

Assessing Delays in Operation Theater Activities for Quality Improvement in Wockhardt Hospital, South Mumbai

By

Sonali Singla

*Dissertation submitted in partial fulfillment of the requirements of the degree
MBA Hospital and Health Management*

Academic year, 2017-2019



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TO WHOMSOEVER MAY CONCERN

This is to certify that **Ms. Sonali Singla** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at **Wockhardt Hospital, South Mumbai** from **4th Feb 2019 to 3rd May 2019**.

The Candidate has successfully carried out the study assigned to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all the success in her future endeavors.



Dr. S.D. Gupta

Chairman

The IIHMR University, Jaipur



Col. (Dr.) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur

17 May 19

Date: May 02, 2019

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Sonali Singla** (Student of Indian Institute of Health Management Research University, Jaipur) has completed her 88 days training as a **Management Trainee** from **February 04, 2019** to **May 02, 2019**.

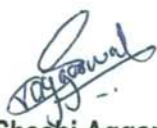
Her dissertation topic is "**A study on optimization and planning of operating theatre activities : defining of pathways and process modelling**".

She has completed training in the following departments at **Wockhardt Hospitals Ltd, Mumbai Central**:

- Medical Administration
- General Administration
- Marketing
- Billing
- Materials & Pharmacy

During her aforesaid tenure, she has been found to be extremely honest, regular and sincere.

For, **Wockhardt Hospitals Ltd,**


Shachi Aggarwal
Manager - Human Resources



THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Assessing delays in Operation Theater activities for quality improvement in Wockhardt Hospital, South Mumbai** and submitted by **Sonali Singla** Enrollment No **IIHMR-U/01/2017-19/0678** under the supervision of **Dr.S.D.Gupta** for award of MBA in Hospital and Health Management in Health and Hospitals of the University carried out during the period from **4th February 2019 to 3rd May 2019** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other institute or other similar institution of higher learning.


Signature

ACKNOWLEDGEMENT

I am very indebted to get a chance to work in an organization which is JCI and NABH accredited, in which I learned a lot and everyone was highly cooperative and provided me necessary information regarding my project as well the functioning of this organization.

I would like to pay my sincere regard and gratitude to **Mr. Amya Sahoo(HR MANAGER)** who gave me the opportunity to do dissertation training in their esteemed organization. He also gave his time and advice very nicely.

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Finally I convey my sincere thanks to **Dr. S.D Gupta (My Guide)** IIHMR university for providing me support, expert guidance ,valuable suggestions and affectionate encouragement .

I solemnly acknowledge my sincere gratitude to all those who have directly or indirectly supported me during this Internship.

Sincerely,

Sonali Singla

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ABRREVIATIONS:

OT: Operation Theater

OR: Operating Room

OPD: Out-patient Department

BMW: Bio medical waste management

TAT: Turn-around time

TOT: Turn over time

PACU: Post Anesthetic care unit

Title: Assessing delays in Operation Theater activities for quality improvement in Wockhardt Hospital, South Mumbai

Introduction :

An operation theatre is a facility within a hospital where surgical operations are carried out in a sterile environment. In other words the operation theatre suit of a hospital is a complex workshop and the most important facility of the surgical department.

Operation theatre represents significant amount of expenditure in the hospital budget. It is imperative that operation theatre is important department which can give most of the revenue generation to the hospital if properly utilized. Considering the magnitude of the cost incurred in the operation theatre, hospital administrator should have more concern about the efficient utilization of the operation theatre. Out of the total surgeries every third case gets delayed in a hospital and the possible causes for the delay might be delayed occur in transferring the patient from admission ward to OT, Equipment failures, delays because of waiting for the radiographer technician or insufficient technician, Lack of surgeon, Anesthetist arrives late for checking the patient and many other, so in order to maximize the utilization of the operation theatre, it is essential to find out how much time is spent on which activity in the operation theatre and identify that which bottlenecks effects the most and prepare a action plan according to the major cause.

Delays within the operating room have an negatively effect on each patients and health care staff though not all delays directly have an effect on patient health, they typically increase anxiety for patients and their families and are a cause of frustration for surgeons and different workers.(1) However, dextral and colleagues¹⁷ argue that saving time within the operating room doesn't essentially increase efficiency of OR because the amount of your time saved by fastening of operating processes isn't enough to permit an additional case to be completed. This is often very true for the neurosurgical surgeries wherever the common operation time is typically longer than normally surgery or medical surgeries in operation rooms. However, though no further cases are accommodated, the time saved continues to be time which will be used for different functions by surgeons and anesthetists, like extra-operative patient care, teaching and analysis. For operating room workers, the extra free time will be helpful in facilitating different aspects of overall hospital room performance. Finally, for patients, performing operations on time can improve satisfaction and can improve their experience at the hospital. (1)

In this study, we tend to target completely on perioperative system delays. These are outlined as delays due to system deficiencies within the operating room, that are classified as error due to failures of method “delay” and instrumentation “equipment failure” and different sorts of errors, like technical or communication errors, may additionally result in delays however these are human factors and social factors instead of on system failures. Perioperative delays occur on the day

of the scheduled operation and which includes delays in patient in time to OR and patient's in time to preoperative area from the time of scheduled surgery and delays throughout the operation.

These delays appeared to be inefficient and undesirable as a result they act as barriers to optimum patient flow and leads to frustrations; however their causes and impact on patient care and resource utilization aren't well outlined. However, solutions for inefficiencies within the OR can't be devised unless the delays that occur on the day of surgery can be observed and analyzed. In this study I have tried to quantify operating room delays, starting from patient in directly to Operating room or to pre-operative area then from pre-operative area to In OR and then surgeon in time, incision time and surgery finish time then admission into the post anesthetic care and ensuing time from turnover between surgeries to observe time taken to clean OR. Improving OT efficiency will leads to many benefits such as reducing overtime pay to staff and more number of cases can be scheduled during the day, revenue will increase and less number of patients will be on the wait list and more number of patients will be satisfied as well as staff.

BACKGROUND:

In the early years like 1970s and 1980s, inpatient stay contributes to most of a hospital's revenue. That time improving efficiency was a little incentive; longer the patient stayed in hospital, larger profits it gave. Previously profits were generated from inpatient diagnostic procedures but now there are diminishing and now scenario has been changed as these procedures or surgeries are now done on an OPD basis with much more costly, sophisticated equipment such as MRIs and CT scanners (Jackson, 2002). Additionally, with up gradation in surgical technology, previously the procedures that would have required a lengthy stay in hospital are now done through invasive techniques that are minimal and that enable faster patient recovery and shorter patients stay in hospital (Jackson, 2002).

