# OT UTILIZATION AT BOKARO GENERAL HOSPITAL.

Submitted By : Vani Sri

Roll No. : 1648

MBA in Hospital & Health Management

# INTRODUCTION

Operating theatres (OTs) are critical components of hospital infrastructure and play a key role in patient care. These are specialized facilities designed to perform surgical procedures under sterile conditions, equipped with modern medical equipment and staffed by qualified medical professionals. The importance of OT in a hospital spans multiple dimensions, including patient outcomes, hospital efficiency, and overall health care delivery.

Effective use of operating theatres(OTs) is critical to optimal hospital performance, affecting patient outcomes, staff satisfaction, and overall healthcare costs. This study aims to investigate the various factors influencing the use of OT and identify the most common causes of delays.

# RATIONALE OF STUDY

Optimal use of these facilities directly impacts patient outcomes, hospital revenue, and overall healthcare efficiency. Bokaro General Hospital, a key healthcare provider in the region, has recognized the need to enhance the efficiency of its OT operations.
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While on other hand it impact directly to clinical outcomes like,

A.**Clinical Outcomes**: It is a well know fact that with optimal use of OTs will provide the desirable outcome.

B**. Economic Impact**: OTs are one of the most resource demanding units in a hospital. These require high levels of infrastructure, technology and manpower investments. Poor use of OT time can lead to not utilising resources efficiently and missing chances for revenue stream. Said more simply, if hospitals can optimize OT use they will do a lot better on their financial performance and sustainability.

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C.**Operational Efficiency**: Streamlined OT management leads to the smooth running of the overall operations in a hospital. Decrease in turnover times, simplification workflows, and better coordination among surgical teams can enhance productivity. This study aims to identify best practices and innovative approaches to improve operational efficiency in OTs.

D. **Patient Satisfaction**: Long waiting times for surgery and frequent cancellations can negatively impact patient satisfaction. Efficient OT utilization can lead to shorter waiting times, timely surgeries, and better postoperative care, thereby improving patient satisfaction and hospital reputation.

AIM :

To Investigate the OT Utilization and OT related parametres at Bokaro General Hospital, Bokaro Steel City, Jharkhand.

OBJECTIVE :

- • Calculate and determine the utilization rate of the operating theatre in Bokaro General Hospital.
- • Understand the most common cause of delay in surgery.
- • Suggestions for maximizing the use of the Operating Theatre according to the findings

# METHODOLOGY

An Observational Prospective study was carried out at Bokaro General Hospital, which is a 600 bedded hospital for 8 weeks .

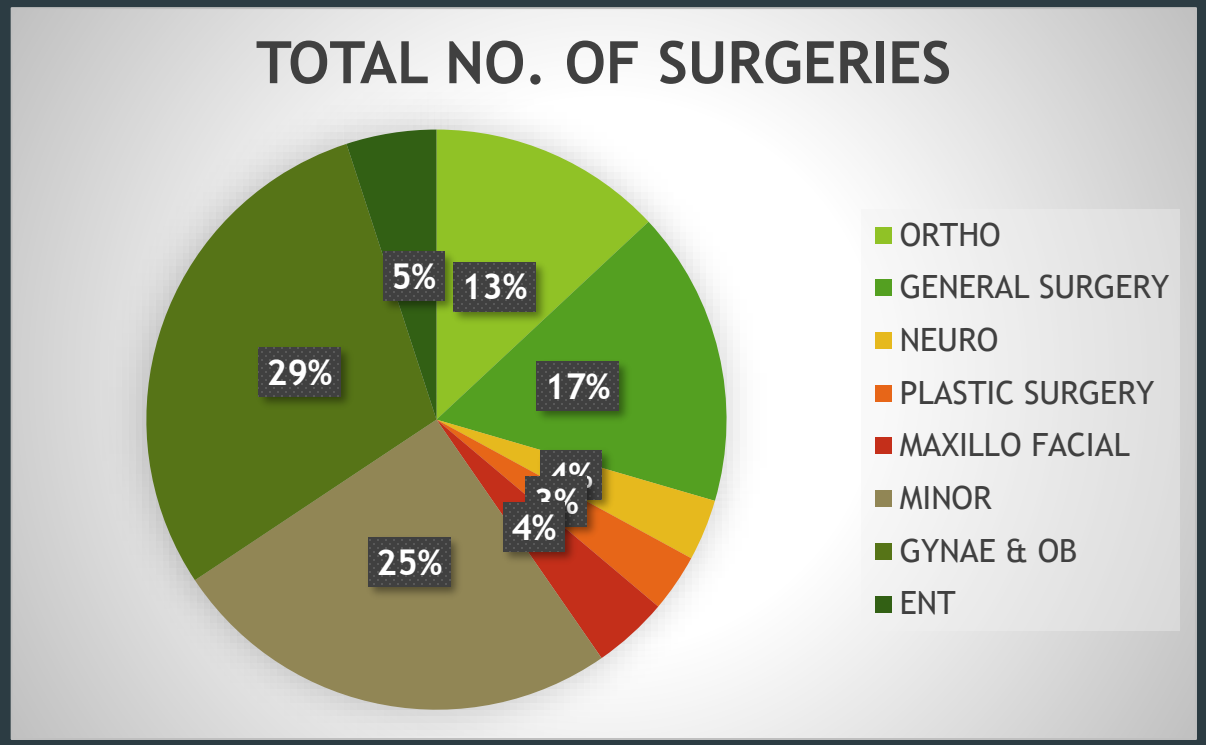
All over there were 648 cases which were done during this time period,( i.e from April 15$^{th}$ – June 15$^{th}$ ) including the Sundays.

