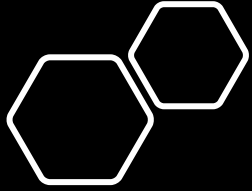


EXPLORATORY STUDY ON TRENDS AND COMMENCEMENT STATUS OF SURGERY IN OT OF MAX HOSPITAL, GURUGRAM

Submitted by:
Shivani Shakti Rao
MBA-HOM-24
Roll no-0995





Introduction

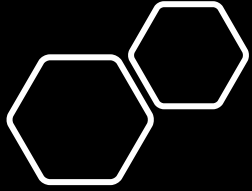
- OT being most crucial as epitomises significant amount of budget in hospital
- Maximum admissions are done for surgical interventions.
- OT is the heart of hospital~ requiring both human resource and financial support
- Developing countries have reported disruption which are majorly due to preventable & avoidable reasons
- Variations in normal process flow leads to delay in start time of surgery, early start time, cancellation or postponed or done on some another day.
- If not prevented, then these increases the overall cost, increases the workload, poor patient satisfaction score and hospital's reputation is questioned.
- Thus, need to devise solution to such problems encountered; study on exploring the trends which are undesired and acts as barrier are needed to be observed.
- Improving OT efficiency will lead to many positive aspects which may include reducing overtime pay to staff, revenue increase, less waiting time for patient and improved patient satisfaction

Research Questions

- Is there any change in scheduled timings for commencing of planned surgeries in Max Hospital, Gurugram, Haryana?
- What are the trend of surgery being operated in Max Hospital, Gurugram, Haryana?

Objectives

- To identify pre-operative waiting time of planned surgeries in Operation Theatre.
- To assess the status of planned surgeries in terms of rescheduling, cancellation & associated departments.
- To determine the status of unplanned surgeries & associated departments in terms of emergency cases.

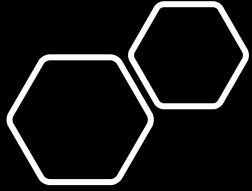


REVIEW OF LITERATURE

- Studies published worldwide which explains the different reasons, trends, and causes affecting the efficiency of OR have been reviewed
- Studies published after 2005 are included in the literature review.
- 40+ studies were reviewed for identifying the similarities and associated reasons.

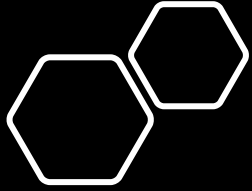
S.no	Author	Year	Study Location	Sample size	Sampling technique	Conclusion
1.	Delay of Surgery Start Time: Experience in a Nigerian Teaching Hospital [1]					
	<u>Chike John Okeke, Chukwudi Ogonnaya Okorie, Rufus Wale Ojewola, Njoku Isaac Omoke, Anselm Okwudili Obi, Agama Nnachi Egwu, and Okechukwu Valentine Onyebum</u>	2020	Nigerian teaching hospital	1178	Prospective observational	Most of the delays are preventable. Attitudinal change by all theatre users, good inter-departmental communication, universal health insurance, operative check list, dedicated specialty theatres, preoperative anaesthetic clinic, and regular auditing of hospital equipment will go a long way in mitigating these delays.
2	Cancellation of operations on the day of intended surgery at a major Australian referral hospital [2]					
	William N Schofield, George L Rubin, Michael Piza, Ying Yin Lai, Dounkamol Sindhusake, Michael R Fearnside and Peter L Klineberg	2005	Major metropolitan tertiary hospital,	7913	Prospective survey.	This study found that 11.9% of all scheduled operations (including emergency operations), and 13.2% of elective operations scheduled for weekdays, were cancelled on the day of surgery. Investigation revealed five major reasons for these cancellations, with similar frequencies: “procedural reasons”; no theatre time due to over-run of earlier surgery; lack of a postoperative bed; patient cancellation or failure to present; and patient clinical or diagnostic change.
3.	Improving operating room efficiency through process redesign [3]					
	<u>Maureen Harders Mark A.Malangoni Steven Weight Tejbir Sidhu</u>	2006	Medical college		prospective	Demonstrated that a coordinated multidisciplinary process redesign can significantly reduce NOT (room turnover time plus anaesthesia induction and emergence time). This process is applicable to most ORs and has optimal benefit for cases of 2 hours or less in duration
4.	Communication in the operating theatre [4]					
	S.-M. Weldon, T. Korkiakangas, J. Bezemer and R. Kneebone				Systematic review	Interprofessional communication plays an essential role in information transfer during operations and has relevance to patient safety5–8. The professionals working on operations include surgeons, anaesthetists, operating department practitioners and nurses, as well as surgical trainees, medical and nurse students.

S.no	Author	Year	Study Location	Sample size	Sampling technique	Conclusion
5	Audit of operation theatre utilization in general surgery [5]					
	K. Vinukondaiah, n. Ananthakrishnan, m. Ravishankar	2000	J.I.P.M.E.R. Pondicherry	1773 cases	Audit Prospective observation al study	Delay in starting lists, under-scheduling, interruption due to emergency surgeries, administrative reasons, induction of anaesthesia and recovery policies are the main factors that account for inefficient use of operating facilities. The correction of these factors would increase the available operating time by nearly 20%.
6	LEAN THINKING: AN INITIATIVE TOWARDS PROCESS IMPROVEMENT IN THE OPERATION THEATRE DEPARTMENT [6]					
	Monika Sonu	2016	Tertiary care hospital in India			The study provided evidence-based facts that Lean management applications in the surgical department settings helped in minimizing delays and non-value-added activities, hence making the system more robust and efficient. The efficiency of the operation theatre department has a direct impact on the level of service provided to the patients. The major concern in the operation theatre department of any healthcare set up is to minimize the perioperative delays in the processes and reduce errors and communication gaps.
7	A Theatre Time Utilization Survey in a University Teaching Hospital from a Developing Country [7]					
	Kehinde S. Oluwadiya, Babatunde B. Osinaike, Amogu K. Eziyi , Emmanuel O. Oyebamiji and Israel K. Kolawol	2012			Prospective observation al study	Study showed a high rate of delays of OR procedures. Many of these delays were avoidable and could have been minimized by a more effective utilization of OR time and schedule. More than one-third of the cases experienced delays in transferring patients to the theatre. The hospital layout could have contributed to some of these delays because some wards are far from the theatre that even if there was no delay in the ward, it would still have taken about 15 minutes to go and come back from them.



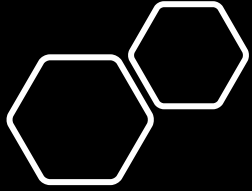
METHODOLOGY

- **Setting-** 72 bedded Max Hospital, Gurugram, Haryana- OT complex 3 OR (including 1 septic OR) are used, while the 4th for emergency use.
- **Population-** surgical intervention patients February and March 2021
- **Size-**699 patient's data (300 + 399 patient's for Feb and March resp.)
- Retrospective exploratory study
- **Data collection source-**
- Data obtained from registers, patient's file, Max HIS & CPRS.
- To know the reasons associated, questionnaire-survey was filled by OT staff.
- **Analysing Tool-** questionnaire and data via HIS was analysed using Microsoft Excel.



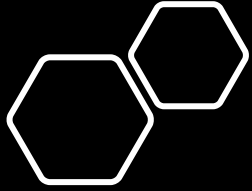
Ethical considerations

- This study was approved, and permission was given by the Hospital administration of Max Hospital, Gurugram
- Privacy and concealment of identity have been maintained all the time and information is reported anonymously so that none of the identity is disclosed.
- Patients' name, I.P. number are not recorded during any processes of data collection.
- During questionnaire filling, a consent was signed prior to form filling which states proper privacy and confidentiality concerns
- None of the IP addresses and email ID are not tracked nor stored for future references.



