

OT UTILIZATION AT APEX HOSPITALS

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Introduction

A hospital's operation theatre complex represents a large investment in a hospital's budget, and it must be used to achieve the best cost-benefit ratio possible. Operation Theater is the most essential part of any surgical services in the Hospital. OT utilizations is the measure of the ratio of hours of OT time actually used during any surgery to the total available resource hours / day, on an average calculated to approximation.

An operating room utilizations analysis is required to assess the current workload as well as to optimize facility operations and patient scheduling for surgical procedures. It also assists in allocating reserve time for emergency operations, asepsis precautions and processes, and decision-making data for facility expansion or downsizing. In different healthcare settings, the amount of time spent on operations varies.

Link for the OT sheet

https://docs.google.com/spreadsheets/d/14kk-M8HGtOxN-5ToG7A_SuAZDFt_qwi4/edit?rtfpo=truet#gid=936742059

Rationale of Study

Getting the most out of OT hours was and still is a top concern for hospital management.

Apex Hospital is a 200 bedded hospital and is in its growing phase with a great inflow of patients from RGHS,CGHS,ECHS and other panel patients, resulting in an increase of total patient load thereby increasing the total OT procedures, to an average of about 400 OT per month which calls for making the OT utilization time to be more planned and efficient.

Considering this, a worry was made about making the best use of the hospital's resources. As a result, a study was conducted to analyze the overall use of the O.T. by various departments.

This will aid in not just assessing the current workload in the operating room, but also help in optimizing facility operations and proper scheduling of patients for surgical procedures.

Aim

To investigate the total OT utilization, and other OT-related parameters at Apex Hospital Malviya Nagar.

Objectives

1. To examine the overall use of OT
2. To understand the Root causes analysis of delay and rescheduling in OT procedures.
3. To identify the proportion of planned and unplanned surgeries
4. To determine the bottleneck in the proper and efficient use of Operation Theatre time & recommend remedial methods to improve Operation Theatre utilization

Methodology

An **Observational Prospective study** was carried out at Apex hospitals Malviya nagar which is a 200 bedded NABH accredited hospital for 1 month .

All over there were a total of 309 OT's done in the month of April (Including 4 Sundays for the month).

► Inclusion Criteria: In the sample size for this study only those OT happening on workday's i.e. From (Monday to Saturday) and starting from 9 am to 5 pm was included. A Random sampling method was used for this study and a sample size of 264 out of 309 of Total OT's for the month of April (25 days) was captured and observations were made.

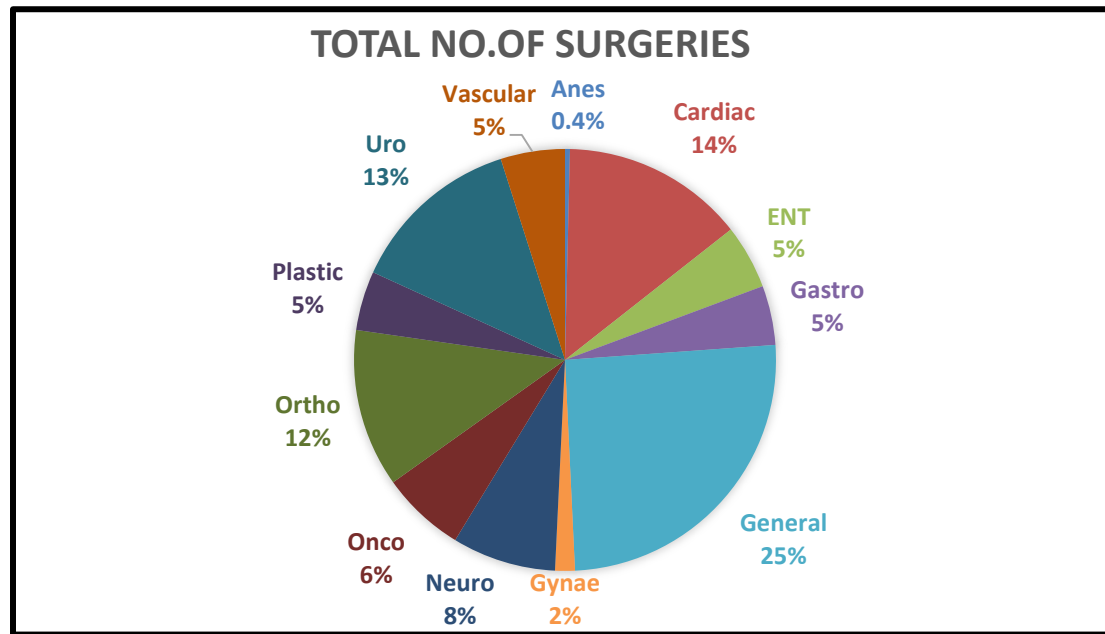
► Exclusion Criteria: All the OT's not falling under the above inclusion criteria were excluded. ie. 18 OT's done on Sundays and 27 OT's which were not falling under the resource utilization Time for OT (9am to 5 P m) was excluded. A total of 45 OT was not taken into the sample size (18 on Sundays+27 not falling under the Utilization hours).