- Inclusion Criteria – In the sample size for this study only those OT happening on workdays i.e from Monday to Saturday and starting from 9am to 3pm were included. A Random Sampling Method was used for this study and a sample size of 614 out of 648 of total OT's. 14 Days in the month of April, 26 days in the month of May and 13 days in the month of June.
- Exclusion Criteria – All the OT's not falling under the above inclusion criteria were excluded i.e 19 OT's done on Sunday and 15 OT's which were not falling under the resource utilization Time for OT's i.e (9am-3pm) was excluded. A total of 34 OT was not taken into the sample size.

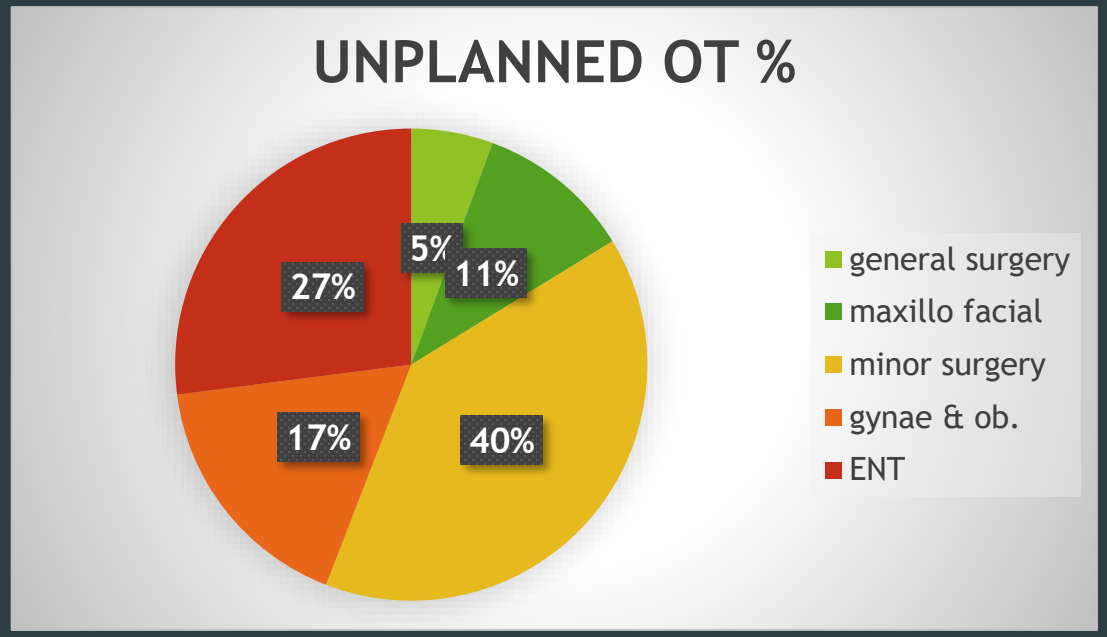
The OT Timing for scheduled cases was 9 am to 3 pm. (6hrs i.e 360 mins/day) fr all the 6 OT.