Statistics for Feb and March, 2021 in Operation Theatre, Max Hospital, GGN

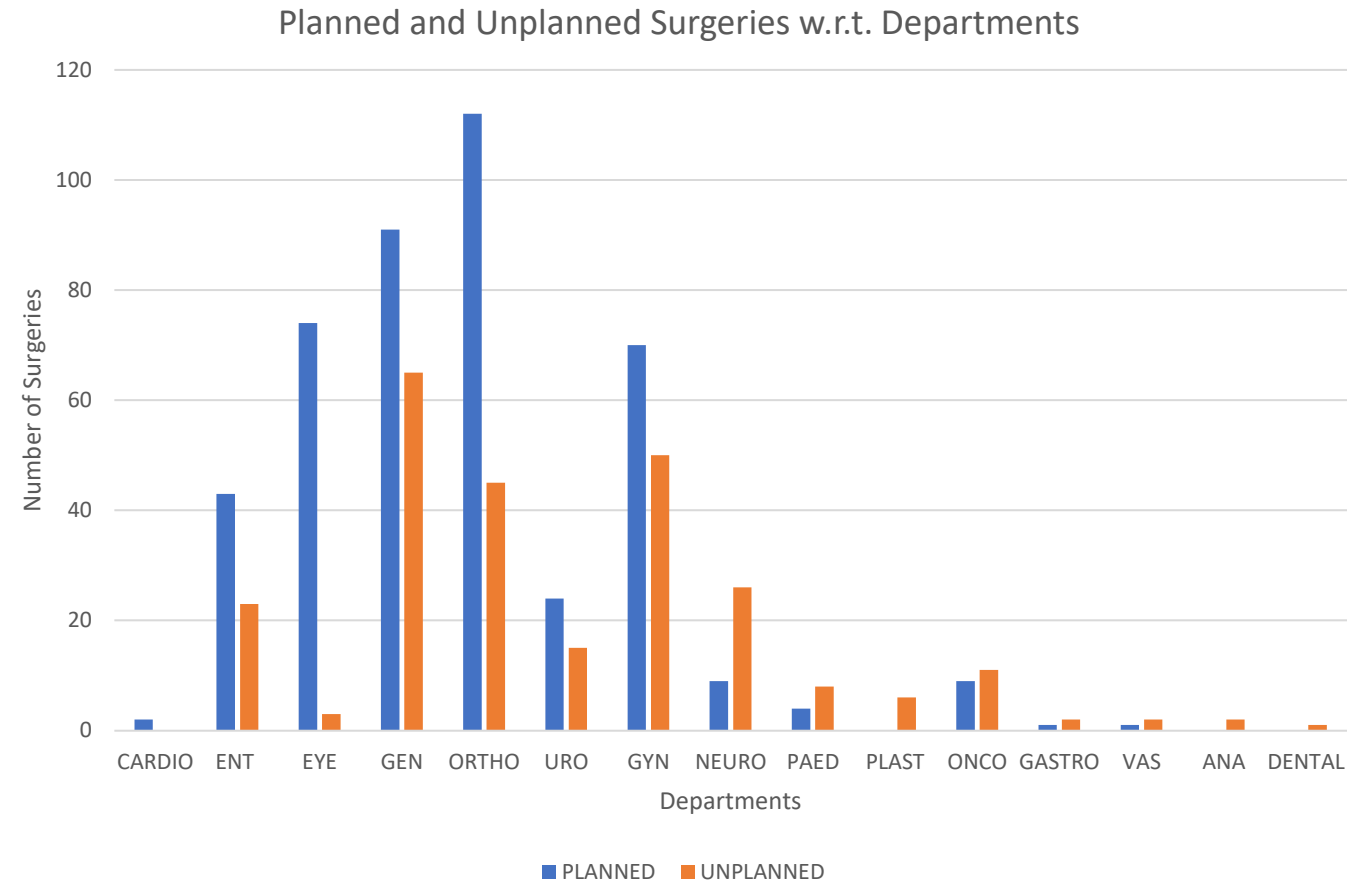
Category	FEB	MARCH
Number of Planned Surgeries	192	248
Number of Unplanned Surgeries	107	152
Number of Cancellations	42	37
Total Cases (planned & unplanned)	299 (258 cases done & 2 not recorded)	401 {363 cases done & 18 not recorded (March 30)}
Department with Maximum Number of Surgeries	Orthopaedic	Gen Surgery
Department with Minimum Number of Surgeries	Oncology	Dental, Vascular, Cardiac
Maximum Number of Cancellations	11 (Orthopaedic)	11 (Gen. Surgery)



Planned and Unplanned Surgeries

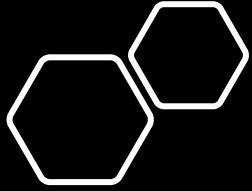
N=699

- Planned cases= 440
- Unplanned cases= 259



Number of planned and unplanned cases in month of February and March 2021.w.r.t Departments

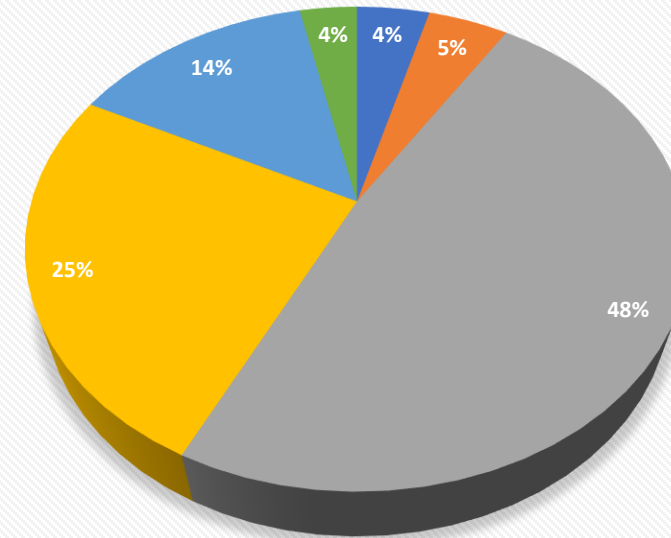
ORIF and Lap cholecystectomy were maximum planned surgery.
Lap cholecystectomy was the surgery which was highly unplanned .



Status of Planned Surgeries



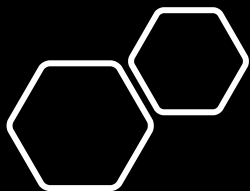
Status of Planned Surgeries



■ not recorded ■ on time ■ delay ■ early ■ not done ■ postponed

Pie chart showing the status of planned surgeries for month of February and March 2021 in terms of delay start, early start, on time surgeries, not documented properly, did not happen and postponed surgery.

