

OT Utilization An Observational Study

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Salient Features Of Subject

Infrastructure

- Size of the hospital – 18,534 Sq. meters
- No of beds – 200 nos.
- No of bed ICU – 20 nos.
 - (15- SICU, 5 MIC)
- No of operational beds – 251 nos.
 - (Inclusive of Emergency & Day Care)
- Wards –
 - ❖ Cubical – (1st floor),
 - ❖ Surgical (2nd floor),
 - ❖ Emplaned ward (3rd floor),
 - ❖ General ward (4th floor),
 - ❖ Private & Semiprivate (6th floor),
 - ❖ Super deluxe & Deluxe (7th Floor).



Salient Features Of Subject

Talent

In Wards –

Nurses	– 219 nos.
Paramedical staff	– 70 nos.
Consultant	– 40 nos.
Resident medical officers	
❖ Resident doctors – 26	
❖ DNB's student – 20	

In Operations Theatre –

Consultant	
❖ Surgical Oncology – 9	
❖ Anaesthetist – 8	
DNB Surgical Oncology	– 7 nos.
Resident Surgical	– 1 nos.
Nurses	– 16 nos.
OT Technician	– 3 nos.
Anaesthesia Technician	– 3 nos.
Housekeeping	–



To evaluate the utilization of operation theatre at Bhagwan Mahaveer Cancer Hospital and Research Center, Jaipur.

Objective -

1. To find out the **OT utilization rate** at Bhagwan Mahaveer Cancer Hospital and Research Center, Jaipur.
2. To find out **bottlenecks** in the system, for proper and efficient utilization of OT.
3. To **suggests the remedial** measures to improve the OT utilization.

Why Is OT Utilization Important ?

- Operation Theatre services are a vital part of hospital and a key area of significant cost to the hospital services and therefore requires efficient utilization aiding higher productivity and efficient use of resources.
- Under utilization not only results in loss of revenue but also delays patient's treatment resulting in low level of patient satisfaction. This has a bearing on the overall image of the hospital.
- Enhancing the efficiency of operation theatre has always been a challenging process. This stream of life sciences has seen the biggest advancements; by the way of new procedures, techniques and practices.

SCOPE OF PROJECT

The observational study was undertaken in order to determine the following –

Identify the Problem Areas

Recommendations to Mitigate the Problems

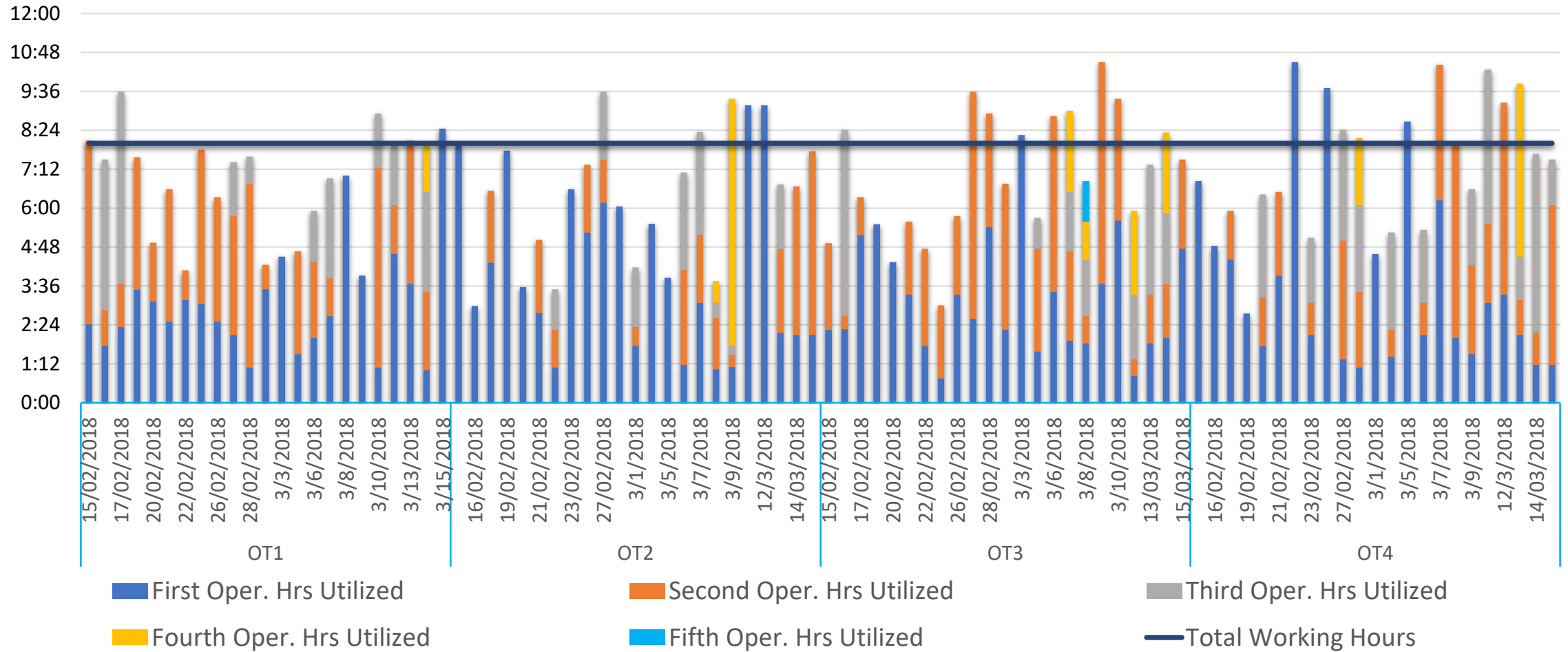
Material & Method

- Study Design: Prospective, Observational Study
- Setting: BMCHRC Operation Theatre Complex (OT1 – OT4).
- Sample Size : 205 cases (736 Functional Hours).
- Data Collection Procedure: Primary Data collected from observation and information gathered by discussion with staff.
- Secondary Data Collected from OT register and OT schedule list.
- Data Analysis Procedure: Microsoft Excel