| DEPARTMENT | TOTAL OT | PLANNED OT | UNPLANNED OT | EMERGENCY | PLANNED OT % | UNPLANNED OT % |
|---|---|---|---|---|---|---|
| ORTHO | 80 | 80 | 0 | 0 | 100 | 0 |
| GENERAL SURGERY | 101 | 97 | 4 | 0 | 96 | 4 |
| NEURO | 21 | 21 | 0 | 0 | 100 | 0 |
| PLASTIC SURGERY | 20 | 20 | 0 | 0 | 100 | 0 |
| MAXILLO FACIAL | 26 | 22 | 2 | 2 | 84.6 | 7.6 |
| MINOR SURGERY | 155 | 101 | 44 | 10 | 65 | 28.3 |
| GYNAE & OB. | 180 | 141 | 22 | 17 | 78.3 | 12.2 |
| ENT | 31 | 25 | 6 | 0 | 80.6 | 19.3 |
| TOTAL | 614 | 507 | 78 | 29 | 82.5 | 12.7 |

# GENERAL SPECIALITY WISE ANALYSIS

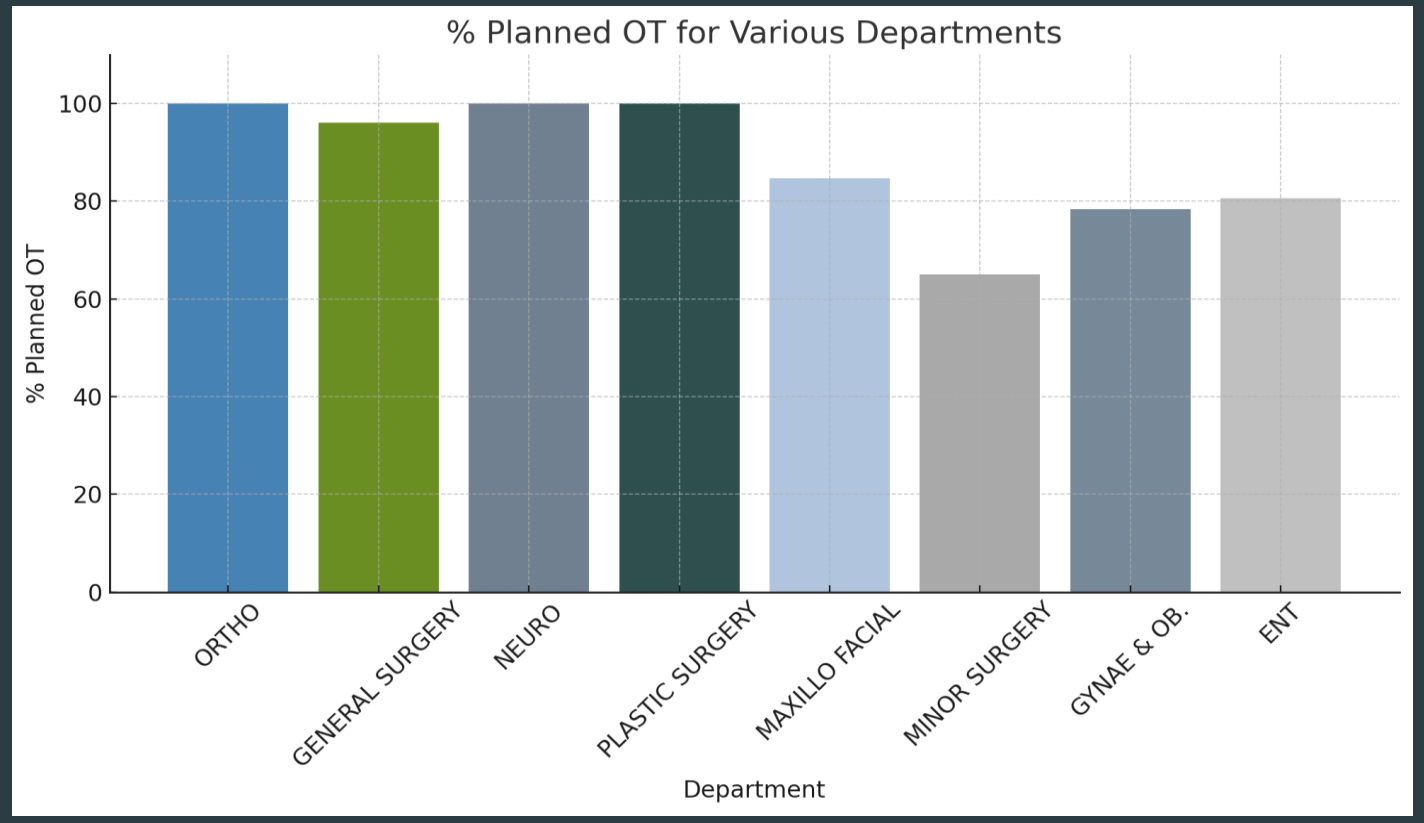



- In the total surgeries performed under the study period, 84% of the surgeries were performed by the departments Gynae & Ob. ,OT dedicated to minor