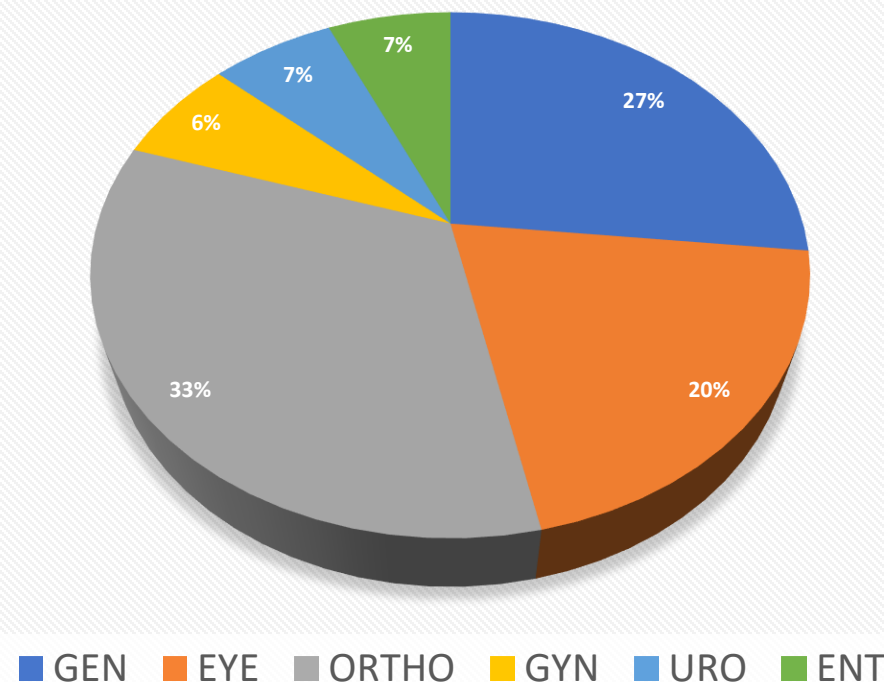
	N~440
Delay start	215
Early start	112
Not done	63
Postponed	15
On time	21



Postponed Surgeries out of Planned Surgeries



Surgeries postpone w.r.t. Departments

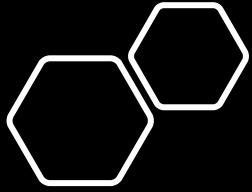


Pie chart showing the surgeries which are postponed w.r.t departments

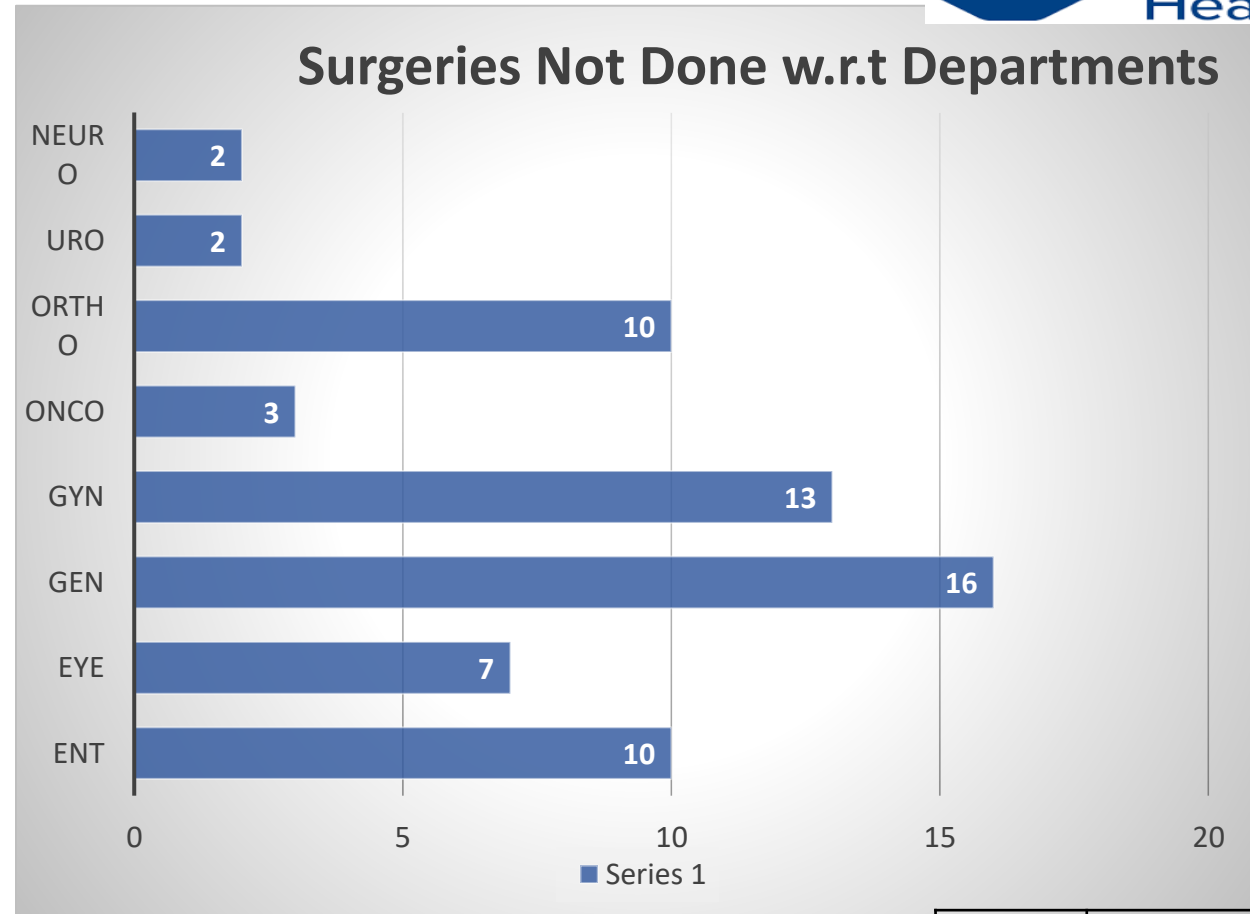
N= 15/440 planned surgeries

Total Knee Replacement being mostly postponed in Orthopaedic.

Postponed	15
GEN	4
EYE	3
ORTHO	5
GYN	1
URO	1
ENT	1



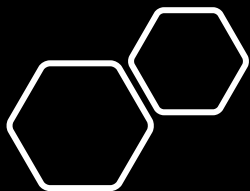
Surgeries not done out of planned surgeries and associated department