The OT timing scheduled for elective cases was from 09:00 hrs-17:00 hrs.(8hours ie.480 min/day) for all the 5 OT's. All the 5 OT's were observed and the shift in and shift out time for the patients was recorded by taking rounds and checking patient files the next day.

Results and Analysis

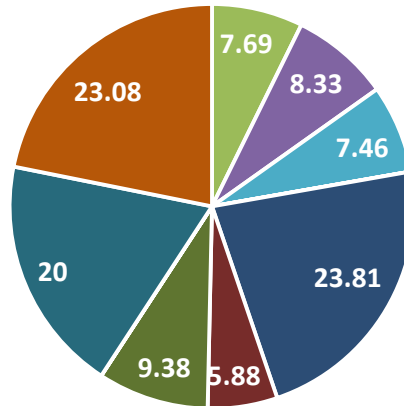
Department	Total OT	Planned OT	Unplanned OT	Re-exploration/Surgery Modification/Re-Schedule	Emergency	Planned %	Unplanned %	Re-exploration/Surgery Modification/Re-Schedule %
Anesthesia	1	1	0	0	0	100	0	0
Cardiac	37	37	0	0	0	100	0	0
ENT	13	12	1	0	0	92.31	7.69	0
Gastro	12	11	1	0	0	91.67	8.33	0
General	67	56	5	4	2	83.58	7.46	5.97
Gynae	4	4	0	0	0	100	0	0
Neuro	21	10	5	6	0	47.62	23.81	28.57
Oncology	17	15	1	1	0	88.24	5.88	5.88
Ortho	32	27	3	1	1	84.38	9.37	3.13
Plastic	12	12	0	0	0	100	0	0
Urology	35	26	7	2	0	74.29	20	5.71
Vascular	13	8	3	1	1	61.54	23.08	7.69
Total	264	219	26	15	4	82.95	9.85	5.68

General Speciality wise Analysis



- Out of the total surgeries performed in the study period, 64% surgeries were performed under the speciality of General surgery, Cardiology, Urology and Orthopedics. With the remaining speciality accounting for about 34% including Gastro surgery, gynecology, Neurology, Oncology, Plastic Surgery, ENT and anesthesiology.
- The most no of surgeries were performed under the speciality of general surgery with a percentage of about 25 % with Lap cholecystectomy being the most performed procedure under it. Following General surgery, Cardiology department accounted for about 14 % of the total surgery with CABG being the most performed procedure.
- Urology accounted for 13% of the total surgeries with URSL being the most performed procedure. Orthopedics accounted for about 12% of the total surgeries with TKR being the most performed surgery.