surgeries,General Surgery & Ortho Department. The OT which is dedicated to perform minor surgeries usually performs surgeries under LA. The cases usually come from surgical OPD during their designated timings. Gynae and Ob.  performs the most no. of surgeries with LSCS, followed by TAH and Dilation and curettage.




Minor surgery has the highest percentage of unplanned OT , accounting for 39.6% of the total. The second highest, with 27% of unplanned OT is ENT and the department of gynae and ob. accounts for about 17% of unplanned OT.

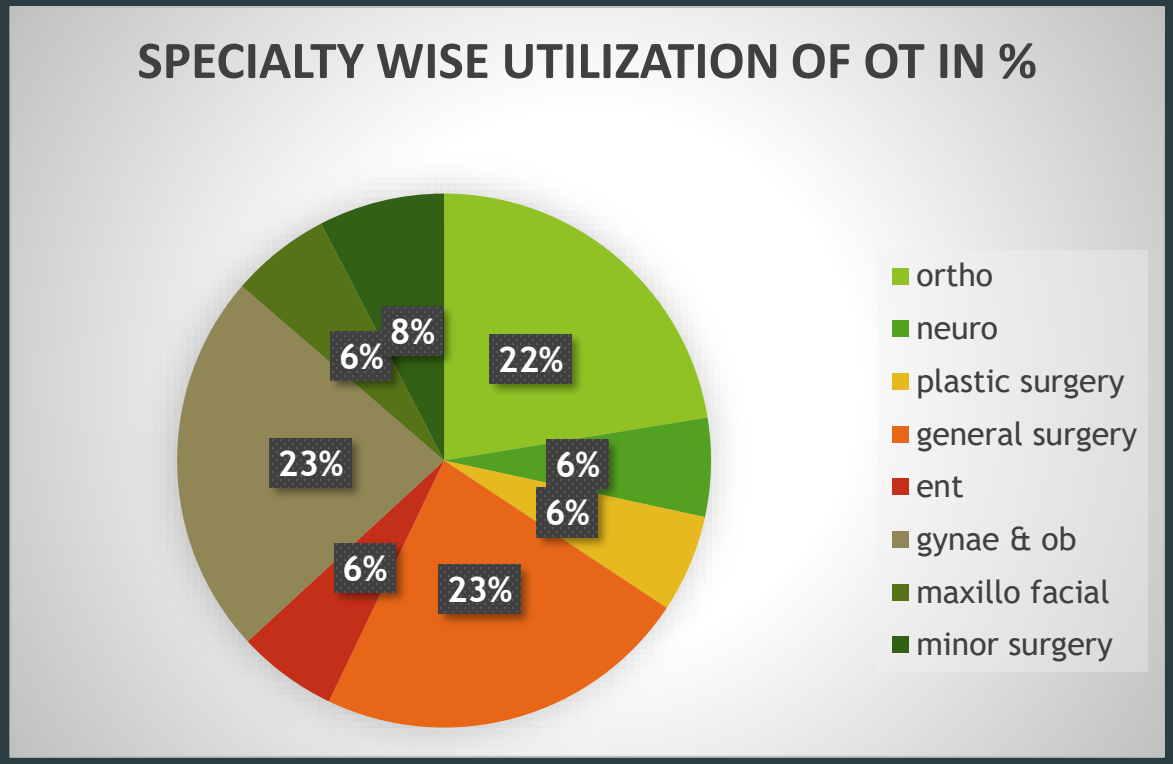
This distribution highlights that minor surgery, ENT, Gynae & Ob. Departments experience the most unplanned operations, while the other departments manage to plan all their OT effectively.