Operation Theater Utilization

Current Status

OT Utilization TimeLine



Understanding the Current Status of OT Utilization

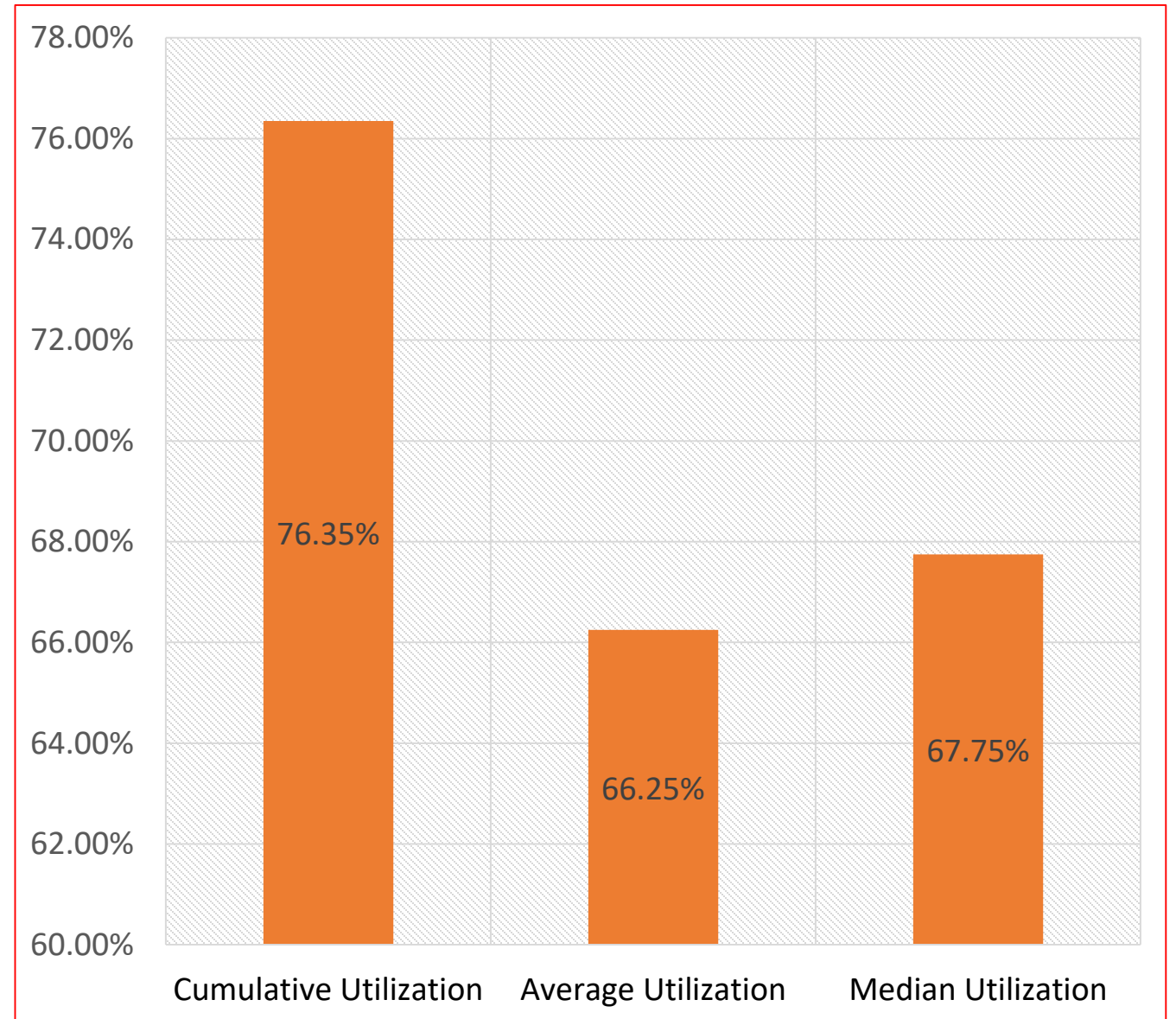
There are three bars each representing a mathematical computation for the operation theater utilization for understanding the current status accurately.

Cumulative Utilization – It is simple addition all the utilized hours against the available hours for the observed duration.

Average Utilization – It is a estimation to understand how many hours of operation theater was utilized in a day i.e. of eight hours available generally.

Median Utilization – It is an estimation that is done to remove the aberrations for the observed period. Aberrations for days when the utilization has been really low because of some practical reasons. But is not usually the case.

*Note – Overtime (OT utilized beyond working hours) is not considered for OT utilization computation.



Primary Understanding

- ✓ Each operation theater is utilized for an average of five and a half hour each-day. We have four functional theaters, so cumulatively we are not utilizing ten hours of operation theater a day. Which is similar to saying one Operation theater is not used each day.
- ✓ The median value in the graph on previous slide is higher than the average value which means that “low utilization” cases are ignored while calculating median. Since the difference between average and median values is one and half percentage points. Of the ninety two overall observation only two observations were ignored as outliers.
- ✓ Which brings us to the conclusion that the problem is systemic and not an aberrational or one off.