OR has been classified as a cost center by General accounting practice, that is responsible for 20-40% of a hospital's costs. On the other hand, it has mistakenly assumed that the OR roughly contributes the same percentage of revenue back to the hospital (Jackson, 2002). (5) Results of a survey of over 200 hospital executives showed that 60% of executives thought that the 20-40% of cost or the profit margin generated by OR was accurate (Jackson, 2002) (5). However, according to the actuarial report of a firm named Towers Perrin which showed 68% of hospital revenues are related to surgery, and this percentage does not include ancillary services provided by hospital such as lab and radiology procedures (Jackson, 2002).(5)

Running the OR is far additional complicated than the total of the individual variable did frame the components .Thus to increase quality care; the goal of any surgical services is to ensure the potential and correct utilization of the ORs. Efficiency of OR can be maximized by reducing the time that an OR is not being employed for revenue-

generation, that means surgical time (Dexter, Macario, 2004). Efficiency can be achieved through managing the many variables e.g. keeping ready instrument sets and reducing operative room turnover times, which will affect the number of surgical cases completed in the allotted time.

Literature review :

Overdyk et al. set a target time of fifteen minutes for anesthesia induction and ten minutes for surgical preparation. Their results Showed roughly 20-25 minutes and twenty five minutes for anesthesia induction and surgical preparation, severally, leading to 45-50 min from patient entrance to incision, on average. (3)

A study conducted by Vinukondaiah et al. had the OT functional for 279 days throughout the year, and 1773 cases were operated (6.3 cases per day). the overall in operational time utilized what ninety one .5%. the main reasons for cancellation of all of 310 cases were lack of operating time (65.2%), emergency surgery Throughout the elective list (13.9%), and preoperative lack of fitness (11.3%). Among all the lists, 43.6% started late and sixty three .6% of lists finished well before the scheduled hour.

Garg et al. conducted a prospective study on the cancellation of cases on the day of surgery. 1590 patients were scheduled for elective surgical procedures in 458 operation rooms. About 30.3% of patients were lost on the day of surgery. Of these, 59.7% were off because of lack of accessibility of theater time, 10.8% were canceled due to medical reasons, and 16.2% failed to happen on the day of surgery. In 5.4% of patients, surgery which canceled by surgeons because of a amendment within the surgical set up, 3.7% were canceled due to administrative reasons, and 4.2% of patients were delayed due to miscellaneous reasons. The authors ended that almost all of the explanations were evitable with previous planning and coordination. (2)

Harders and colleagues found that the second most ordinarily recorded reason for delay within the operating theater, once patient clinical condition, what the provision of instruments. However, the foremost common reason cited by Overdyk and colleagues for perioperative delays was unavailability of the doctor. Variations between authors within the identification of the foremost common causes for delays replicates the variability between patient populations and systems at various hospitals, yet because of the ever-changing causes of perioperative delays over time with the advancement of technology. (6)

A study performed by Gottschalk et al. (2016) focused on the contributing factors that may affect hand surgeon OR TOT. Performed by five attending hand surgeons, a total of 685 hand cases were performed over a 15-month period. The authors theorized that some of the factors that influenced TOT were the following: the surgeon's presence in the room, case type, reducing operating room turnover time's case scheduled time and the patient's American Society of Anesthesiologists (ASA) class. Results indicated that TOT was shorter in cases where the surgeon remained in the OR during turnover (27.5 minutes vs. 30.4 minutes). Patients categorized under ASA Class 1 and Class 2 had significantly shorter TOT by 8.2 minutes and 9.9 minutes respectively than Class 3 patients. The scheduling of cases also had an impact on TOT and it was noted that TOT were longer when it took place between the hours of 12:00 noon and 1:00 pm. Surgical cases were performed in both an ASC and in an orthopedic specialty hospital (OSH) and results indicated that the cases performed in an ASC had shorter TOT (27.9 minutes vs. 36.4 minutes). This study presented different factors that can affect TOT but one limitation that needs to be noted is that the study is limited to orthopedic hand surgery. (6)

Objectives :

- To measure average time of operative procedure starting from Pre-Operative to Post anesthetic care unit in Operation Theater.
- To estimate inter-operative average time in the operation theatre between subsequent operation from patient is wheeled out of operating room to next patient.
- To find reasons for delay in each process and to provide recommendations to improve these processes.

Research question:

Q1: What are the possible reasons/factors for delay's in-between the processes of Operation Theater?

Methodology : Study was conducted in Operating theater of 350 bedded Wockhardt Hospitals Ltd South Mumbai to understand the process in the Operation Theater and operating room, to understand various lacunae in between processes and what possible improvements can be noted down. Study design is descriptive cross sectional and study technique is observational. The OT complex consists of eight major OTs. Study population of this study included selected patients, staffs and doctors in the Operation Theater of Wockhardt Hospital and duration of study is three months from February 2019 to April 2019. 234 samples and 71 samples are selected on the basis of convenient sampling technique.

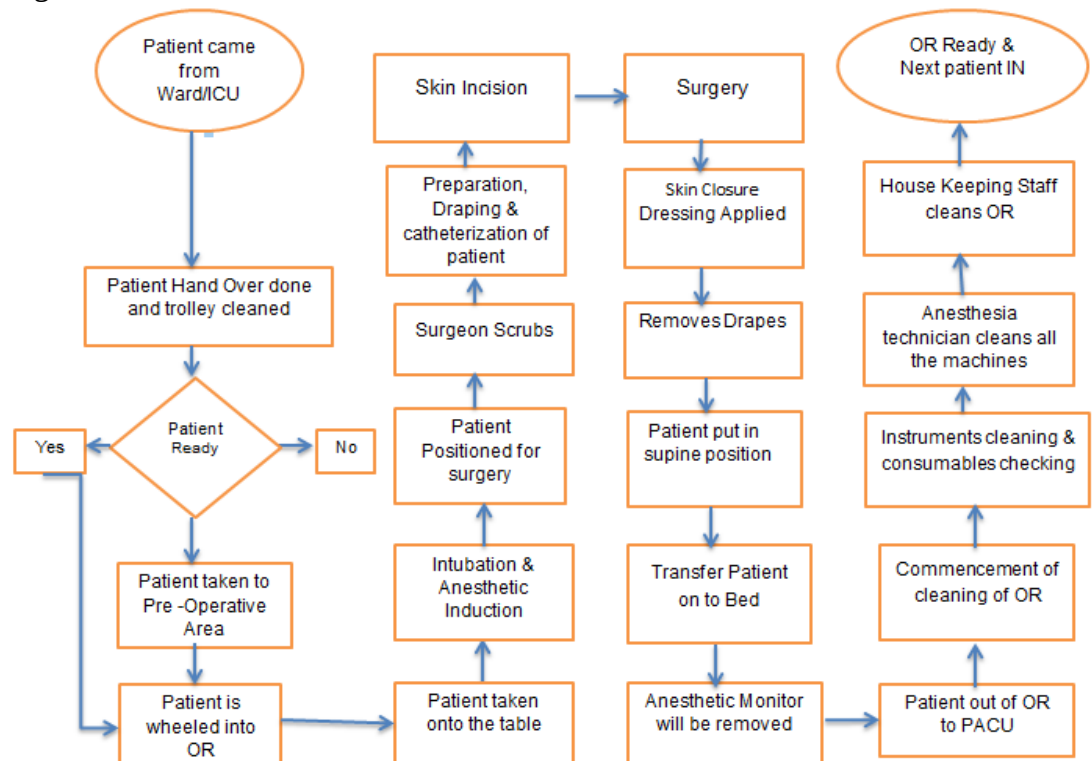
Primary data collection of sample 232 patients is done by direct observation of the time of patient enters pre-operative to PACU and sample 71 (30%) patients being wheeled out of Operating room to operating Room being ready for next scheduled surgery .Secondary data is collected from HIS system of hospital. Normal working hours for routine scheduled

cases are from 8.00 am to 10 pm and night emergencies cases on all working days except Sundays. Inclusion criteria are cases from 8:00 am to 6:30 pm and exclusion criteria is cases at night after 6:30 pm and on Sundays.