The graph shows a high percentage of planned OT across most departments with Ortho, Neuro and Plastic Surgery achieving 100% . Departments like Minor surgery ENT and Gynae & Ob. have a higher number of unplanned or emergency surgeries , suggesting greater unpredictably in their scheduling.

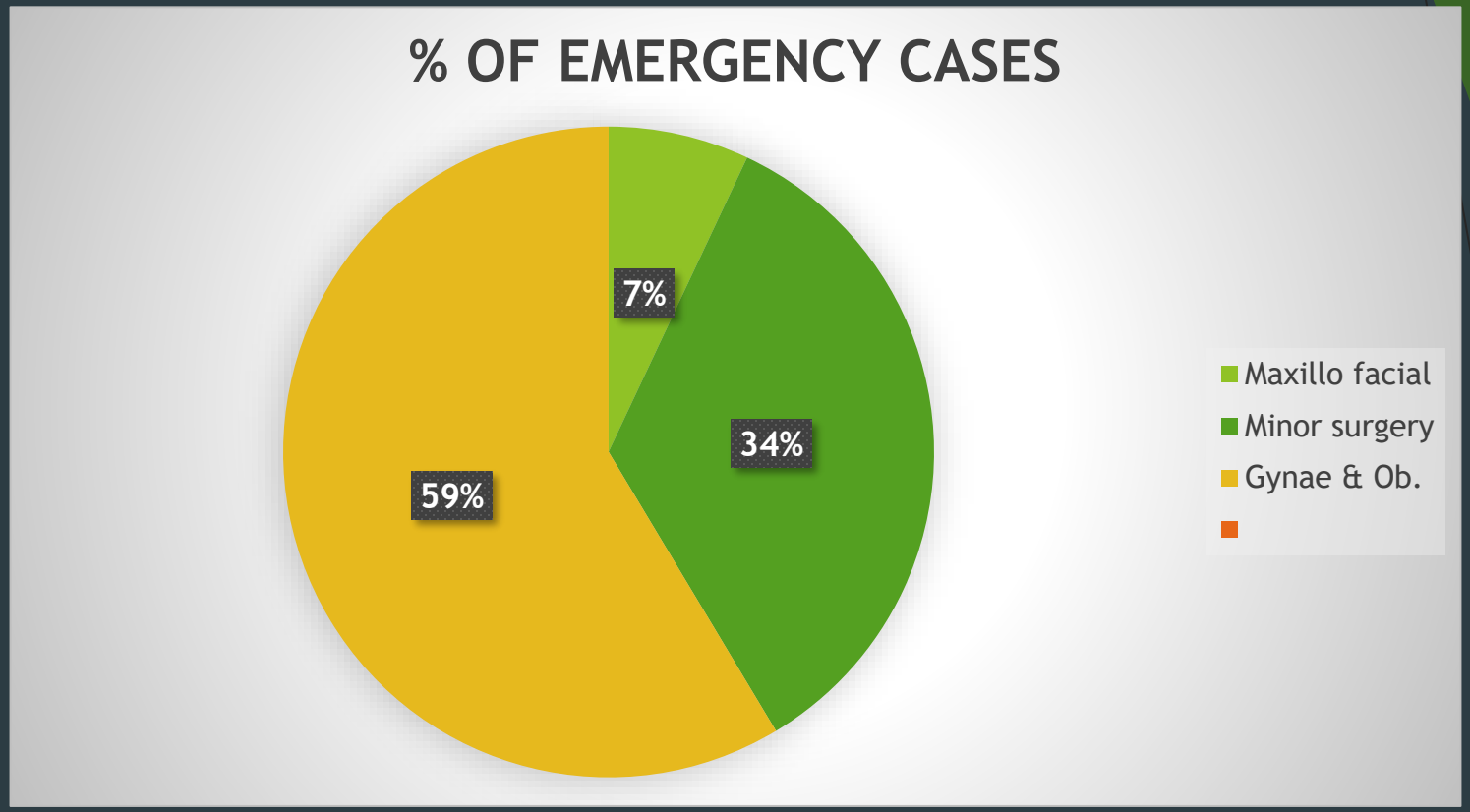
# SPECIALTY WISE UTILIZATION OF OT IN %

| DEPARTMENT | TOTAL CASES | TOTAL TIME UTILIZED | TOTAL RESOURCE HRS. | % OT UTILIZATION |
|---|---|---|---|---|
| ORTHO | 80 | 11465 | 19,080 | 60 |
| GENERAL SURGERY | 101 | 11560 | 19,080 | 61 |
| NEURO | 21 | 3065 | 19,080 | 16 |
| PLASTIC SURGERY | 20 | 3025 | 19,080 | 15.8 |
| MAXILLO FACIAL | 26 | 3155 | 19,080 | 16.5 |
| MINOR SURGERY | 155 | 3900 | 19,080 | 20.4 |
| GYNAE&OB. | 180 | 11750 | 19,080 | 62 |
| ENT | 31 | 3100 | 19,080 | 16.2 |