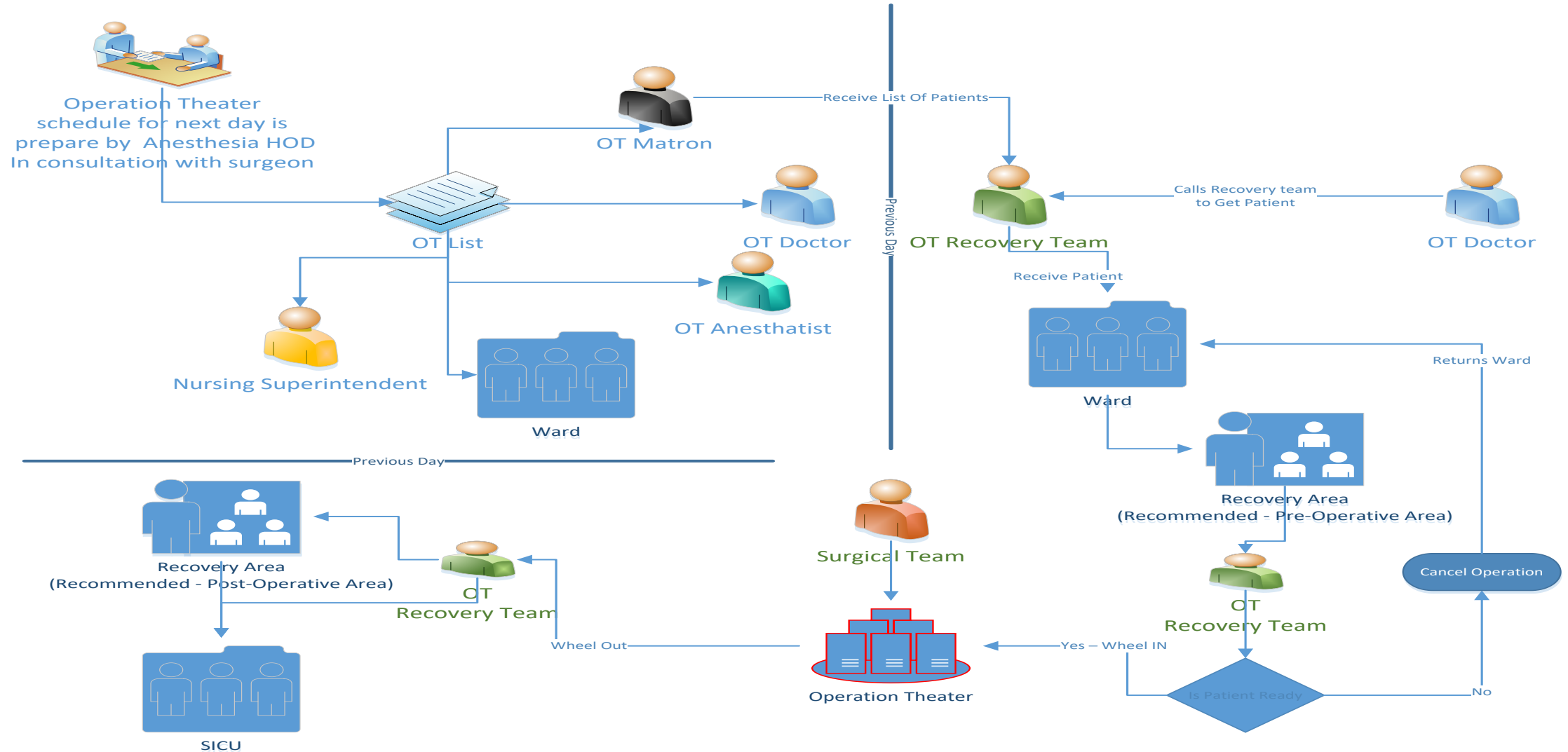
Operation Theater

Process Flow

Deep Dive for Operational Theater Working at Bhagwan Mahaveer Cancer Hospital and Research Center, Jaipur.

- ✓ First Task at hand is to get a complete understanding of the working process flow.
- ✓ Familiarize with the staff and their job requirements involved in the process flow.
- ✓ Understand the terminologies and the functional vocabulary used at hospital.