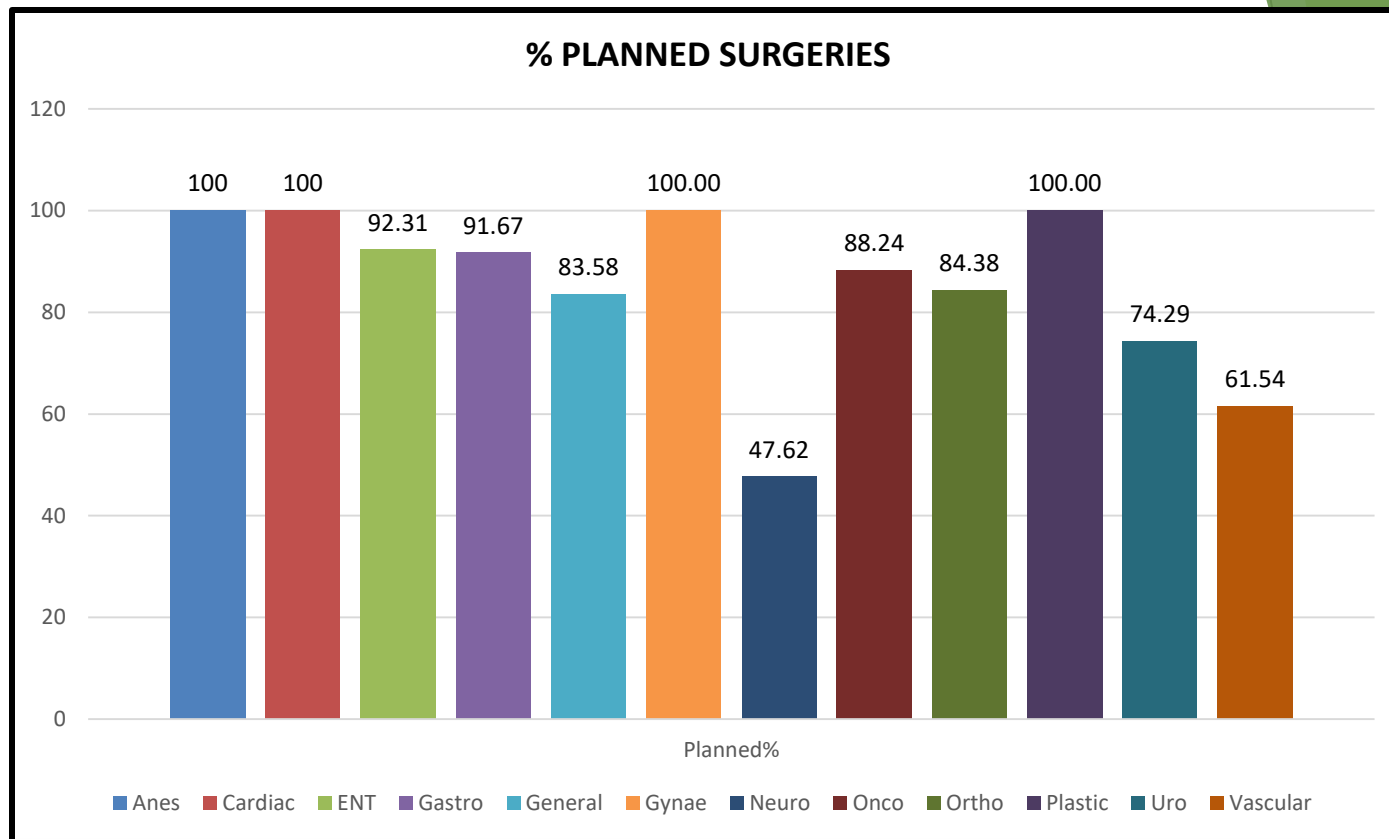
UNPLANNED OT%



■ Anes ■ Cardiac ■ ENT ■ Gastro ■ General ■ Gynae
■ Neuro ■ Onco ■ Ortho ■ Plastic ■ Uro ■ Vascular