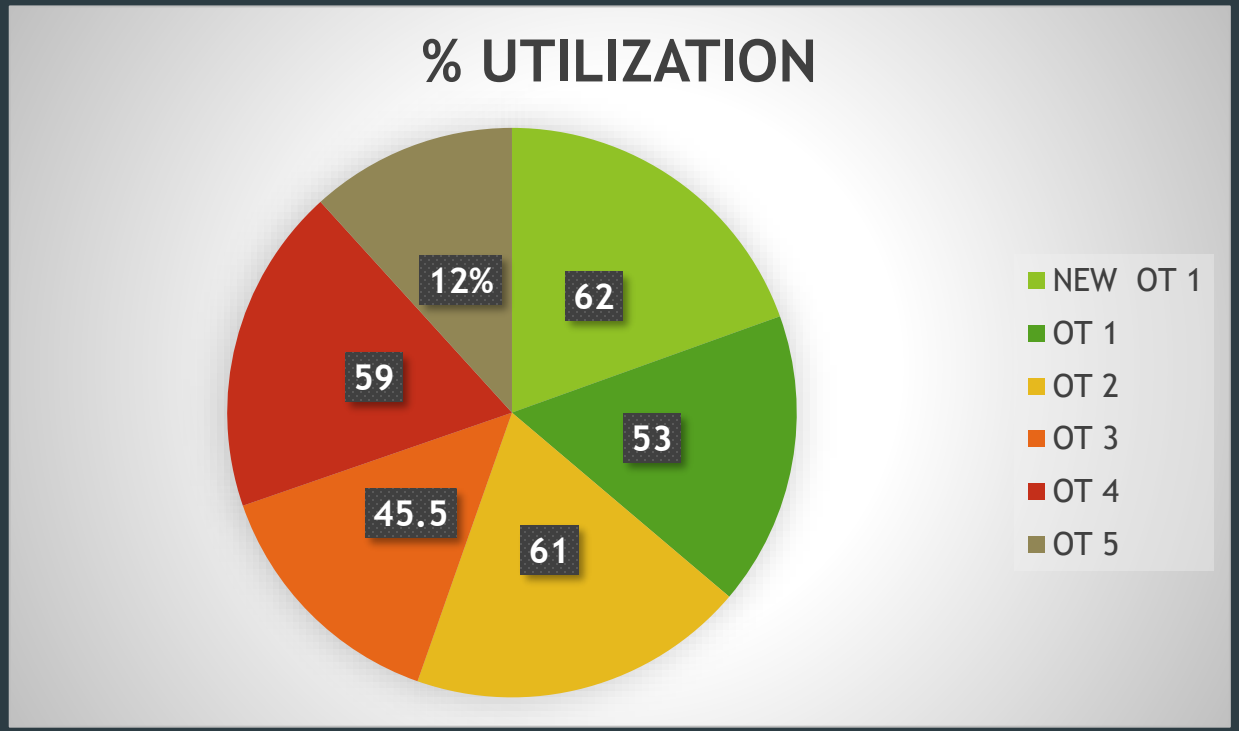

The pie chart shows the percentage distribution of Operation Theatre (OT) utilization across various specialties namely Ortho, General Surgery, Neuro, Plastic surgery, ENT, Gynae and Ob., Maxillo Facial and Minor Surgery . This information is crucial for hospital administration to optimize the scheduling and allocation of OT resources.

The above chart shows that Gynae & Ob. and General Surgery are using the OT the most which is 62 and 61 percentage respectively. Department of Orthopaedics uses the OT for about 60 percentage, followed by minor surgery which uses for 20.4 percentage and ENT which uses for 16.2 percentage while neuro uses for about 16 percentage




At 59%, the department of obstetrics and gynecology (Gyn & OB) is responsible for the greatest percentage of emergency patients.
Preeclampsia, labor emergencies, and other obstetric crises, as well as the unpredictability of childbirth are likely to blame for the high percentage of emergencies in this area. To properly handle these instances, strong emergency protocols and adaptable resource allocation are  required.