Operation Theater Scheduling & Utilization Process Flow

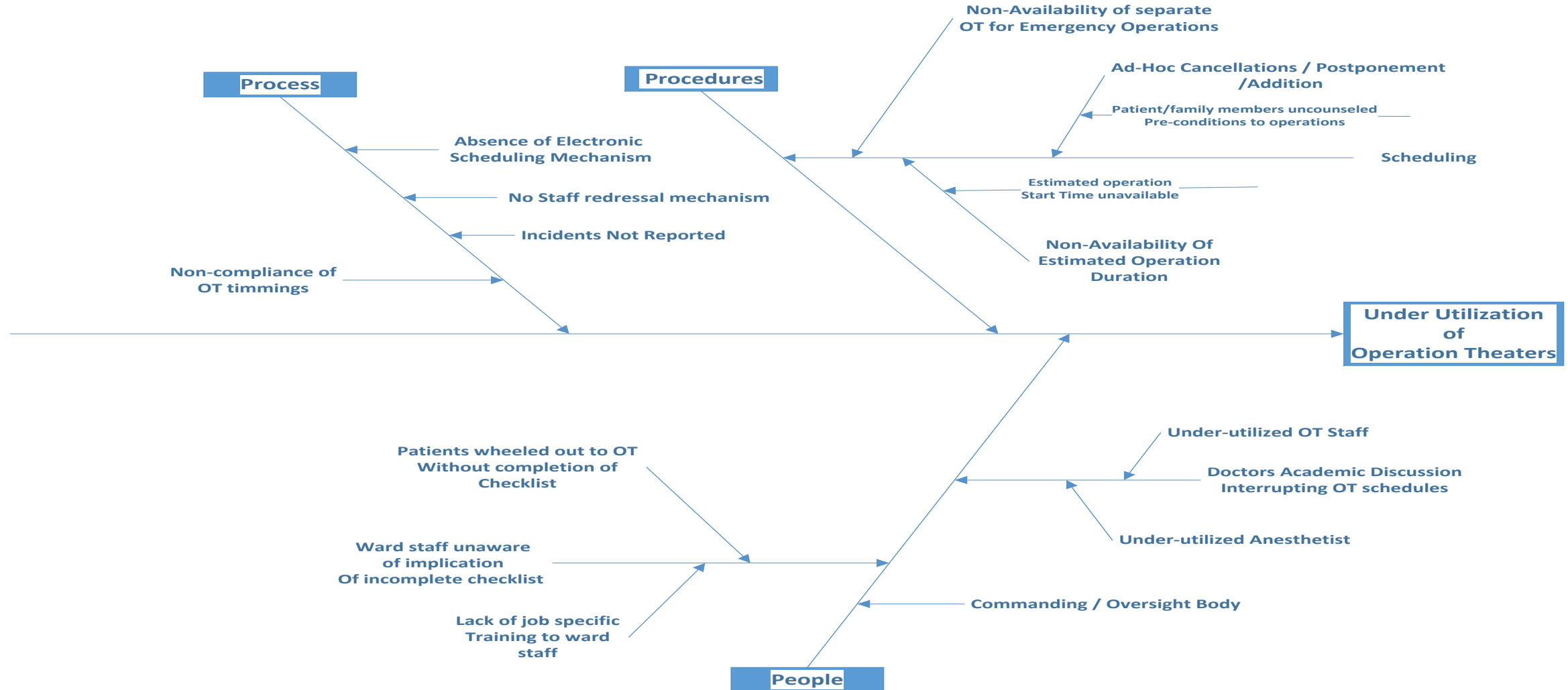


Deep Dive for Operational Theater Working at Bhagwan Mahaveer Cancer Hospital and Research Center, Jaipur.

In Continuation..

- ✓ Once the familiarity with the process flow is achieved..
- ✓ We draw the fish bone diagram to try to shortlist the areas of concern in the process

Fish Bone



Analyzing Fish Bone

Section 1 – Two bones Procedures & People

Understanding Bottlenecks-

- Schedules are not followed **Diligently**.
- Though Flexibility in any process is desirable. It should not be at the cost of efficiency.
- The endeavor in the following slides is to understand by quantifying each and every reason on the bone of the process & people by validating it with data compiled during the observed period.

Fish Bone Section 1

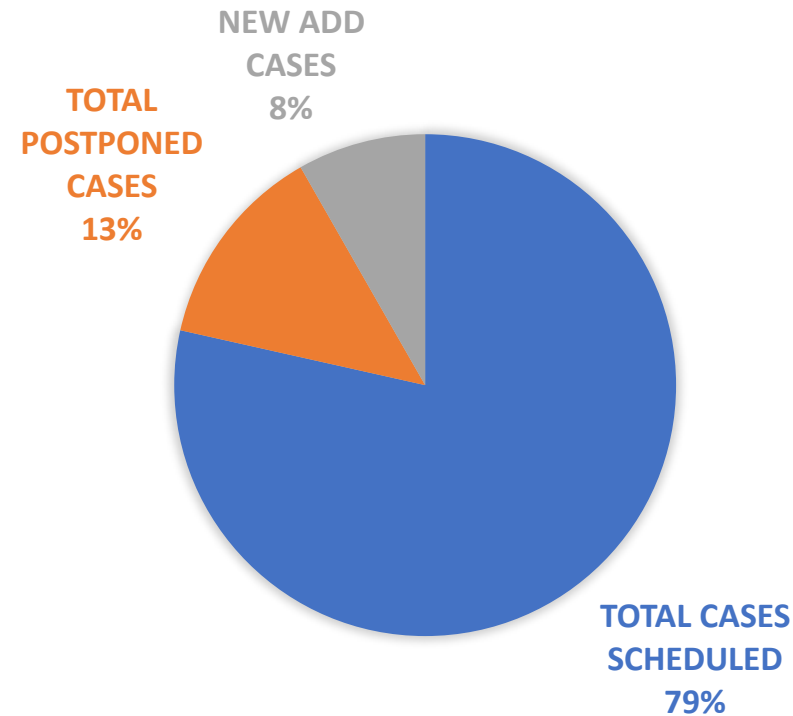
Postponements / Additions –

The following graphs typically depicts the number of interruption we had in the normal working of the operation theater schedule.

So numerically speaking of the 205 operations were done during the observed that is 30 cases are postponed and 20 new cases are added.

Again here these might be due to various genuine reasons such as emergency cases; that the postponement of scheduled operations occurred. But since we do not have incident reports it's not possible to evaluate the reasons accurately.

The important learning is that there is disruption in the regular smooth flow due to postponements and the addition of new cases. Leading to time overruns.



Fish Bone Section 1 Continued..