Dependent variables of Operation Theater is turn-around time and independent variables are the factors that causes delay in the operating room turnover time such as nursing, anesthesia, surgeon, housekeeping, materials supply, laboratory, patient, x-ray, and other. Process flow chart is formed to illustrate and understand the different activities that make up a process. It will provide a clear picture of what is happening in Operation Theater. It enables to identify problem areas and unnecessary loops of activities by which we can improve any process.

Wockhardt Hospital's SOBO unit have eight operating rooms designed according to the specific surgery .OT 1 for small surgeries, OT 2and 8 for cardiac cases, OT 4 and 3 for transplant, laparoscopy, urology cases, OT5 for neuro cases , OT6 and 7 for orthopedics cases

Figure 1: Process Flow Chart



For operating theater efficiency, start-time delay is a useful indicator. The start time of Operating room cases is defined as 'when the anesthetist starts patient preparation (induction) for surgery and during that time if there is any delay which leads to modification in Operating Theatre List of scheduled cases, it is called Start time delay. Minimal start-time delays will reduce the time patients have to wait and maximize the number of surgery cases achieved per session and which will further reduce cancellations and so waiting lists of cases for the hospital will also be reduced. Many comparative studies stated that at least 75% of patient's surgical procedures should start within or less than 15 minutes of the time scheduled. Therefore cases which are 15 minutes late are classified as a 'delay'. If a case is scheduled to start at 9am but the case started at 9:30am, this leads to a 30 minute start-time delay. From the time a patient enters inside the Operating room anesthesiologists, OR nurses, and surgeons should work together in a well-organized team in order to start surgery promptly and smoothly

Anesthesiologists have major work like intubation and induction that must be done during the time patient enters inside the OR, works such as inserting an IV line and intubation.

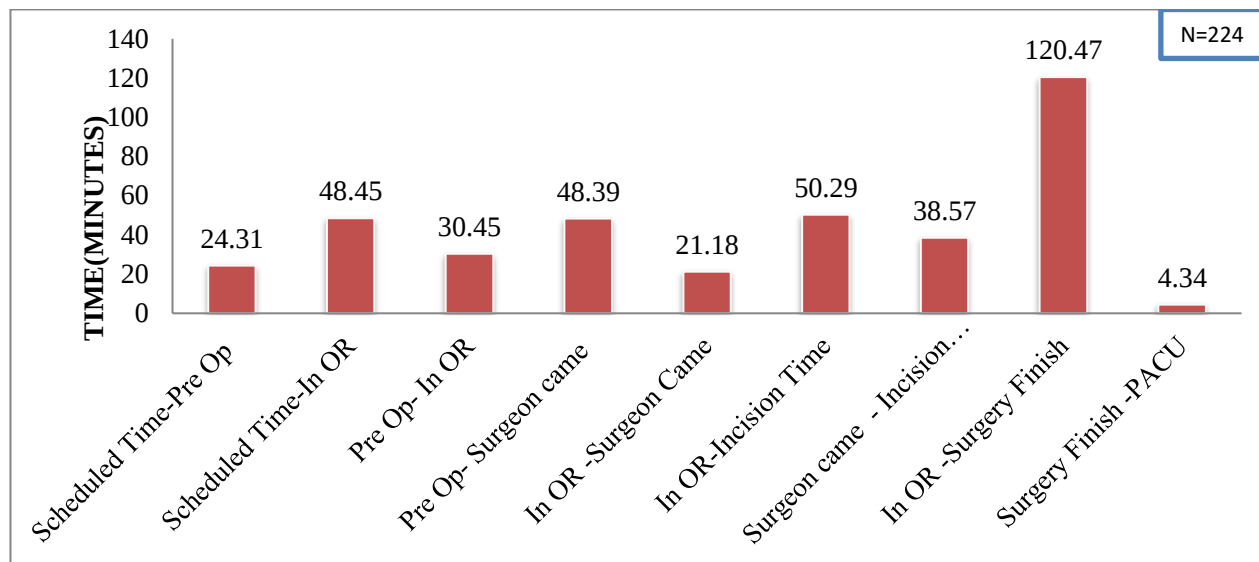
Now a days due to advances in surgical technology i.e. endoscopy; navigation systems and an intraoperative monitoring because of these more time is needed for surgical preparation than required. Sometimes substantial time delays until incision can be caused by equipment malfunction.

The communication gap among all the staff like anesthesiologists, surgeons and nursing staff, lack of their teamwork spirit and limited availability of trained supporting staff can consume a lot of valuable time before a surgery can proceed and during a surgery. For the purpose of this study we have described the main root cause of delays to be either due to theatre practicalities (poor efficiency and management of cases, preoperative areas delays, staff unavailability, operating room not ready, recovery room delay, flow of patients); The supporting housekeeping and nursing staff are usually required for shifting the patients inside and outside the operation theatre, even for positioning of the patient, cleaning of all operating rooms, disinfection of operating rooms and other activities like bringing blood from the bank and bringing consumables from material department which are necessarily required before a surgery can start and during a surgery, hospital-wide factors (ward efficiency, lab report delays, investigation delays, unavailability of staff in departments outside of theatres), or external factors (patient delays, supplies not delivered). The supporting staff is usually untrained and their lack of experience, lack of their interest and accountability contributes maximum to operative delays

According to the data collected, the major areas that contributed to delay in most of the cases were related to either scheduling or patient movement. Since the HIS system only captured clinical data such as OR in time, incision start time and finish time times which helped in comparing data's, all data was taken manually and calculated by capturing the time difference in all the activities in operation theater. Primary data collection is done by firstly direct observation of the time of patient enters pre-operative to PACU.

Findings :

Figure 3.1: AVERAGE TIME TAKEN IN EACH PROCESS



Average time taken in each activity is observed and calculated to find out whether there is any delays in each process or not. Patient is supposed to reach pre-operative area or inside operating room on and before scheduled time. If patient is not coming as per scheduled time then we need to calculate the time in between time scheduled time and the time at which patient reached to pre-operative area. In this study the result between scheduled time to pre-operative is 24.31 minutes, that means patient are getting delayed in reaching pre-operative area by an average of 24.32 minutes and the result between scheduled time and patient In time inside is 48.45minutes , which means patient are reaching inside operating room after a delay of 48.45 minutes. As per hospital SOP patients are supposed to be taken directly inside OR after receiving from ward or ICU. According to their SOP all the investigations, contest forms are to be filled in ward or ICU before bringing patient to OT, they did this so as to reduce the OT TAT and to start the case on scheduled time.