| O.T NOS. | TOTAL PROCEDURES | TOTAL RESOURCE HOURS | TOTAL RESOURCE HOURS (MINS) | HOURS UTILIZED (PLANNED+UNPLANNED) | HOURS NOT UTILIZED | % UTILIZED | % NOT UTILIZED |
|---|---|---|---|---|---|---|---|
| NEW OT 1 | 78 | 6 | 19080 | 11850 | 7230 | 62 | 38 |
| OT 1 | 96 | 6 | 19080 | 10120 | 8960 | 53 | 47 |
| OT 2 | 135 | 6 | 19080 | 11675 | 7405 | 61 | 39 |
| OT 3 | 62 | 6 | 19080 | 8670 | 10410 | 45.5 | 54.5 |
| OT 4 | 91 | 6 | 19080 | 11270 | 7810 | 59 | 41 |
| OT 5 | 152 | 6 | 19080 | 7120 | 11960 | 37.3 | 62.7 |




At 62%, the new OT has the greatest utilization rate. It shows that a sizable amount of the capacity or resources allotted to "new OT 1" is being used.

The OT 1 utilization percentage is 53%, which is marginally less than that of "new OT 1." It implies that this category has a moderate level of consumption.

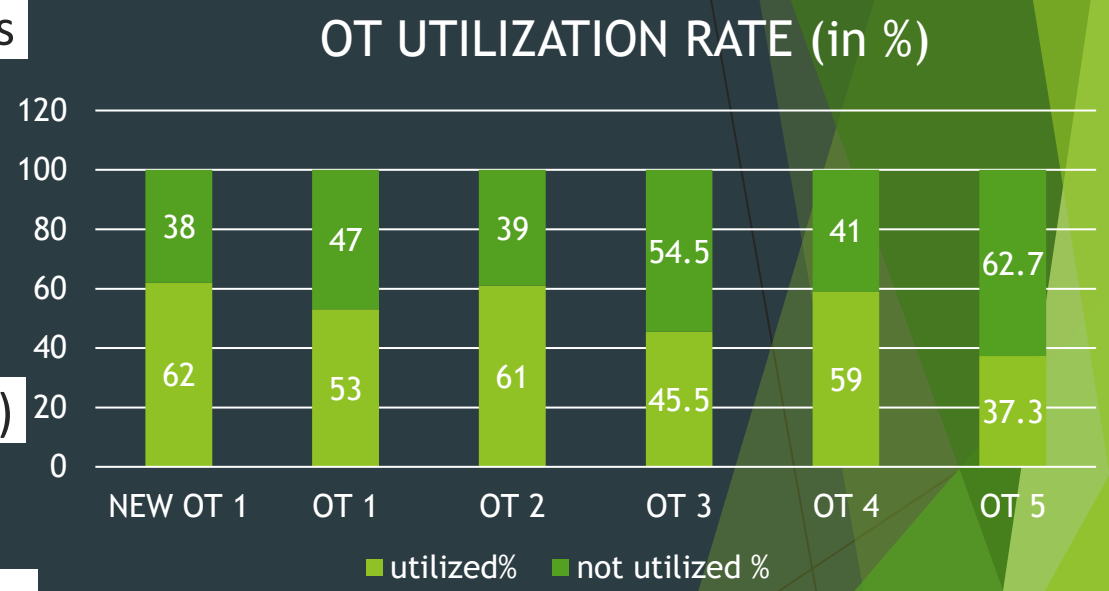
Like "new OT 1," the OT has an 18% utilization rate, which suggests that resources are used to a significant degree in this area.

