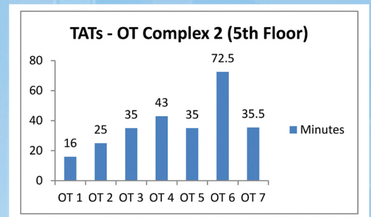
OT 1	65 minutes
OT 3	60 minutes
OT 4	51.5 minutes
OT 5	37.5 minutes
OT 6	35 minutes
OT 7	39 minutes
OT 8	41.5 minutes

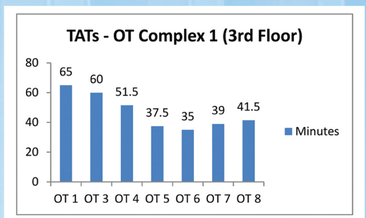
Average: 47.10 Minutes

Table 3 – Median TATs in Cathlab Complex

Cathlab 2	17.5 minutes
Cathlab 3	12.5 minutes

Average: 15 Minutes





RESULTS - UTILIZATION RATES

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

OT 1	69.15%
OT 2	86.68%
OT 3	82.75%
OT 4	86.15%
OT 5	84.38%
OT 6	76.57%
OT 7	83.69%

Average: 81.34%

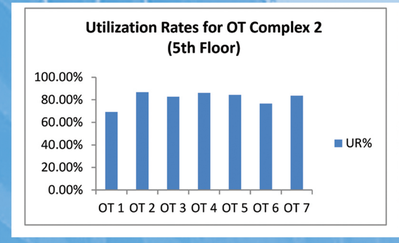


Table 5 – Average URs in OT Complex 1 (3rd Floor)

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%

Average: 68.51%

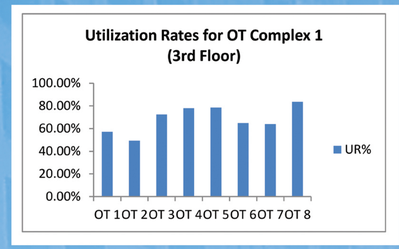
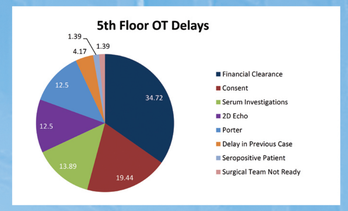


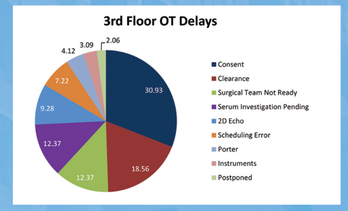
Table 5 – Average URs in Cathlab Complex

Cathlab 2	48.63%
Cathlab 3	55.71%

Average: 52.17%

RESULTS - DELAY FREQUENCY





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.