In spite of this policy certain investigations, consent forms and clearance are pending due to which patient shifted first to pre-operative area and then inside OR.As per results in study patient is being shifted from Pre-Operative area to inside OR after an average of 30.45 minutes. As per there SOP Surgeons are supposed to be in OT when patient is taken inside pre-operative area or inside operative room but the results show surgeons are turning up late in OT by an average of 48.39 minutes when the patient is inside pre-operative area. Even when patient is inside operating room then also surgeons are turning up late inside operating room by an average of 21.18 minutes. As per various studies time of activities done from patient enters inside OR to incision time is approximately 20-25 min for anesthesia induction and 25 min for surgical preparation, resulting in 45-50 min from

patient entrance to incision, on average. As per hospital SOP's induction time should be 20 minutes and preparation time should be in between 30-40 minutes depending upon cases as positioning in certain cases takes more time for e.g. in surgeries of shoulder and in TRK surgeries.

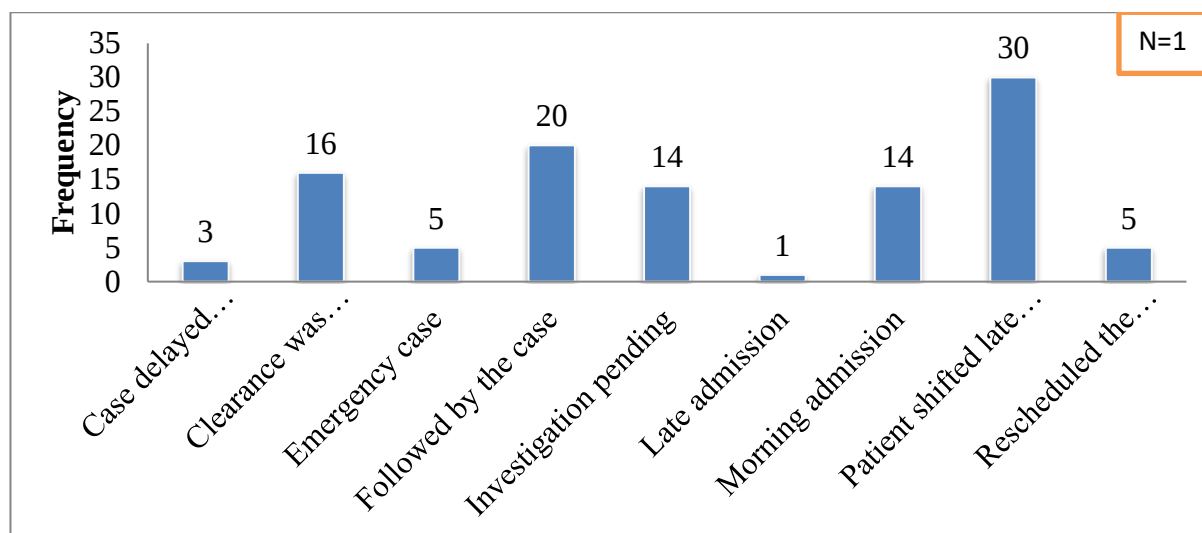
SO as per study results patient in OR time to incision time comes out to be 50.29 minutes which as within the time as per SOP's and studies, so this activity does not contribute to any delay. Results of time surgeon came inside the OR to the incision time is 38.57 minutes also doesn't contribute to any delay. There is as such no standardized time for surgery completion so as per study's result time from incision to surgery finish is 120.47 minutes, which is also not a delay time. After the surgery finishes patient is wheeled out of OR to Post anesthetic care unit(PACU) and ideal time as per SOP's is 5-10 minutes. 10 minutes in case of spinal anesthesia and 5 minutes in case of general anesthesia. SO finding came out to be time from surgery Finish to patient wheeled out to PACU is 4.34 and which is also not a delay.

Table 1 : Gap Analysis

ACTIVITIES	AVG TIME	AS PER HOSPITAL	DELAY	MAXIMUM	MINIMUM	
Scheduled Time-Pre Op	24.31	0	24.31	6 hours	0	Followed by the case
Scheduled Time-In OR	48.45	0	48.45	7 hours 40 min	0	Clearance was pending
Pre Op- In OR	30.45	5 min	25.45	7 hours 15 min	0	Clearance was pending
Pre Op- Surgeon came	48.39	0	48.39	7 hours 15 min	0	Surgeon came late
In OR -Surgeon Came	21.18	0	21.18	4 hours 8 min	0	Surgeon came late
In OR-Incision Time	50.29	20+30=50	0.29	4 hours 3 min	0	Surgeon was busy in some other hospital
Surgeon came - Incision Time	38.57	30-40	-	3 hours 12 min	0	Company instruments was not ready
In OR -Surgery Finish	120.47	Not fixed	-	8 hours 5 min	0.03	
Surgery Finish - PACU	4.34	5	-	30 min	0	

After gap analysis the result came out there are five major activities which contributes to delay in Operation Theater processes. In order to reduce the delays in these activities we need to know there contributing causes or reasons in each activity. Below are the reasons of delay in activities so as to understand which is the main cause which leads to delay in process.

Figure 2.2 : REASONS OF SCHEDULED TIME TO PRE OP AND TO IN OR DELAY REASONS



These are reasons which caused delay in patient wheeled in time to OR and patient wheeled in time to pre-operative area from scheduled time. Main reasons came out to be Clearance pending, investigations pending; morning admission due to which there all pre-operative investigations and consent forms of the patients who admitted in morning got late and due them sometimes rescheduling of planned cases also done. Another major reason is patient came late from wards .It is maximum in number so needs to be further studied so to find out the secondary causes which leads to delay in shifting late from wards.

WARD DELAYS

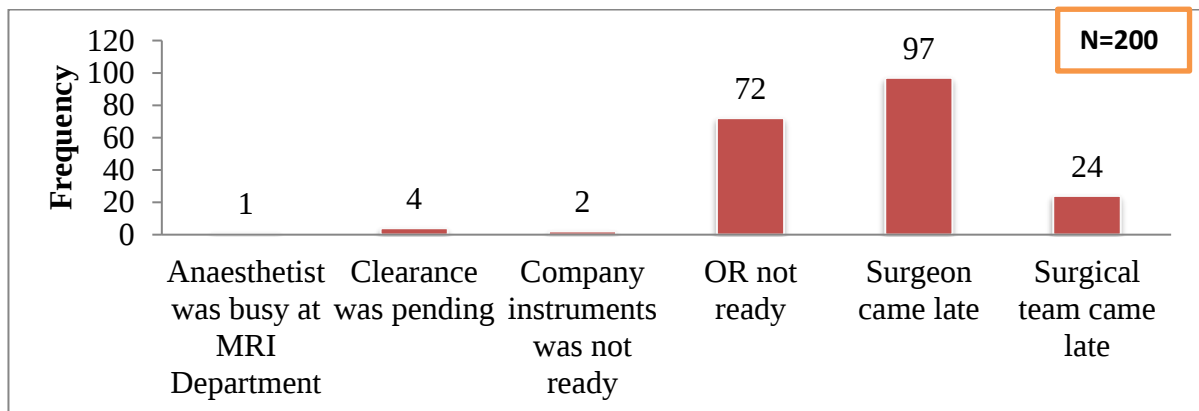
All consent preparation pending, all pre-operative preparations are pending, delay due to unavailability lift, international patient so unavailability of translator for taking consent, patient relatives were not present, patient is not willing to all pre-operative preparations, patient taken as per surgeon's order, patient wanted to go washroom, housekeeping staff was not available to scrub patient, housekeeping was not available to transfer patient, clearance pending etc.