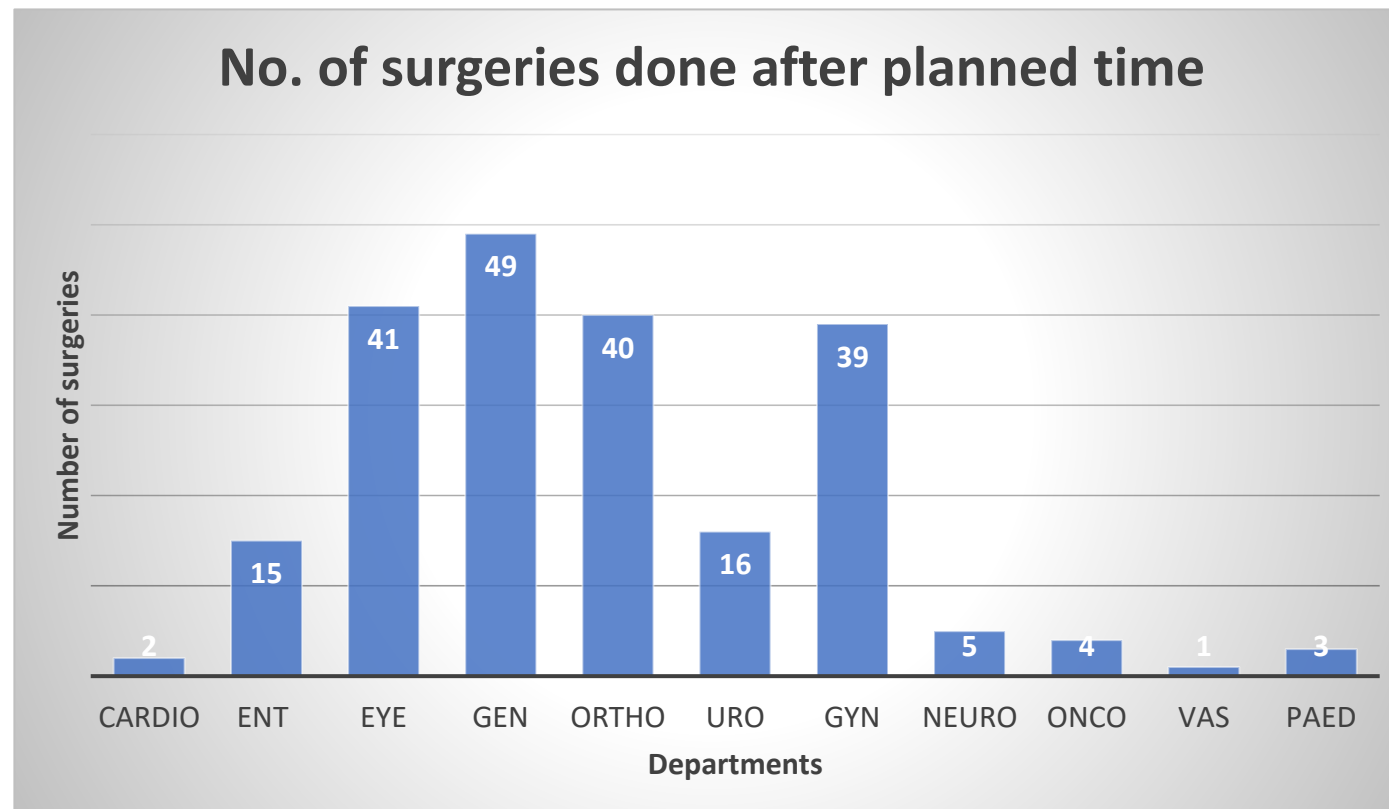
N=63/440

General surgery (25 % of planned cases) had high count and Lap Cholecystectomy was the surgery which was not done in general surgery.

DEPTT.	Not done surgeries	%
ENT	10	16
EYE	7	11
GEN	16	25
GYN	13	21
ONCO	3	5
ORTHO	10	16
URO	2	3
NEURO	2	3



Surgeries done after planned time out of all planned surgeries



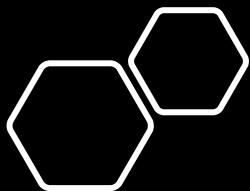
Number of planned cases done after planned time w.r.t Departments in month of February and March 2021.

N= 215/440

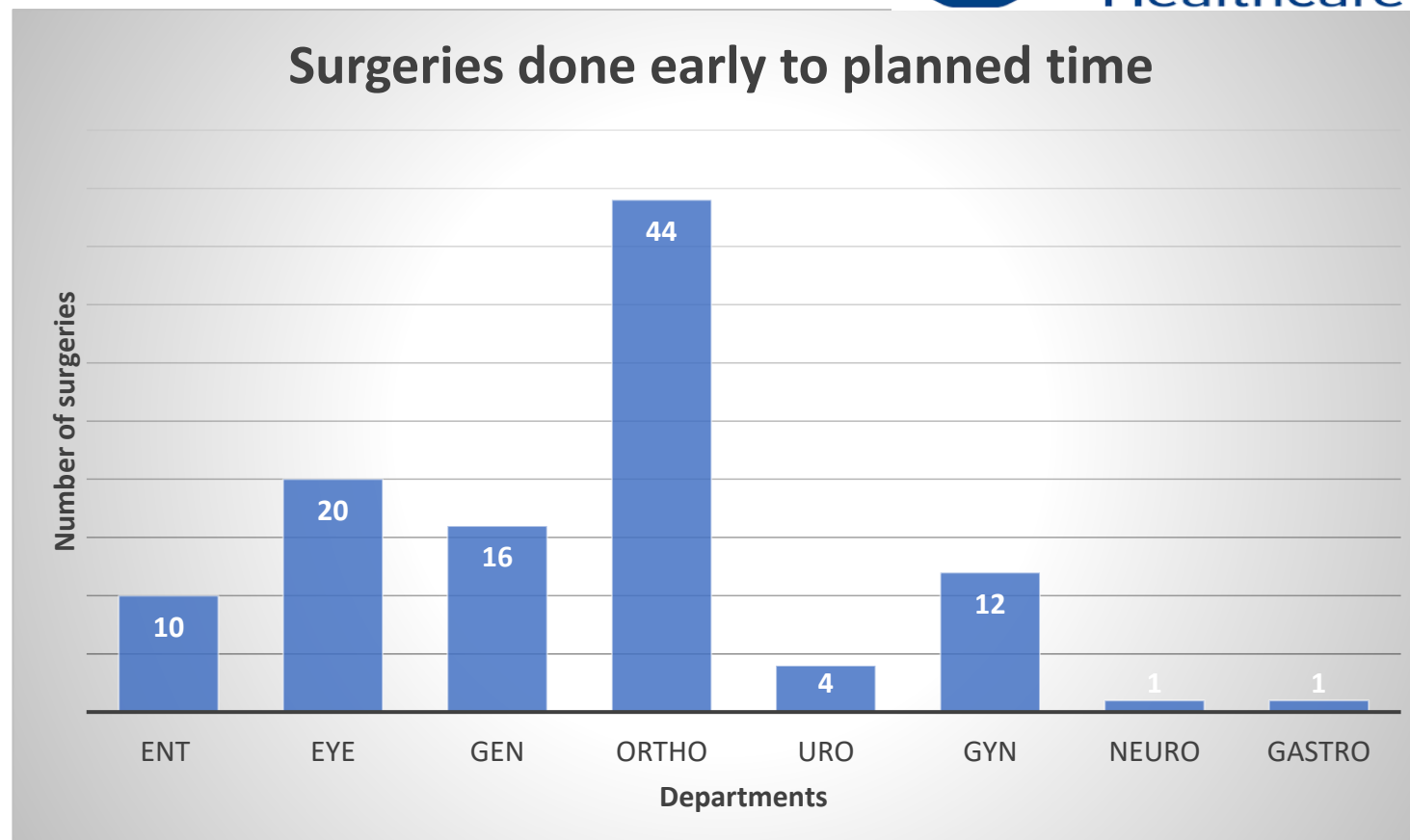
General surgery (23%) followed by Ophthalmology and orthopaedics.

Were the department with maximum number of delays

Lap cholecystectomy was mostly delayed than their usual planned time.



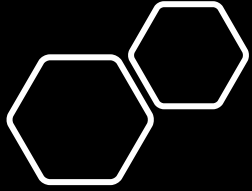
Surgeries done before
planned time out of
all planned surgeries