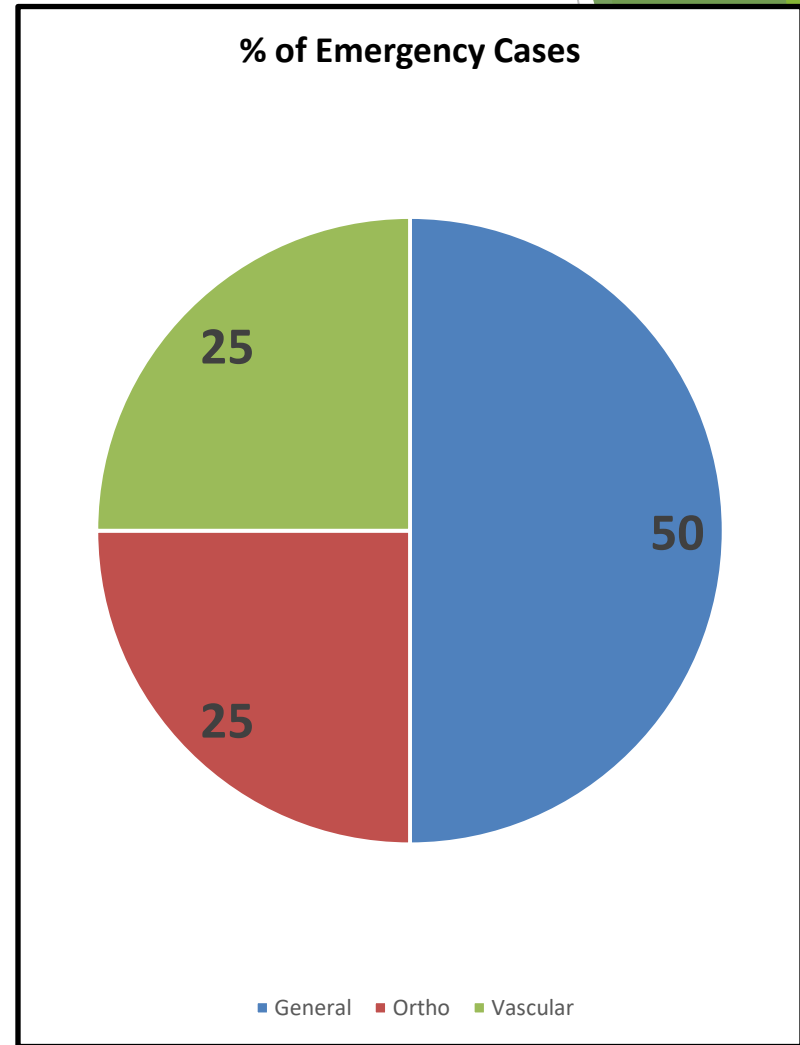
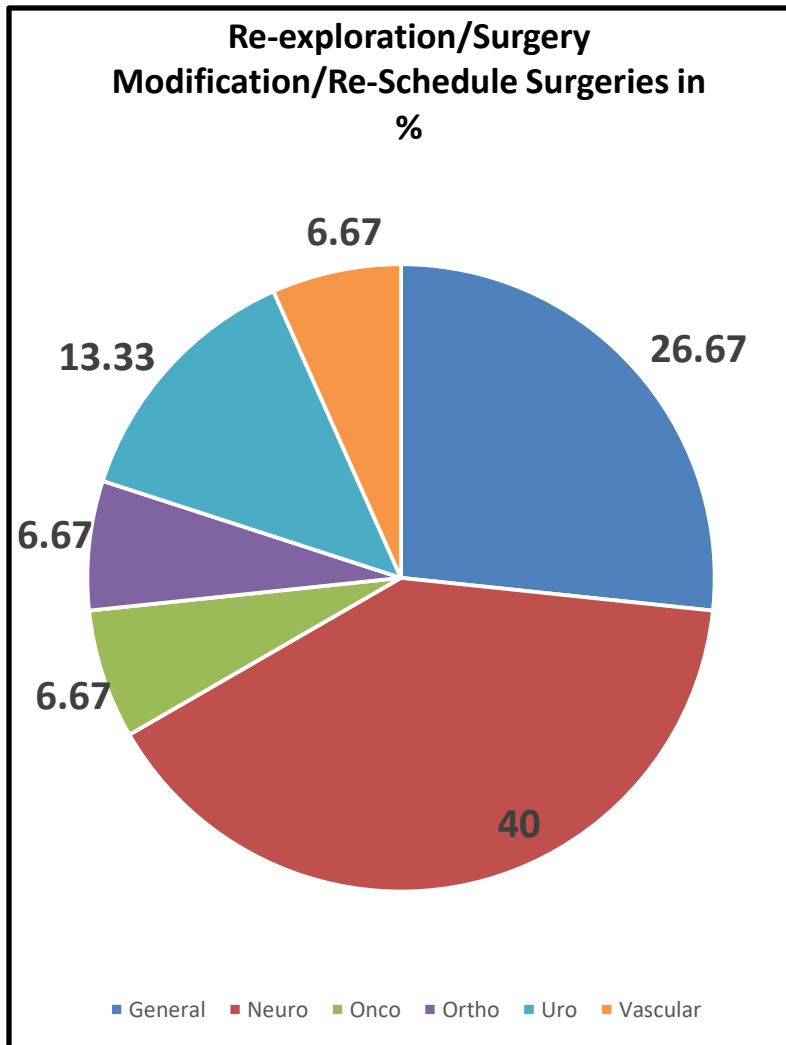
The above graph shows that out of 264 surgeries that happened in the study period between the resource hours from 9:00 am to 5:00 pm, 66.89% of the unplanned surgeries were from Neurology, Vascular Surgery and Urology department with the remaining of 33.11% unplanned surgeries from ENT, Gastroenterology, General Surgery, Oncology and Orthopedics department.

The most cases of unplanned surgeries were from Vascular Surgery and Neurology department which were about 23.08% and 23.81 respectively, followed by Urology accounting for 20 %, Orthopedics 9.38%, Gastroenterology 8.33%, ENT 7.69%, General surgery 7.46%, and Oncology 5.88.



Out of all the surgeries happening during the study Anesthesia, Cardiac Surgery, Gynecology and Plastic Surgery showed a 100% planned OT rate, Followed by ENT showing 92.3% planned surgeries, 91.67 % for Gastrology, 88.24% for oncology, 84.38% for Orthopedics, 83.58% for general surgery , 74.29% for Urology and 61.54% for Vascular surgeries.

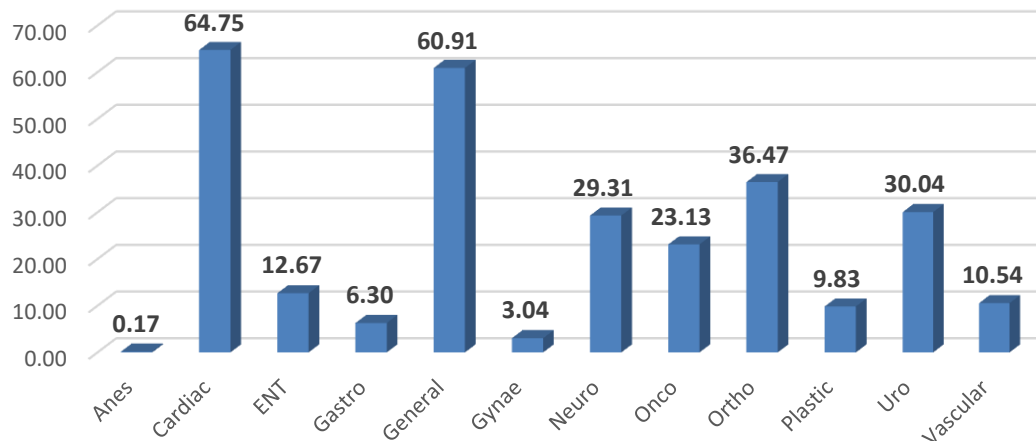
Re-exploration/Surgery Modification/Re-Schedule Surgeries and Emergency OT's Analysis Speciality wise