INVESTIGATIONS PENDING

Physician fitness pending, pulmonary fitness pending, patient was waiting for Cardiac fitness, patient went for 2D ECHO@10:05AM, PAC Pending, neuro consultation pending, patient went to MRI Department, nephrology consultation was pending, cardiac fitness pending.

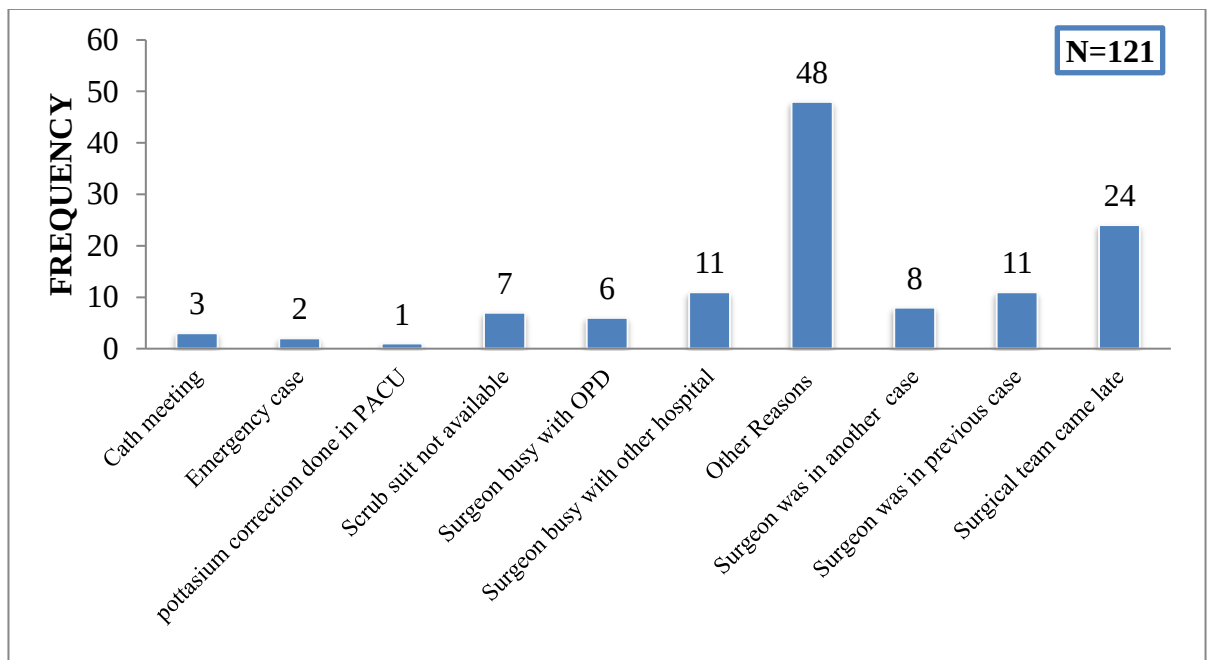
Similarly found out reasons of delay from patient in pre-operative area to the time patient wheeled inside operative room.

Figure 2.3: REASONS OF PRE OPERATIVE TO IN OR DELAY



Major reason came out to be surgeon coming late ,surgical team coming late and operating room not ready due to which patient is shifted late inside the OR . As per the findings of study surgeon came late to OR even when the patient is in pre-operative area or when patient is inside OR by 48.39 minutes and 21.18 minutes respectively, so in depth study required to know why surgeons are coming late.

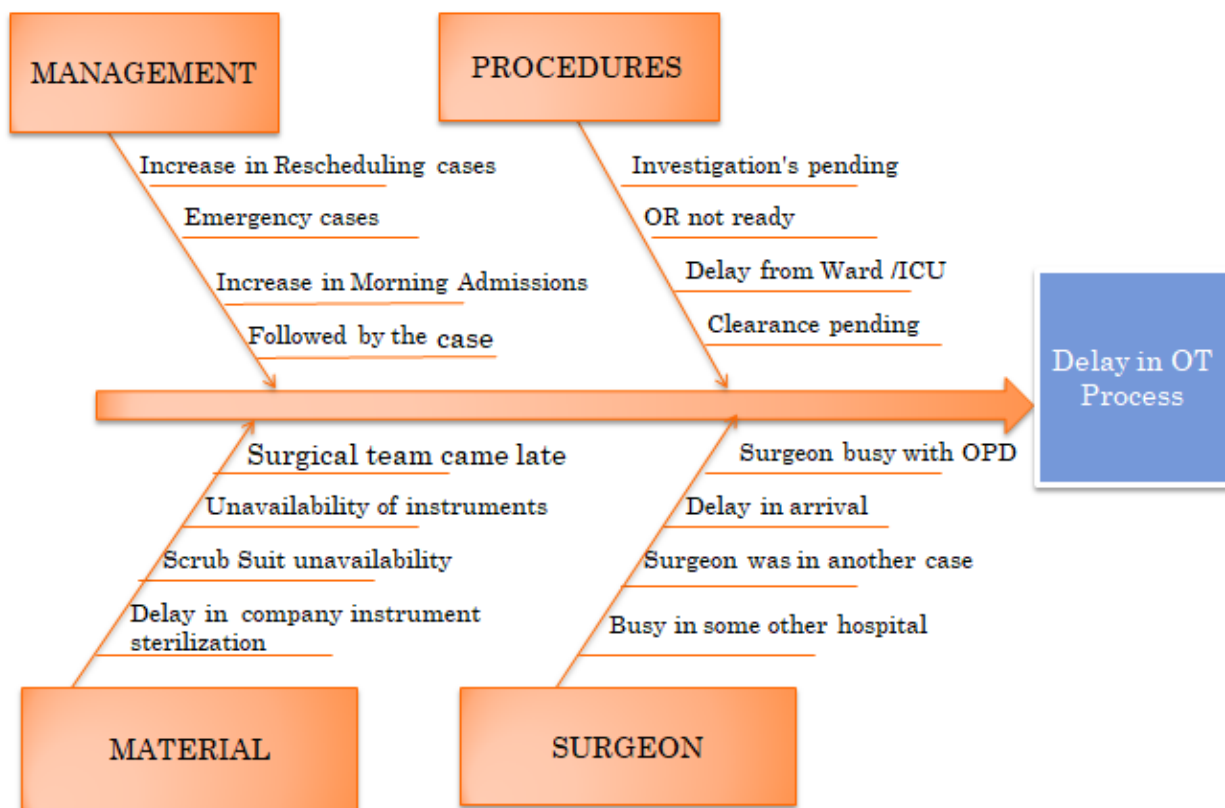
Figure 2.4: REASONS OF SURGEON TO IN OR AND SURGEON TO PRE OP DELAY