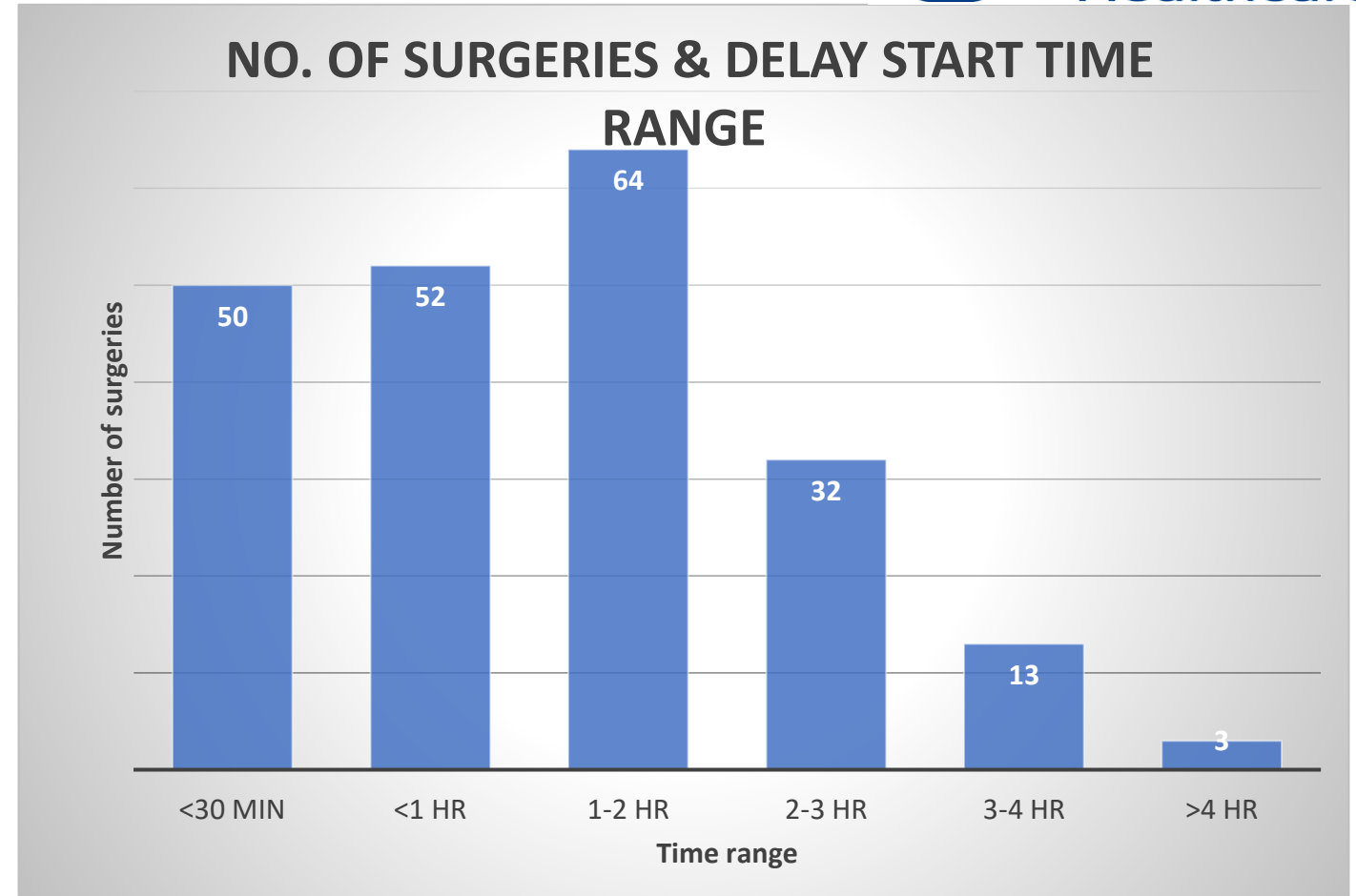
**Number of planned cases done before planned time w.r.t
Departments in month of February and March 2021**

N= 112/440

Orthopaedic had the maximum proportion (41% of all planned surgeries) Out of all 440 planned surgeries, only 4% of surgeries started on time of what was planned for their commencement.



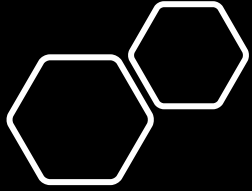
SURGERIES & RELATED DELAY START TIME RANGE



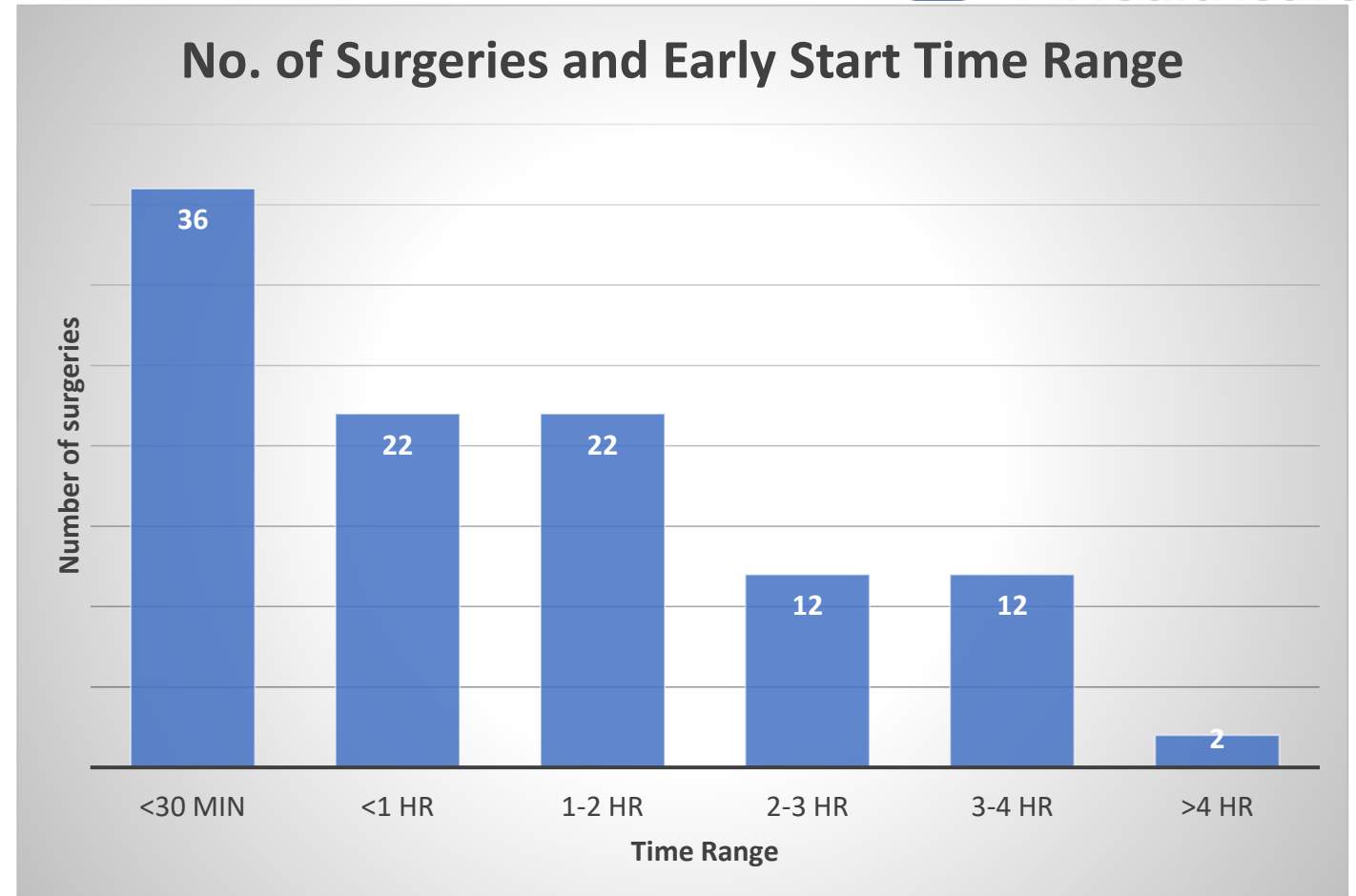
Number of planned cases done after planned time and delayed time range in month of February and March 2021.