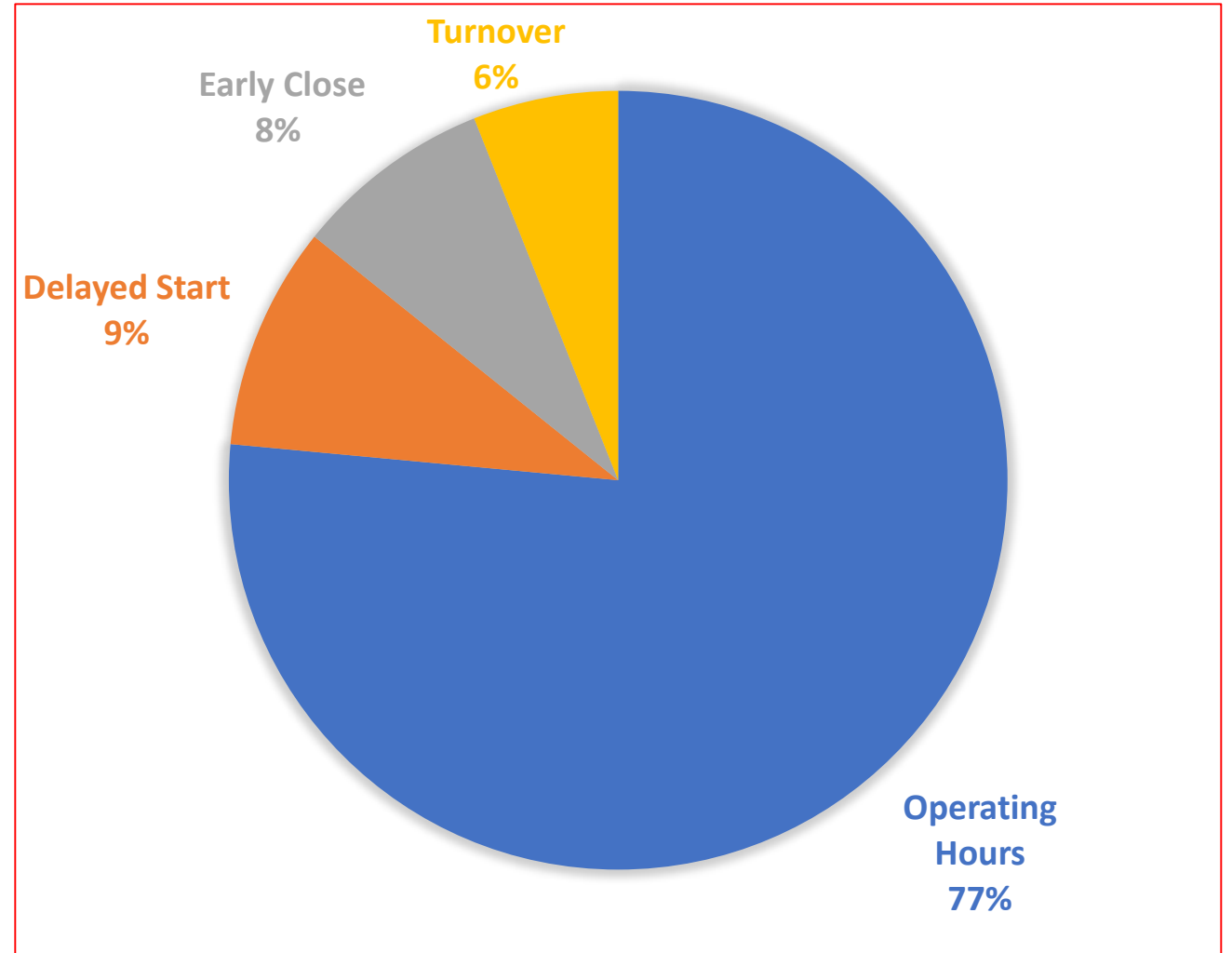
Quantifying Time seepage –

The following graph typically depicts the loss of hours due to various reasons in the daily operation theater working.

To elucidate further, of the 736 working hours observed; we have not utilized total 173 hours for the various reasons shown.

The Chief contributing factors for this is –

- Doctor meeting schedule overlap with Operation theater working timings.
- Addition and postponement leave the support staff totally unprepared leading to delayed start and higher turnaround time.



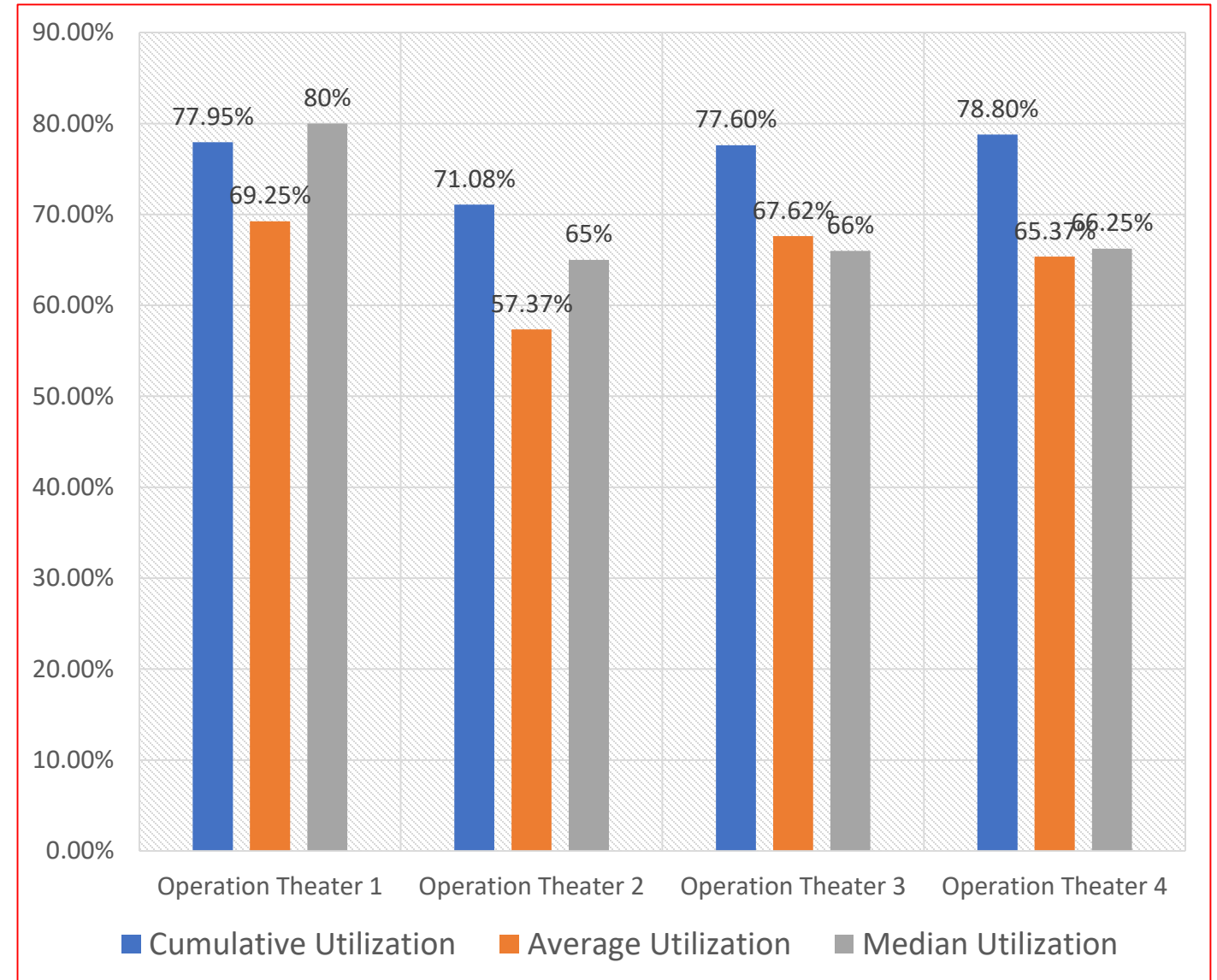
Fish Bone Section 1 continued...