The results showed the main reasons of surgeon's delay are sometimes they are busy inside another case, busy in OPD, busy with other hospital, busy in previous case, all these does not account for surgeons delay as he is performing his duties .These can be avoided by proper rescheduling and time management. Along with this 48 times they came late and reason for which is unknown and it definitely accounts for delays due to surgeons

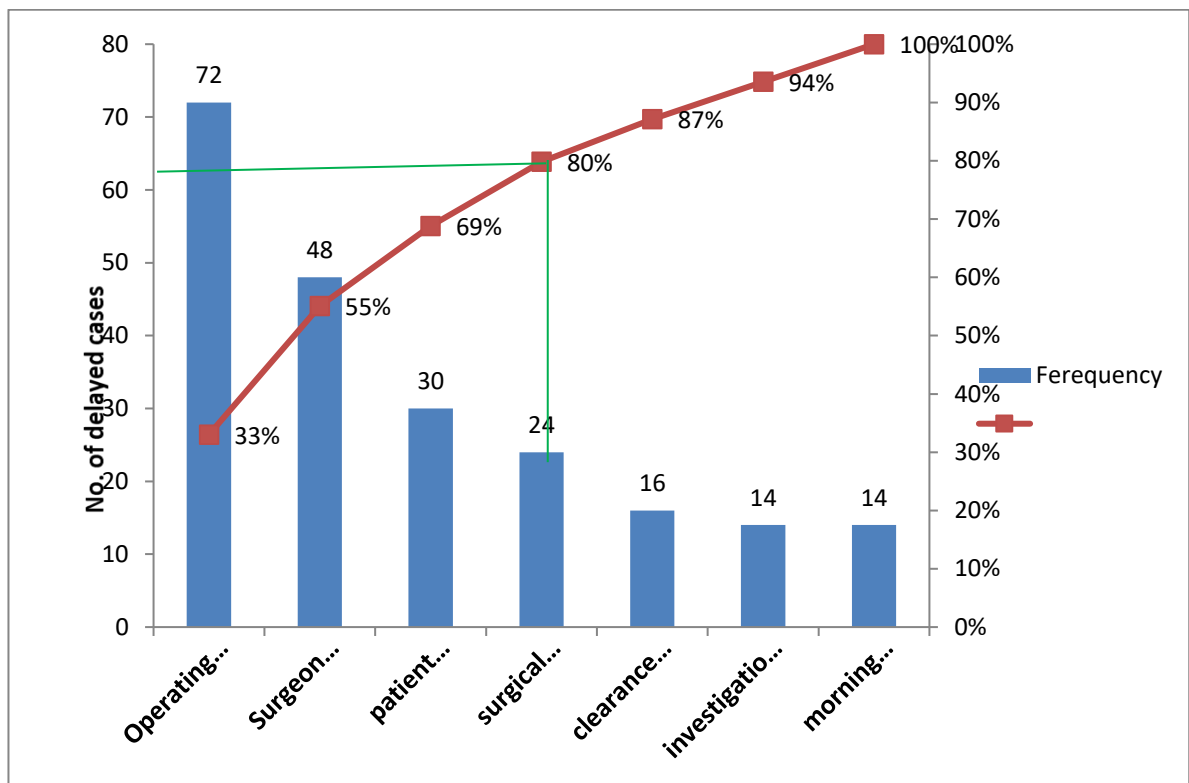
Results:

Figure:3.1 Fish Bone Analysis



Conducted a brainstorming sessions to identify the possible causes of delay in OR activities and building on ideas to identify and explore all the possible causes behind the outcomes. All possible causes were classified into four broad categories: Management, Process, Material and Surgeon. These categories are based on the quality improvement tool for all process. A cause and effect diagram was made to elaborate outcomes. Once the causes were jotted down, Pareto rule was applied to identify the "vital few" reasons for delay. The Pareto principle, also known as the 80/20 rule, is a theory maintaining that 80 percent of the output from a given situation or system is determined by 20 percent of the input.

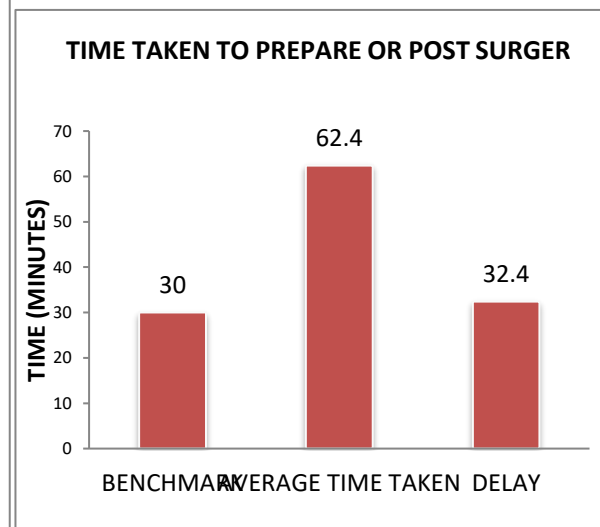
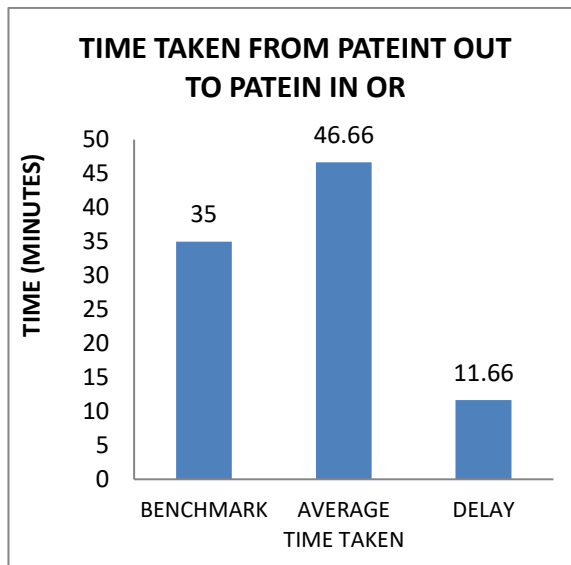
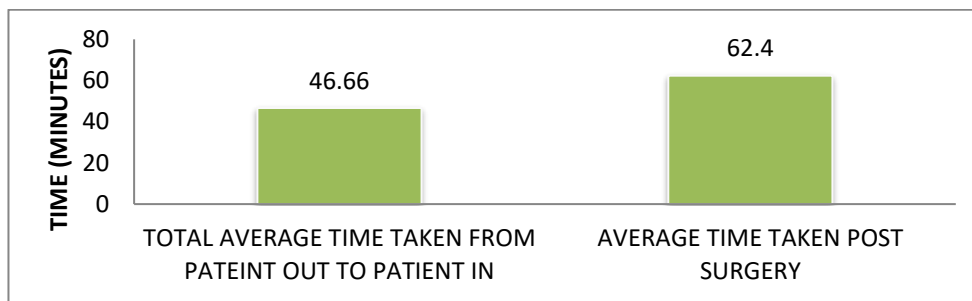
Figure:3.2 Pareto Analysis



As per the results 72 cases out of 232 delay was due to Operating Room was not ready that is very significant in number so in order to rule out root cause, need to conduct a further study to understand what are the causes behind this delay so aim of this further study is to calculate average time taken when patient is wheeled out of operating room to the same operating room being ready for next scheduled surgery.