N= 64/440

Orthopaedic and Ophthalmology are the departments with highest proportion of delays. Maximum delay went to late start of 4-5 hours of range (Orthopaedic)



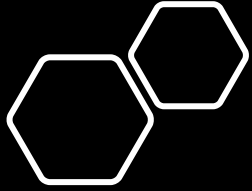
Surgeries and their Early Start Time Range



Number of planned cases done before planned time and early time range in month of February and March 2021

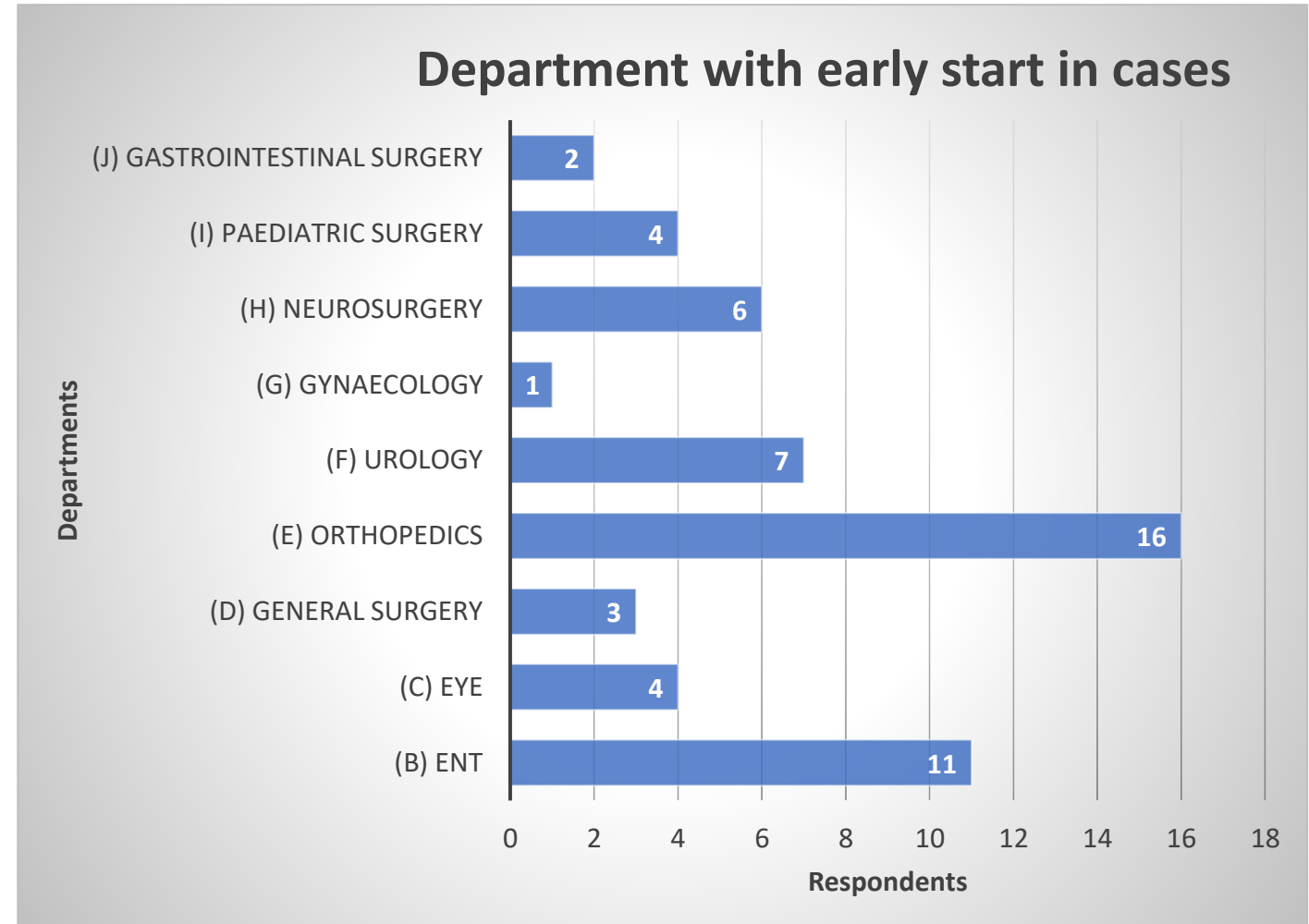
N=106/440

Orthopaedic were the department whose surgeries started before time of planned time



REASONS FOR DELAYS IN OR

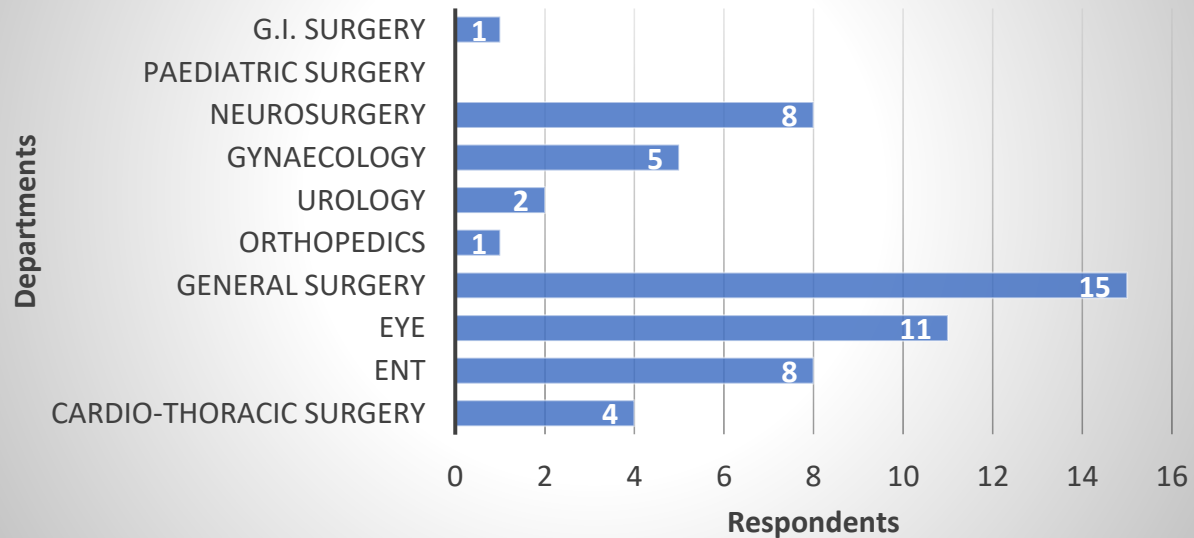
- 25 staff members out of 30 filled the questionnaire and average had 5-10 years of experience in OR.
- 95% respondents experienced changes in commencement timings of cases. 84% respondents answered that delays were commonly experienced in OR. 16% experienced early start of cases.



**Response of OT staff regarding departments w.r.t
early start in surgery.**

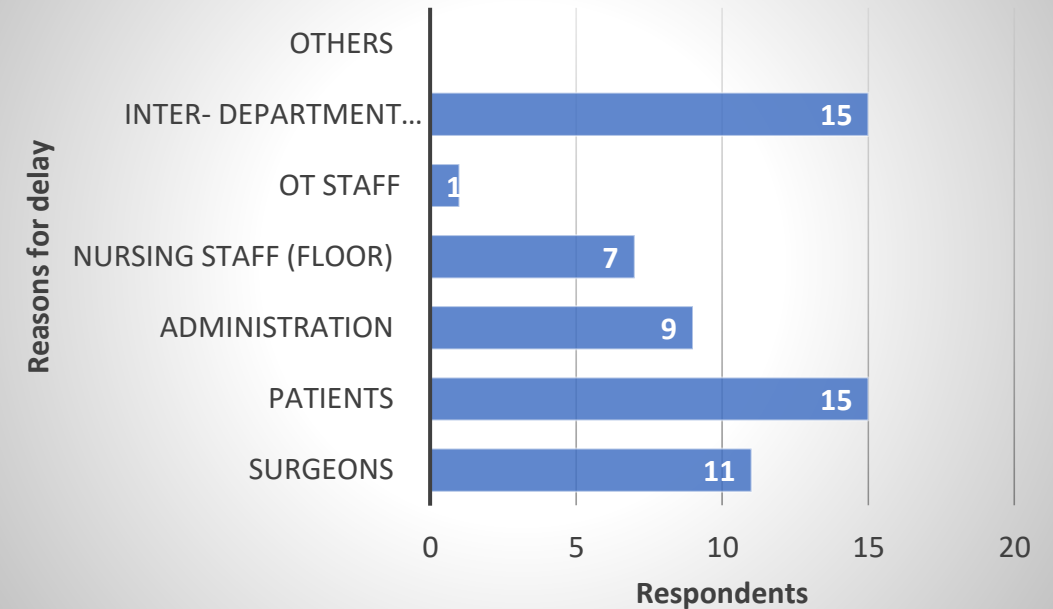
Department and Reasons for Delay Start of Surgeries

Department with Late start in surgical cases



Response of OT staff regarding departments w.r.t delay start in surgery.