Deep Dive in Time seepage by each OT –

OT1 & OT2 show a differential between average and median equivalent to 10 - 8 percentage points. Where the median is higher; which means that number of outliers having low utilization is high and is not consistent. Hence when we calculate the average it is depressed.

OT3 shows Median is lower showing that high utilization is an outlier and happens some time as the difference between the two is just 1 percentage point and the OT is consistently under utilized and hence the median is lower than average.

OT4 shows that they are consistent but also under utilizing. So also there are no aberrations to this pattern which means they are pretty good with scheduling.



Understanding Bottlenecks-

- The above observations make it pertinent for us to dig in deeper, and try to understand where is the loss of time occurring.
- Hence we plot a bubble chart to quantify which are the instances where time seepage is most evident and which are the instances which need to be addressed on the priority basis.
- In the following bubble chart we put size of the bubble as the most number of operations performed; because those are the instances where the value of the time seepage becomes prominent.

Fish Bone Section 1 continued...

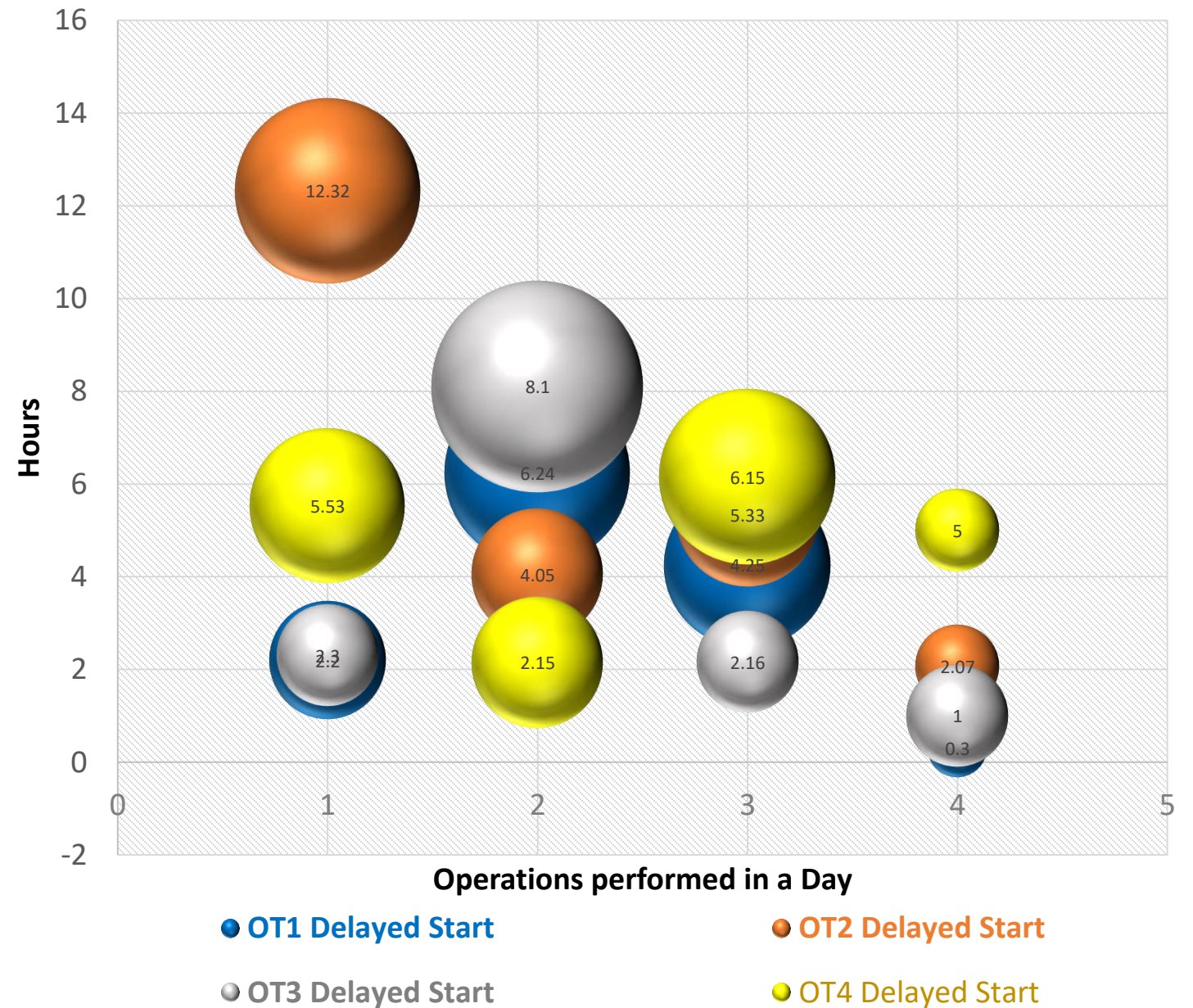
Delayed Start Time Seepage –

OT1 has almost evenly distributed number of 2-3 operations scheduled for a day where the delayed start is effecting the overall performance.