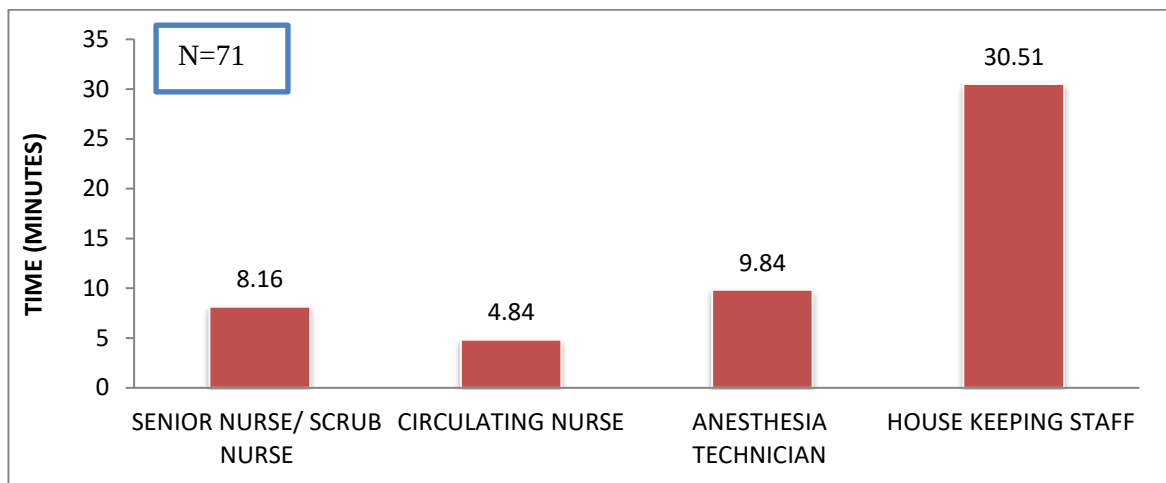
The first objective of trying to improve OR efficiency is through decreasing turnaround time. As per Surgeons expectations and as per Hospital's management the minimum time taken from patient-out to patient-in should be 30 minutes or less. There are many cost benefits of decreasing the turnaround time of OR such as overtime pay to staff can be reduced and more number of cases can be scheduled during the day. Due to more number of cases per day revenue will increase and less number of patients will be on the wait list. Decreasing turnaround time i.e. Patient in to patient out time is vital to maintaining the hospital's margin this will make the hospital more efficient.

Figure 4.1: Average times



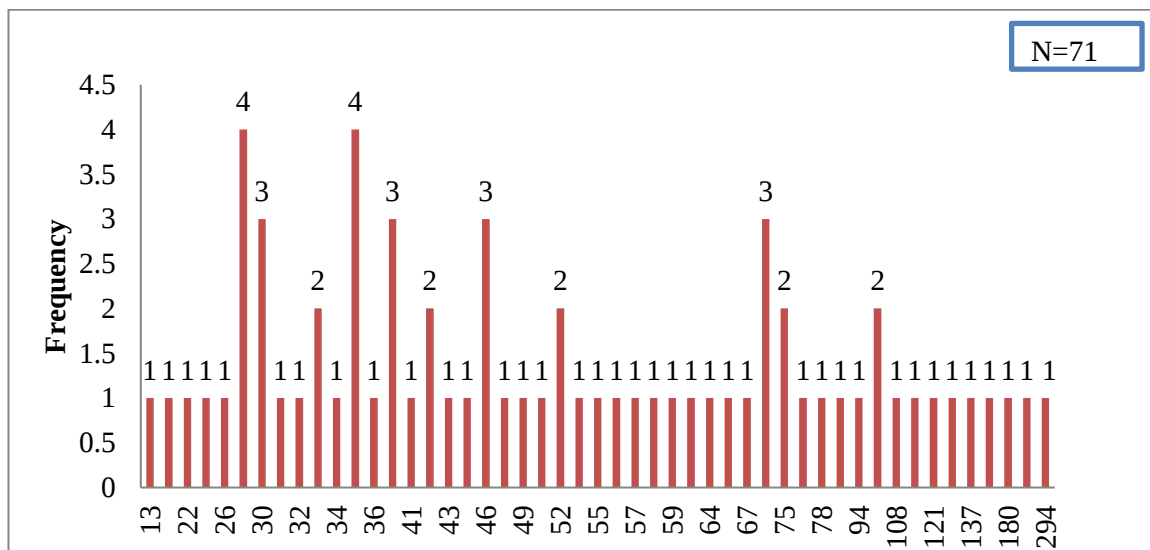
As per Hospital's management the minimum time taken from patient-out to patient-in should be 30 minutes or less or the OR should be ready within 30 minutes from the time patient is wheeled out of the OR but result shows staff is taking 46.66 minutes to ready the OR in case of consecutive surgery and if there is no planned consecutive surgery in same OR then they take 62.4 minutes to clean and ready the OR, which is significantly more than then standardized time set by Hospital management. In order to reduce this time appropriate causes needs to be known. To find out the causes behind these delays, timings of each activities are noted which are done inside the OR after patient is wheeled out of OR. There are total four activities which took place after patient wheeled out of OR i.e. counting and cleaning of instruments done by senior/ scrub nurse, counting and return of un- used consumable items to store done by circulating nurse, cleaning and checking of machines done by anesthesia technician, changing of BMW disposal bags and cleaning of OR by housekeeping staff.