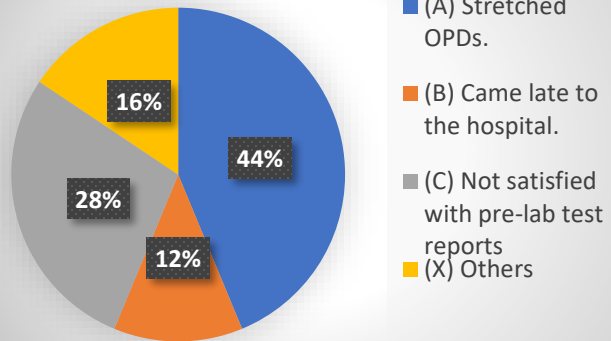
Reasons for late start of cases



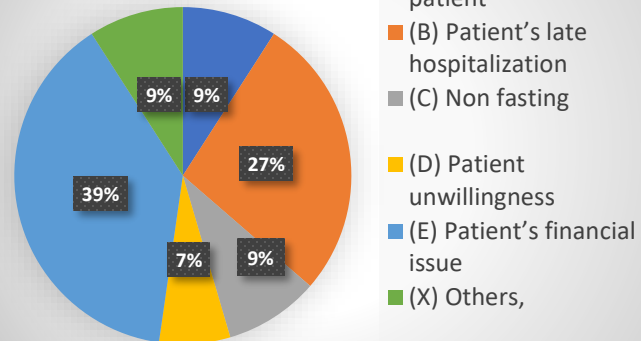
Response of OT staff regarding reasons for delay in surgery