At 45.5%, OT 3 has the lowest utilization rate. It suggests that, in comparison to the other categories, there is a lower degree of resource usage within this one.

New OT 1: Utilized % - 62. Not Utilized% - 38. This OT has a relatively high utilisation rate with 62% of the resources being properly utilized.

OT 1 has a utilization rate of 53% whereas 47% resources remained unconsumed. OT 2 had a utilisation rate of 61% while 39% of the resources remained underutilised. OT 2 has been mainly dedicated to Gynae and Ob. with Dilation and curettage being the most common procedure with Total intravenous anaesthesia being induced for the same. The major surgeries include TAH (Total Abdominal Hysterectomy) and vaginal hysterectomy and Total pelvic repair.

OT 3 has a utilisation rate of 45.5% where as 54.5%., whereas OT 4 has been dedicated to general surgery with cholecystectomy and Appendectomy being the most performed surgery under the influence of GA.



# REASONS FOR DELAYS IN SURGERY

1. Approval Issue
2. Time taken for patient to be shifted from wards to pre-op area.
3. Surgeon busy
4. Unavailability of OT slots.
5. Patient unfit for surgery
6. Surgery Modificatins

# RECOMMENDATIONS FOR IMPROVING OT EFFICIENCY

**Grouping of OT's**

Operation theater (OT) grouping can greatly improve their optimization through improved resource allocation, procedure simplification, and surgical team coordination. This method, which groups OTs according to particular standards such surgical specializations, operation types, or case urgency, can result in a more effective and efficient utilization of the facilities.

**Pre – release OT schedule**

By enabling better planning, lowering uncertainty, and enhancing cooperation among all parties engaged in the surgical procedure, pre-releasing the operation theatre (OT) schedule can greatly improve its optimization. By taking a proactive stance, OT resources are used as efficiently as possible, which ensures smooth surgical procedures and better patient results.

**Pre – op and post – op being on the same floor as the OT**

The optimization of surgical operations can be greatly enhanced by placing pre-op and post-op departments on the same floor as the operation theatre (OT). This can be achieved through improved efficiency, streamlined patient flow, and better resource use. Being close by makes transitions and coordination easier, which eventually improves patient care and boosts operational effectiveness.

**Live OT Tracking**

Through the provision of real-time visibility into surgical operations, enhanced coordination and communication, and the ability to make data-driven decisions, live operation theatre (OT) tracking can greatly improve the optimization of OTs. Using cutting-edge technologies like RFID tags, Internet of Things (IoT) devices, and specialized software, live tracking systems provide real-time monitoring and management of surgical process status and progress.

# CONCLUSION

From the above study it can be concluded that out of 614 surgeries performed during the study period that happened within the resource hours of OT i.e (9am – 3pm) 82.5% were planned surgeries, while 12.7% were unplanned ,

New OT 1 and OT 2 were the most utilized OT's in the resource hours i.e about 62 and 61 was utilized respectively. OT 4 was utilized for 59% followed by OT 1 which was used for 53%. OT 5 had the least utilization percentage with about 37.3%.

It clearly shows that the scheduling of the OT needs improvement. Operation theatre (OT) scheduling is essential for improving patient care outcomes, guaranteeing effective resource usage, streamlining hospital operations, and increasing overall operational efficiency. To optimize the use of OTs, reduce waiting times, and expedite the surgical process, effective scheduling entails carefully organizing and overseeing surgical processes.


Thank
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