OT2 has maximum number of 1 operations scheduled for a day where the delayed start is an issue.

OT3 has maximum number of 2 operations scheduled in a day where delayed start is an issue.

OT4 has maximum number of 3 operations scheduled in a day where delayed start is an issue.



Fish Bone Section 1 continued...

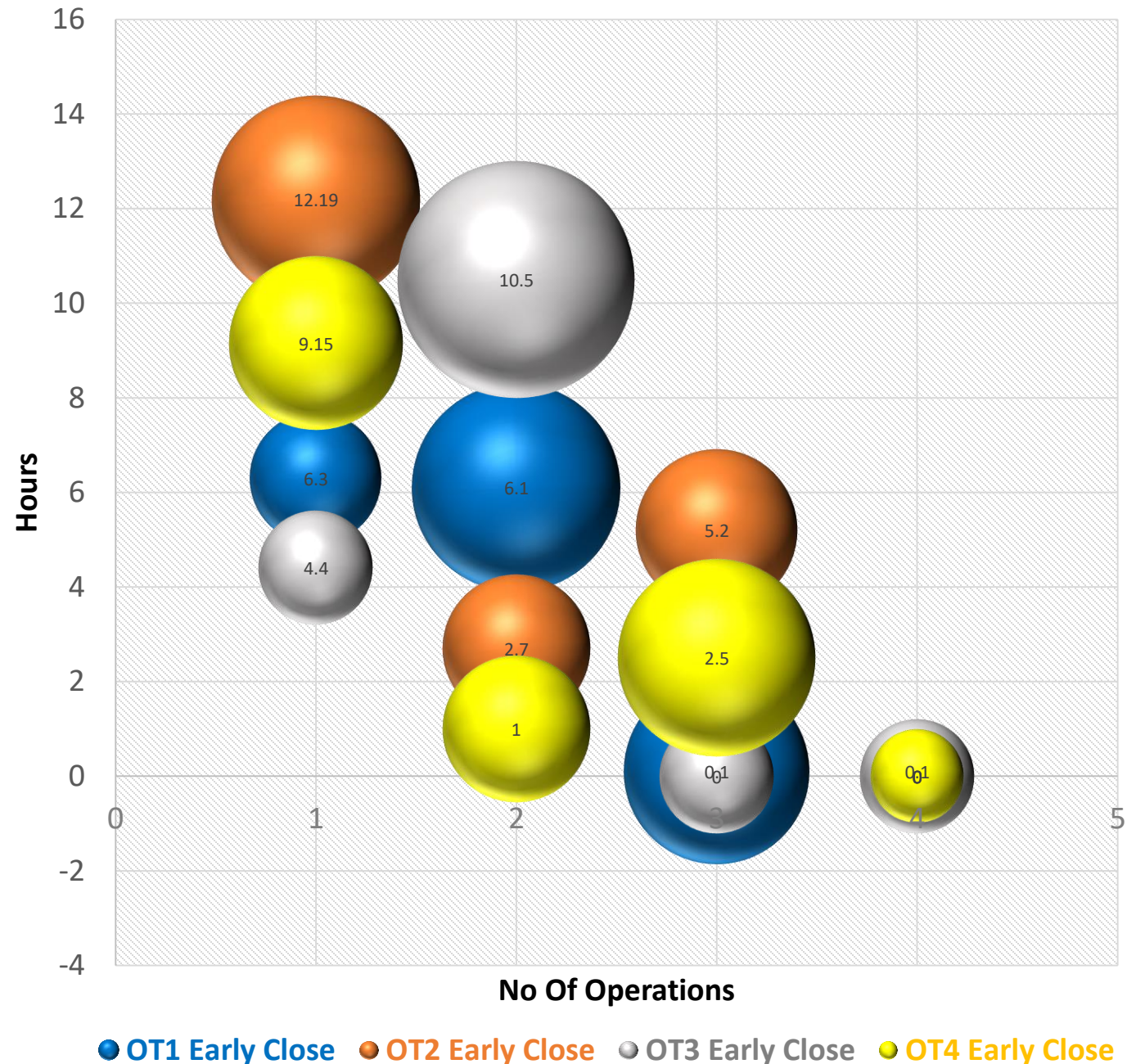
Early Close Time Seepage –

OT1 has almost evenly distributed number of 2-3 operations scheduled for a day but it is only when we have 2 operations that they are closing early and is effecting the overall performance.

OT2 has maximum number of 1 operations scheduled for a day where the early closing is an issue.

OT3 has maximum number of 2 operations scheduled in a day where early closing is an issue.

OT4 has maximum number of 3 operations scheduled in a day but its whenever they have 1 operation scheduled they are closing early.