Speciality wise % Utilization of OT's

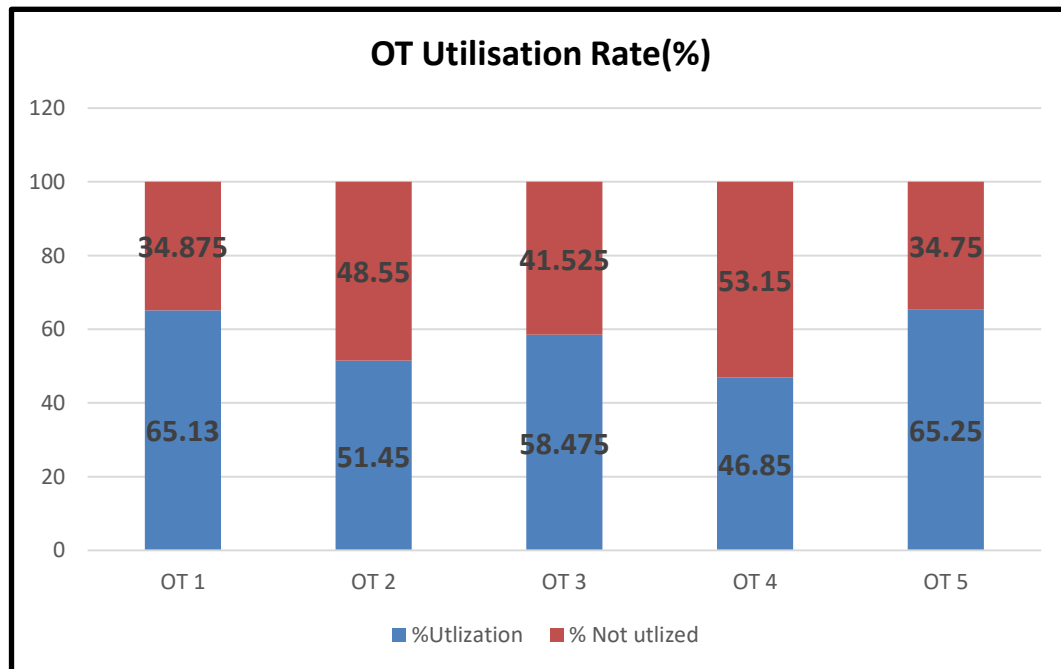
Department	Total Cases	Total time utilized(Planned +Unplanned)in min	Resource OT Time in min	OT Utilization(%)
Anesthesia	1	20	12000	0.17
Cardiac	37	7770	12000	64.75
ENT	13	1520	12000	12.67
Gastroenterology	12	756	12000	6.3
General	67	7309	12000	60.91
Gynecology	4	365	12000	3.04
Neurology	21	3517	12000	29.31
Oncology	17	2775	12000	23.13
Orthopedics	32	4376	12000	36.47
Plastic Surgery	12	1180	12000	9.83
Urology	35	3605	12000	30.04
Vascular	13	1265	12000	10.54