Reasons for Delay Start of Surgeries

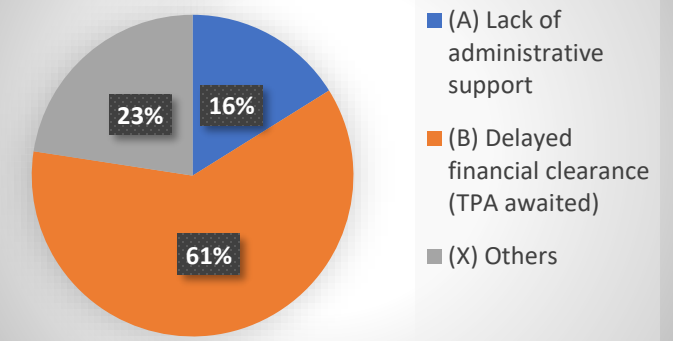
Surgeon related reasons for delay



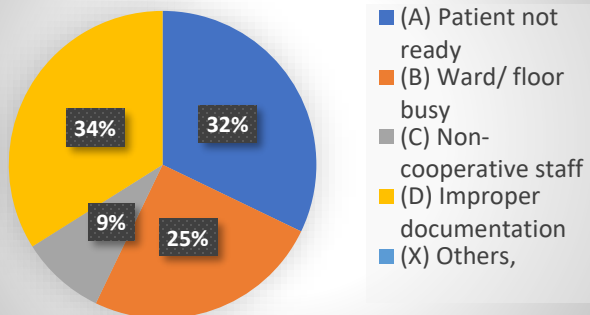
Patients related reasons for delay



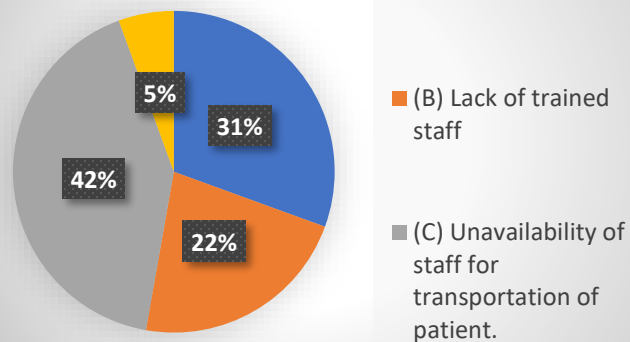
Administrative related reason for delay



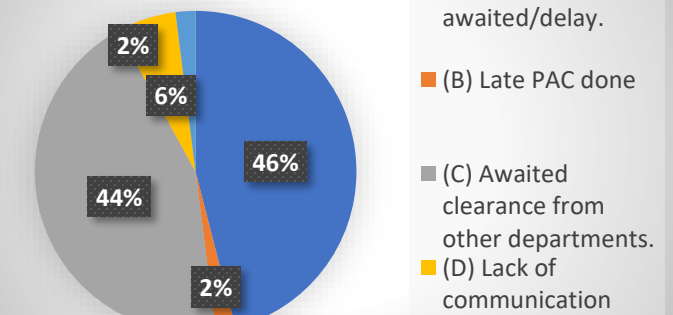
Floor Nursing related reason for delay

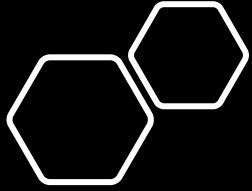


OT / OT staff related delay reason

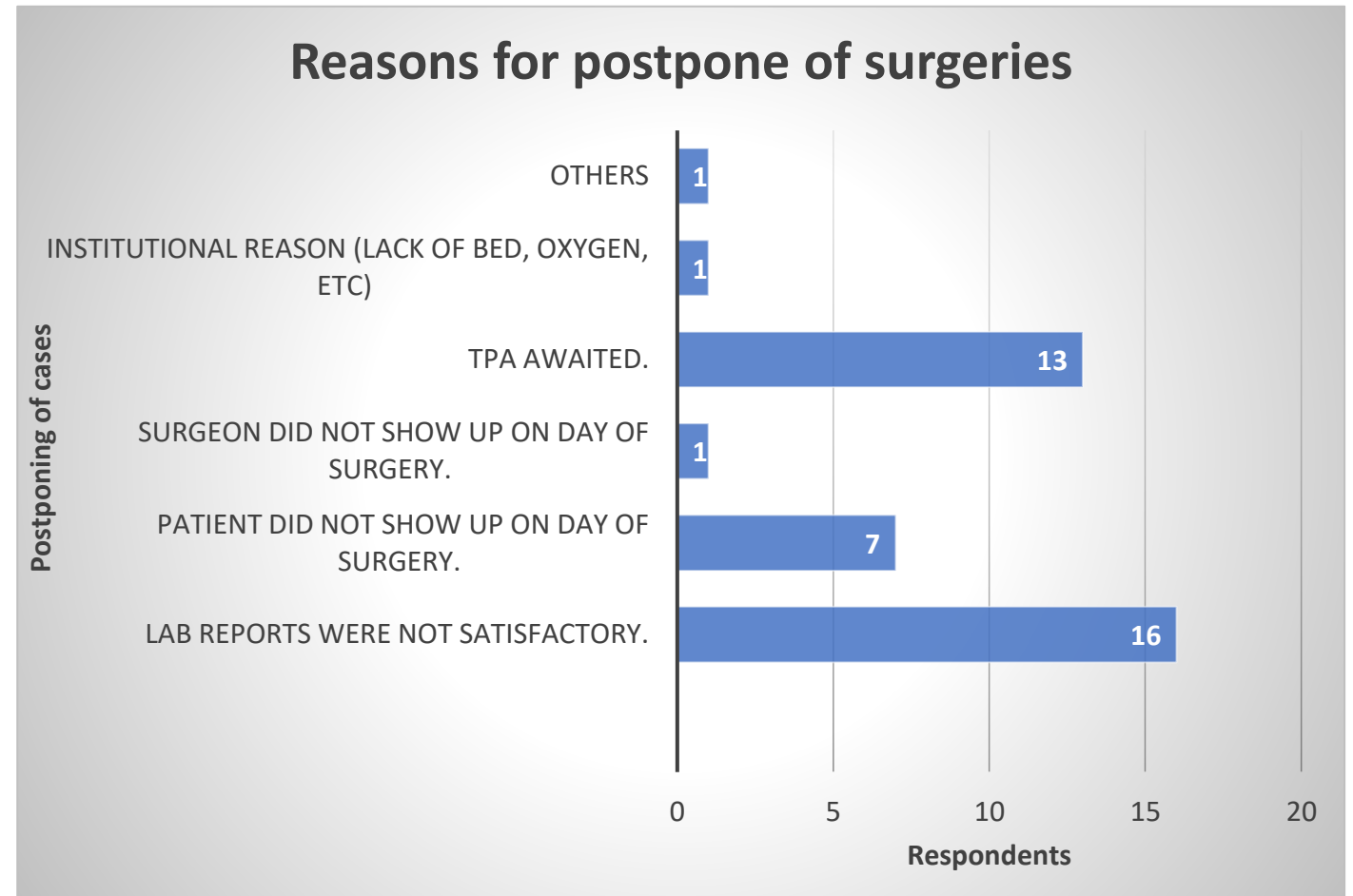


Inter- Deptmental related delay reasons

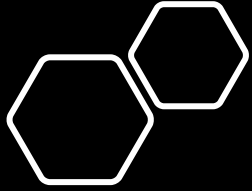




Reasons for postponing of surgeries



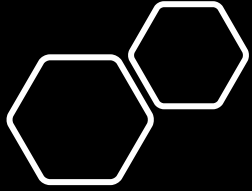
Response of OT staff regarding reasons for postponing of surgery



DISCUSSION

Planned cases and Unplanned cases:

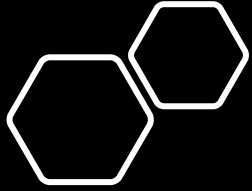
- Planned cases had weightage over add-on cases; denotes that staff usually gets an idea of cases and the requirements needed during surgery a day prior.
- Questionnaire interpreted that unplanned surgeries are majorly the emergency surgeries.
- General Surgery cases which are urgent/emergency usually are cost burdening to the patient and also lopsided the mortality & morbidity [8].
- Multidisciplinary emergency team and effective communication can play an important role in avoiding unwanted situation or life threatening condition.
- Queuing theory model predict the outcome of OR.



DISCUSSION

Early start of surgeries

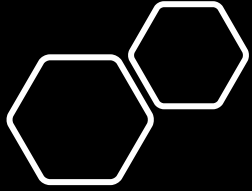
- Very less proportion of cases were done before their planned time
- Orthopaedic the only department where cases are started beforehand the planned list; mostly 1-2 hr before the scheduled time As the orthopaedic patients usually gets admitted a day prior to surgeries and such surgeries are non-emergency thus can wait for a day to be operated.
- Thus, formulating SOPs for other non-emergency surgery to be kept similar to Ortho.



DISCUSSION

Postponing of surgeries/ Cancellations of surgeries

- Orthopedic and General surgery- postponing of surgery
- ENT & General Surgery - maximum cases got cancelled and never happened.
- Non availability of post-operative beds, patient not showing up in hospital on day of surgery, improper patient preparation and unavailability of nurses are some reasons being explained for cancellation [9].
- Cancellation rate was high, thus inefficient use of OR and wastage of resources.
- Cancellation could be surgeon's related that surgeon being busy with another case that less urgent case was postponed/ cancelled [10]. Although on observation and analysis of questionnaire, surgeons not showing up and surgeon cancelling the surgery have never been a reason for cancellation.
- Surgeons underestimate their case duration leading to increased surgeon's fatigue.
- Questionnaire revealed that majority of postponing of surgery are due to awaited lab reports and variation in Patient's vital/ undesired symptoms.

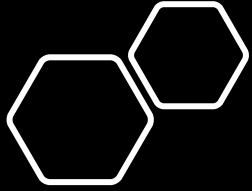


DISCUSSION

Delay of surgeries

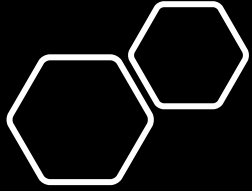


- Gynecology and Ophthalmology with majority of delayed surgeries of approximately 1-2 hour of scheduled time.
- Usually said if first surgery starts late then upcoming surgeries will definitely be late.
- Surgery is said to be delayed if it is late by 10 min of its scheduled time-AAGBI
- Late shifting of patients, Delay in trolley preparedness/OR readiness and clean up procedure are some of the reason for delay [11].
- Inter departmental communication in terms of clearance from their side denoting an action for patient's fitness for the surgery is missing; which is highly observed in the delay of cases.
- Availability of porter or staff for transportation – resulting OTs to be vacant wasting precious time and resources.
- Improper documentation and unsigned consent forms also results in late shifting of patients.



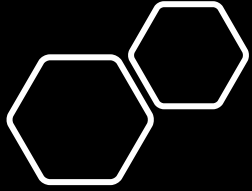
CONCLUSION

- This study highlighted reasons for cancellations, unplanned surgeries-emergency surgeries, delay start of surgery and departments associated with beforementioned.
- Majority of reasons causing delay can easily prevented.
- Several factors resulting in delay are observed especially patient's late hospitalization, lack of clearances from administration, and lack of inter department communication.
- Departments like General Surgery have been identified who have large number of unplanned surgeries. Such departments should segregate the surgeries on the basis of urgency so that planned surgeries are not affected with their addition to list.
- Having a team at every point related to OR process can be useful, which is multi-disciplinary and maintain effective communication among themselves to solve any issue arising at any point of time.



Recommendations:

1. Preparation of OT list after communicating with department coordinator and confirming about the patient to avoid cancellations.
2. Communicate with N. Supervisor and surgeon once OT list is prepared and confirm regarding priority related to case and instruments.
3. Booking, patient's admission, and patient's status to hospital should be intimated to surgeon via smart messaging technique linked with HMIS.
4. Dedicated theatre for add-on surgeries/ emergency cases/ OPD cases.
5. Developing SOPs related to patient preparedness including consent form, documents, lab reports enclosed and to be attached with face sheet.
6. TPA tracking should start at the time of PAC.
7. All the patients should be admitted a day prior to surgery, and this should be checked by department coordinator; so that all the samples are collected on-time and NPO can be maintained.
8. Team leaders should be actively keeping a special check of OT patients.
9. Proper listing of delays and cancellation of surgery to be done for future audits and to check the efficiency and utilization of OT.
10. Availability of GDA and staff for transportation of patient from room to OR and vice-versa.
11. Increasing pre-operative beds



STRENGTHS AND LIMITATIONS

Strengths:

- Result and analysis are the exact replica of what data has shown without any alterations according to convenience.
- Questionnaire findings are the actual representation of OT staff. None of the questionnaire is fake.

Limitations:

- Data for few surgeries are missing as they under documented.
- Booking of cases may not contain the actual data related to patient. So some of the not done cases may be wrong representation.
- Few of the interpretations regarding cancellation can be incorrect because of parallel disaster (COVID) as the data obtained is of Feb and Mar.
- To know the reasons for delay, questionnaire was asked to be filled by staff, which can be near to the real reasons but not exact.
- Questionnaire was filled by only 26 respondents not by 30 staff members, which was expected to be filled.

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THANK YOU!!!

OPEN FOR DISCUSSION...