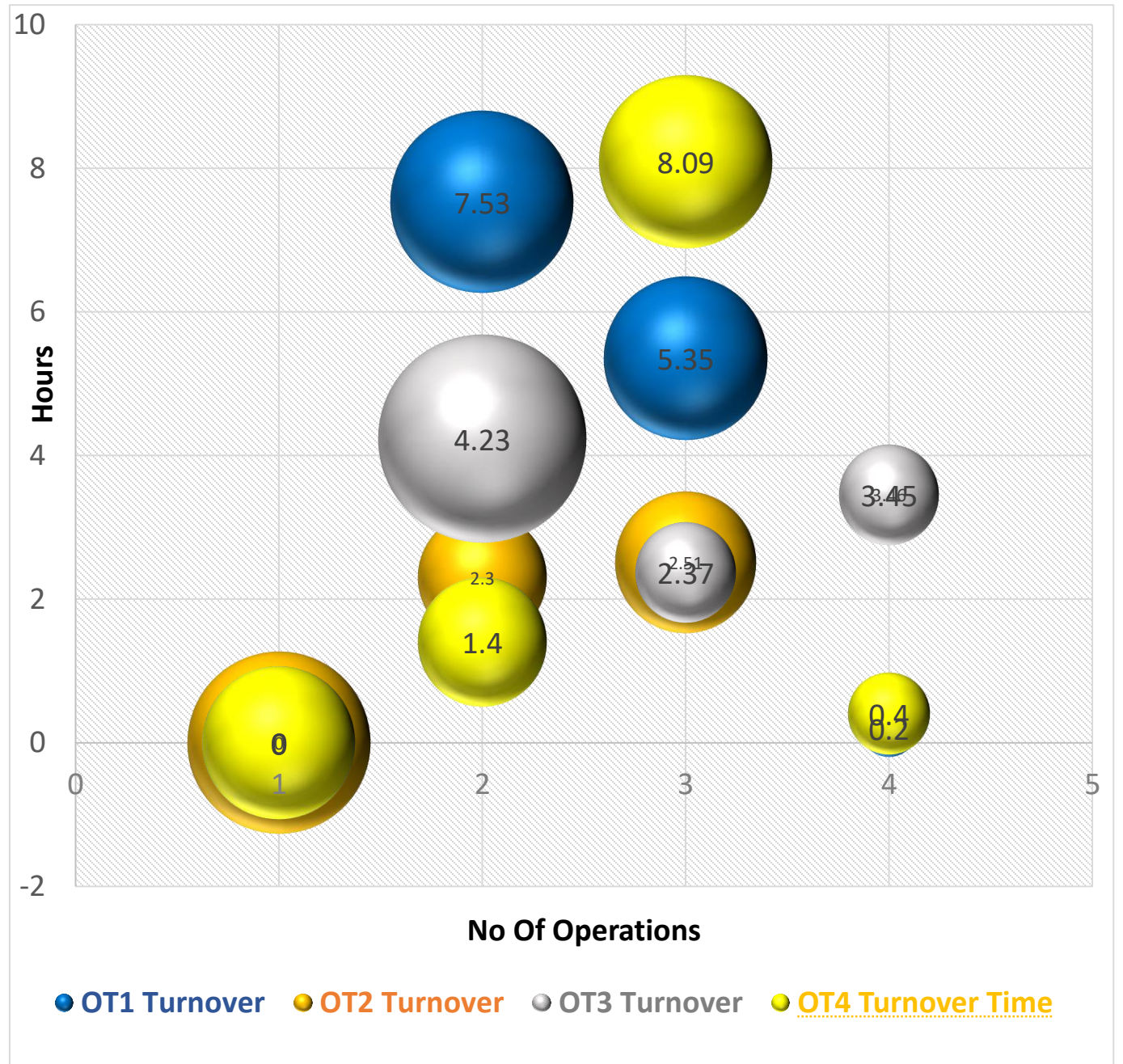


Fish Bone Section 1 continued...

Turnover Time Seepage –

Turn around time is the time needed to wheel out a patient , clean the operating theater and to wheel in the new patient.

All the OT's show inconsistency in the amount of time taken between operations.



Analyzing Fish Bone

Section 2 – Processes

Fish Bone Section 2

Electronic Scheduling –

This absence of electronic scheduling process , results in following –

- ❖ Lack of transparency in scheduling,
- ❖ Subject to human errors,
- ❖ Leaves the concerned ward staff, administration with little or no time for adjustments, corrective measures,
- ❖ Difficult to synchronize with surgeons, anesthetists and technicians leave or absence.

Fish Bone Section 2 continue..

Staff Redress Mechanism

The staff's knowledge gained with experience and corrective measures are not headed, which results—

- ❖ Staff feels disfranchised,
- ❖ Loss of commitment,
- ❖ Repetitive errors.

Redress tool is an effective mechanism to fine tune the existing process and procedures.

Fish Bone Section 2 continue..

Doctors Academic Discussions

While no one disputes the importance of learning from one others experience, the gains remain professional specific because of following reasons –

- ❖ The schedule interrupt with the regular working,
- ❖ Loss of the operating theater hours,
- ❖ Ideal hours for the OT support staff.

Recommendations & Their Implications

Section 2 – Processes

Implementation Of Electronic Scheduling

Implementing the Electronic scheduling will have compounding impact on the overall working of the operation theatres. Some of the high points are mentioned here in –

- Variable OT room access (set aside time to accommodate historical add ons w/o disrupting elective schedule).
- Accurate case duration estimates.
- Visual dashboards in preoperative area enable real time patient tracking and status update.
- Leveraging real time data captured from automated workflow allows the use of analytics to measure, sustain & improve surgical efficiency and clinical quality as well as quantify success against key performance indicators such as – Block utilization, Prime time utilization, cancellation rates, first & subsequent on time start, turn over time, patient safety metrics.
- Preoperative work ups including consultations, tests, and labs to be built in electronic check lists where items required to be completed before the day of surgery admission can be monitored for the completion. This eliminates the risk of day of surgery cancellations, staff can look for incomplete preops.

Implementation of Trainings Programs

- Time Management trainings for the doctors and OT staff. This will result in change in mind-set to highlight the importance of OT utilization.
- Financial Orientation trainings for the doctors, surgical ward staff. This will make them aware and appreciative of the management austerity measures and the reasons for it.
- Job oriented technical trainings for all ward staff / OT staff.

Thank You

Questions are welcome.