OT utilization Speciality wise



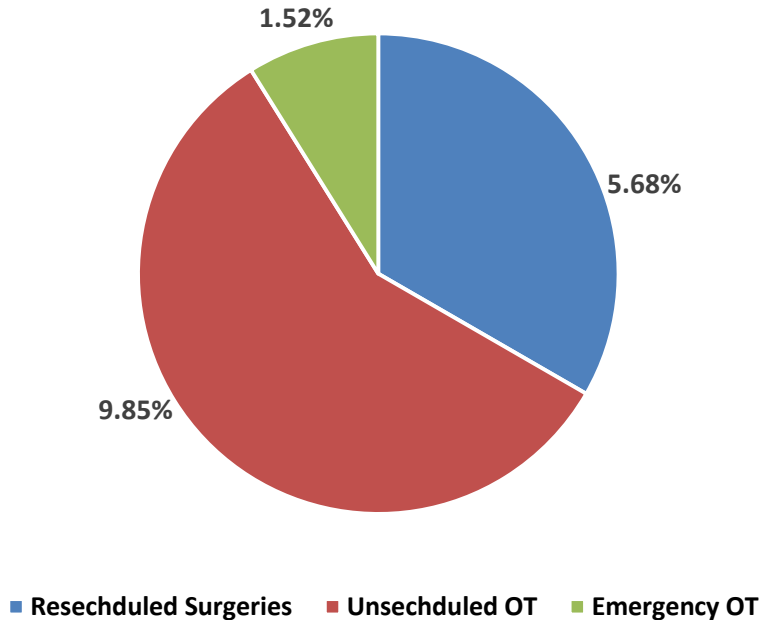
OT wise % Utilization

OT. No	Total Procedure	Total Resource hour available (hrs)	Total Resource hour available (min)	Average time for surgeries	Hours utilized (Planned+ Unplanned) including OT Cleaning time (min)	Hours not utilized (Planned +Unplanned)(min)	%Utilized	% Non-Utilized
OT 1	62	8	12000	126	7815	4185	65.13	34.88
OT 2	67	8	12000	92	6174	5826	51.45	48.55
OT 3	54	8	12000	130	7017	4983	58.48	41.53
OT 4	43	8	12000	131	5622	6378	46.85	53.15
OT 5	38	8	12000	206	7830	4170	65.25	34.75

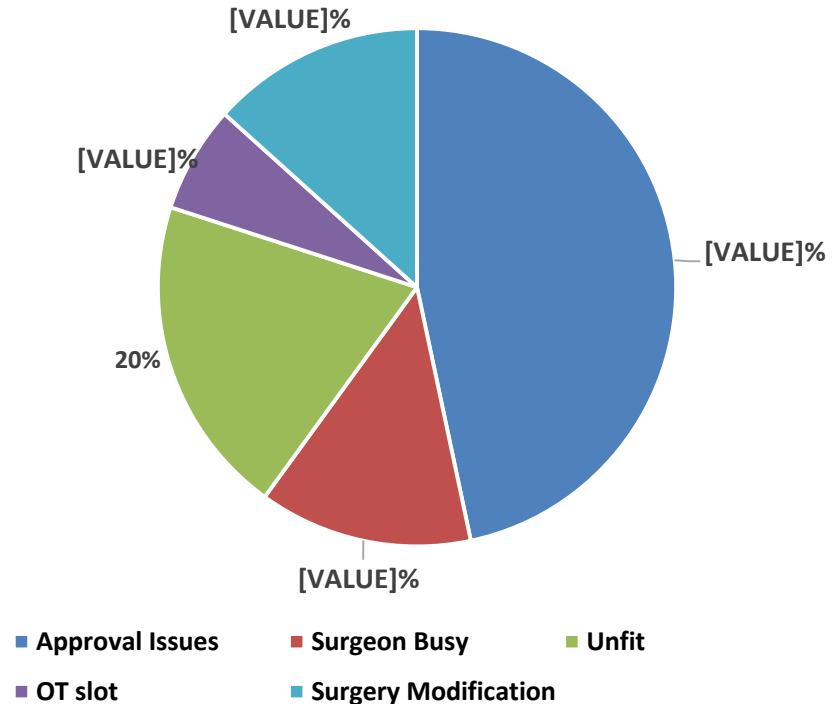


Issues in OT's

Re-Sechduled/Unsechduled/Emergency OT %



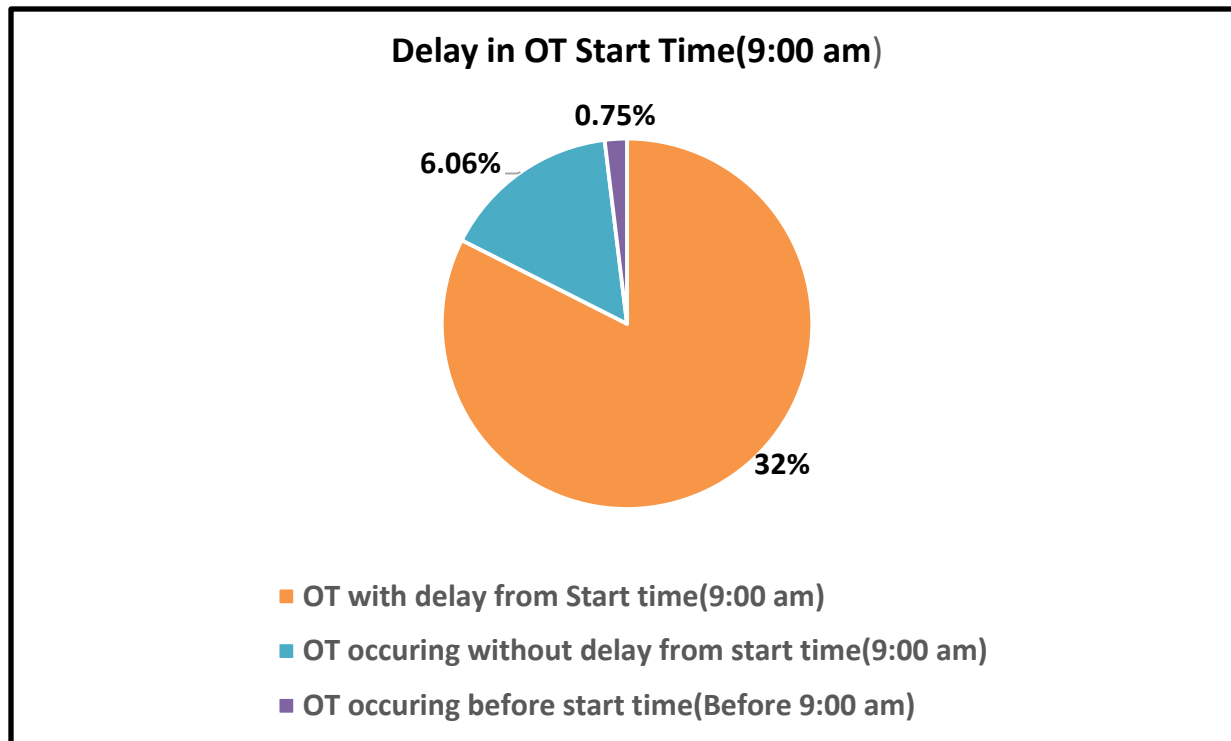
Re-scheduled OT Reasons



Other Delay reasons:-

- Patient being shifted late from the ward is one the most prevalent reason for the delay in commencing the operation table, followed by administrative issues, the patient's medical state, and the operating surgeon reporting late.
- The most common causes for cancellation or Rescheduling were approval issues, Surgeon being busy, unavailability of the OT Slot , patient being unfit for surgery because of the patient's medical reasons or conditions, the patient's refusal to be admitted, a last-minute modification in the surgical plan, and administrative issues such as linen and autoclaved equipment not being available. Various reasons for postponement of scheduled cases included the absence of a senior surgeon, an ICU bed etc.

Delay in Usual start of OT time for the day



Average Delay in OT start time from 9:00 am as ideal the OT start time	Time in hh:mm
OT 1	01:25
OT 2	01:47
OT 3	01:04
OT 4	01:55
OT 5	00:53

Recommendations & Suggestions to increase the OT utilization and efficiency

1. Grouping of OT's

It is recommended to group the different OT's speciality wise depending upon the utilization in order to streamline the different procedures in dedicated OT which will avoid any clash with other planned procedures

Department	OT utilization	OT no.
Cardiac	64.75	OT 1
General	60.91	OT 2
Gastroenterology	6.3	OT 2
ENT	12.67	OT 2
Neurology	29.31	OT 3
Orthopedics	36.47	OT 3
Plastic Surgery	9.83	OT 3
Urology	30.04	OT 4
Vascular Surgery	10.54	OT 4
Onco Surgery	23.12	OT 5

- In my view, Cardiac surgery should be given a dedicated OT due to its high utilization rate. General Surgery and Gastroenterology can be grouped together as OT 2. Neurology, Orthopedics and Plastic Surgery can be grouped together as OT 3. Urology and Vascular Surgery can be grouped under OT 4 and Onco surgery can be grouped under OT 5.
- One dedicated OT should be made for emergency OT's like general trauma, head injury, burns etc. and only emergency cases and procedures should be allowed to be performed there.

2.Pre-Released OT schedule

3.Remind surgeons to request and release OT Slots in advance

Reminding surgeons and their coordinators to release the OT slots they don't intend to use is one of the simplest ways to enhance operating room usage. If a surgeon arrives late, they should not be given the chance to start with the first OT slot for the day, it will maintain strictness amongst them and will save time for other minor surgeries which can be used in major OTs.

4. Pre-Op /Post.Op ward

Pre-op and Post-op ward should be there on the same floor as that of the OT, to reduce shifting time from ward to OT due to lift issue or any other shifting problem . Patient should be shifted in the pre-op ward or on the same floor a day before his/her OT. This will help in cutting of extra time due to any issue and a quick shifting with full preparation to the OT in time.

Patient preparation(Investigations etc.) and all the consent related formalities should be done at the pre op ward only.

5.Improve First Case On-Time Start

Delays in the start of the OT in the mornings waste a significant amount of useful OT time and result in surgery cancellations later in the day or overlapping with the time duration of other surgical procedures, reducing daily OT utilization. As a result, on the night before surgery, appropriate communication among the surgeon, anesthetist, and nursing staff can help avoid morning delays.

It should be made sure that the first case of the day should be started positively by 9:00 am in the morning, any surgeon causing a delay in start of the OT, should not be allowed for the procedure, this would set discipline across them and the whole process.

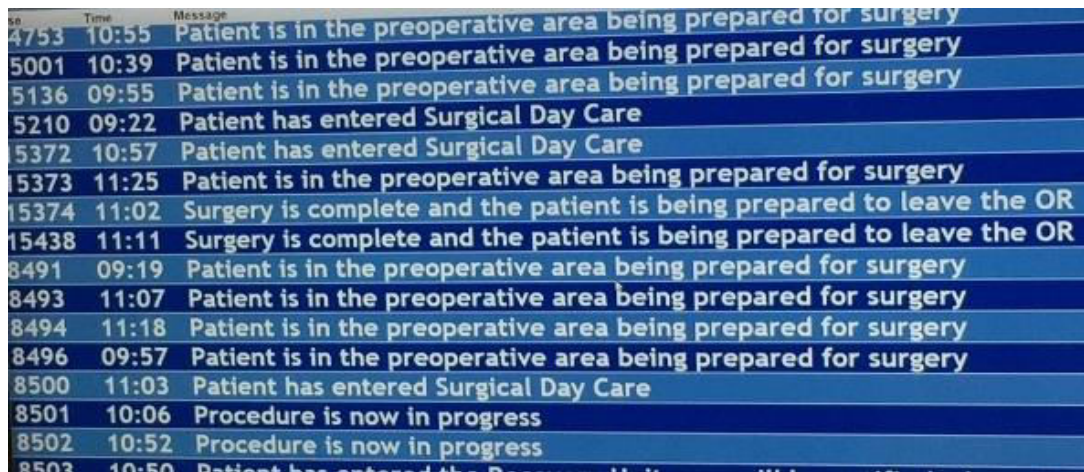
Delays in starting the OT on time results in an inefficient use of available resource hours. This issue can be sorted by improving the inter and intra departmental communication between the patient and the surgeon which will make the patient fully understand the pre-operative instructions.

A good and timely level of communication between the OT nurses and the ward nurses will also save a lot of time and help in the smooth shifting for any planned surgery from wards to OT.

5. Refilling of Empty slots

If a slot is vacant, it should be investigated to see if another doctor can fill it, or it should be coordinated with the staff to check into scheduling and determine why that slot was left vacant or which surgery was cancelled.

6. Live OT tracking Software



ID	Time	Message
4753	10:55	Patient is in the preoperative area being prepared for surgery
5001	10:39	Patient is in the preoperative area being prepared for surgery
5136	09:55	Patient is in the preoperative area being prepared for surgery
5210	09:22	Patient has entered Surgical Day Care
5372	10:57	Patient has entered Surgical Day Care
5373	11:25	Patient is in the preoperative area being prepared for surgery
5374	11:02	Surgery is complete and the patient is being prepared to leave the OR
5438	11:11	Surgery is complete and the patient is being prepared to leave the OR
8491	09:19	Patient is in the preoperative area being prepared for surgery
8493	11:07	Patient is in the preoperative area being prepared for surgery
8494	11:18	Patient is in the preoperative area being prepared for surgery
8496	09:57	Patient is in the preoperative area being prepared for surgery
8500	11:03	Patient has entered Surgical Day Care
8501	10:06	Procedure is now in progress
8502	10:52	Procedure is now in progress
8503	10:50	Patient has entered the Preoperative area

- Large monitors can be made visible in all units as well as in the waiting rooms and update families and staff of the patient's status using the UHID ,also it will streamline the process of OT allocation to different surgeons and help us in preparing the next patient before hand. It will help in Real Time tracking of patients.
- This live tracking tool will make the surgery experience more efficient by letting all caregivers in every department to monitor the patient's location, status, and other pertinent information. It will improve inter- and intra-departmental communication while also reducing the number of calls made between departments.

Conclusion

From the above study it can be concluded that out of the total of 264 surgeries performed during the study period that happened within the Resource hours of OT i.e..(9 am to 5pm) 82.95% of the surgeries were planned, 11.87% were unplanned and 5.18 % were emergency OT's.

OT 1 and OT 5 were utilized the most in the resource hour i.e. for about 65% each approximately. OT 4 was utilized for about 53 %,followed by OT 2 about 48 %.OT 3 was the least utilized OT with a utilization rate of 41% out of all the OT.

It clearly shows that the scheduling of OT needs improvement. The OT start for the day should not be delayed, it should start positively by 9 am for a proper utilization of time and avoid any wastage of time. The more predictable cases should be scheduled sooner to optimize operating room efficiency and scheduling, giving more time for surgeries that may require more time.

Operation theatres are the "heart of the hospital." In a hospital budget, the operating room represents a significant expenditure. The most efficient use of the OT not only lowers operating costs but also boosts revenue, for that becomes fairly important that the OT scheduling processes are made smooth which would ultimately lead to increase in its Utilization and thereby increase in hospital revenue.

*Thank
you*