Figure 4.2 : AVERAGE TIME TAKEN IN EACH ACTIVITY POST SURGERY FOR PREPRATION OF OPERATING ROOM



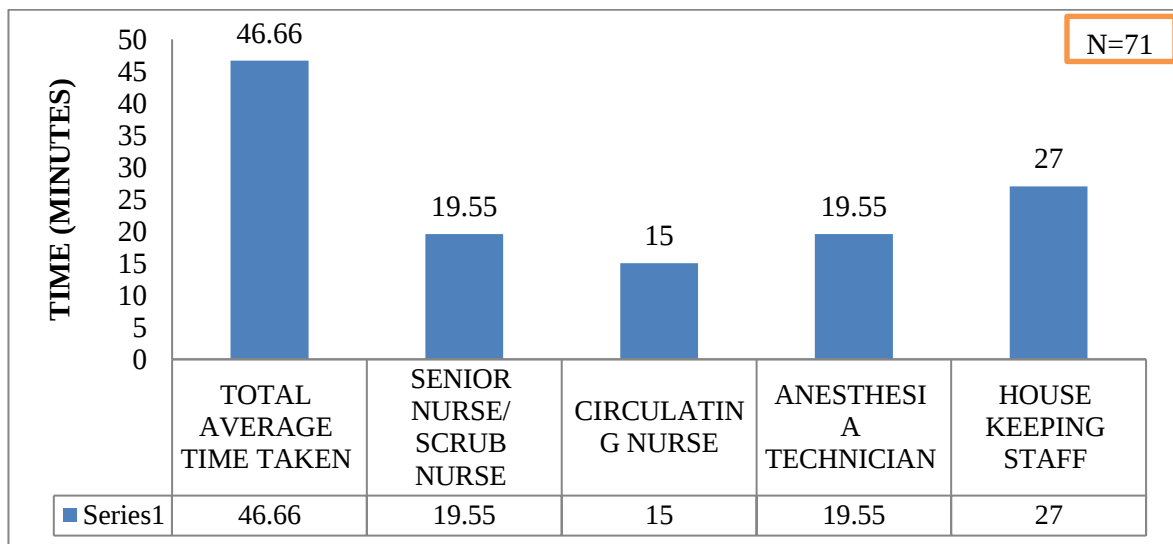
Results show average time taken to ready OR after patient is wheeled out of OR to PACU is 62.4 minutes. But if we see individually activities then senior nurse or scrub nurse took an average of 8.16 minutes to count and clean instruments, Circulating nurse took 4.84 minutes to count and return un- used consumable items to store, anesthesia technician took 9.84 minutes to clean and check of machine and housekeeping staff took an average of 30.41 minutes to clean OR .These activities are not done one after another but these activities performed with each other or side by side. If seen individually then all these activities can be done under or in 30 minutes but still this is not happening as the average time taken to ready OR after patient is wheeled out of OR to PACU came out be 62.4 minutes. That means there are certain reasons behind this delay which needs to be rule out.

Figure 4.3: TIME TAKEN TO PREPARE OR (POST SURGERY)



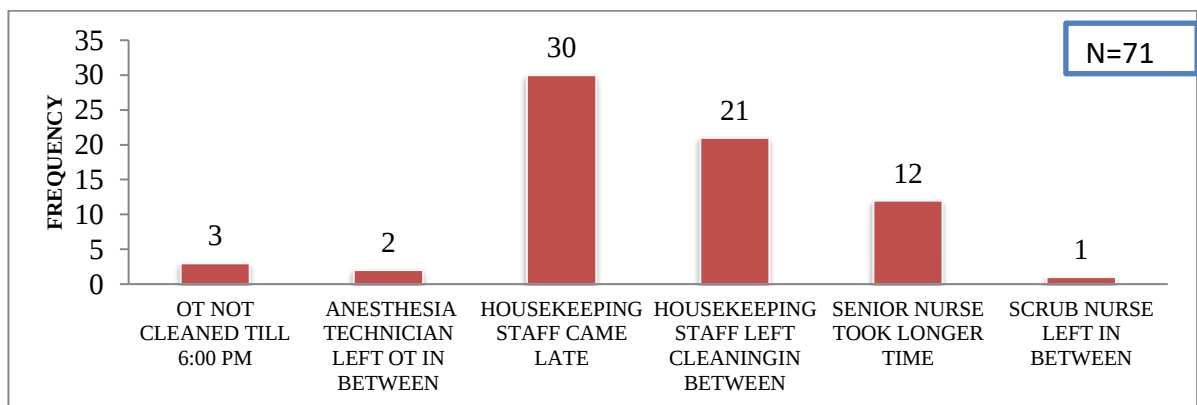
Only 12 cases are under 30 minutes out of 71 cases and rest are above 30 minutes

Figure 4.4: PATIENT OUT TO PATIENT IN (TWO CONSECUTIVE SURGERIES) IN MINUTES



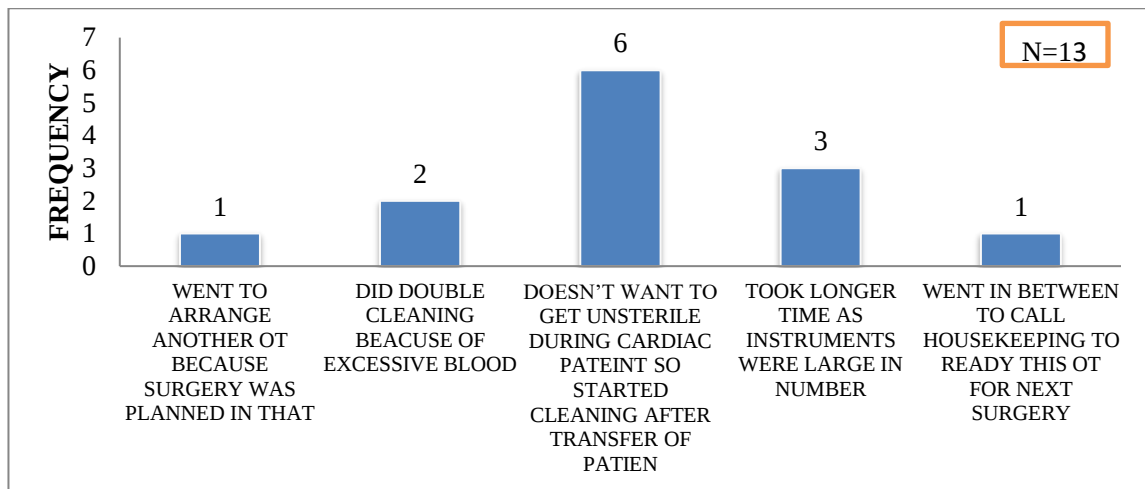
Results show average time taken to ready OR after patient is wheeled out of OR to next patient wheeled inside same OR is 46.44 minutes. But if we see individually activities then senior nurse or scrub nurse took an average of 19.55 minutes to count and clean instruments post-surgery and then after OR is cleaned arrangement of instruments as per the next consecutive case, Circulating nurse took 15 minutes to count and return unused consumable items to store post-surgery and then arranging consumables on racks and doing tagging as per new consecutive case in that OR, anesthesia technician took 19.55 minutes to clean and check of machine after surgery and keep injections and machines and OR table positioning ready for next surgery, housekeeping staff took an average of 27 minutes to clean OR post-surgery to make it ready for next consecutive surgery. Individually these activities also showed all these activities can be done under or in 30 minutes but in case of consecutive surgeries also it is not happening. Now the reasons behind these delays need to be ruled out.

Figure 4.5: OPERATING ROOM PREPARATION DELAYS



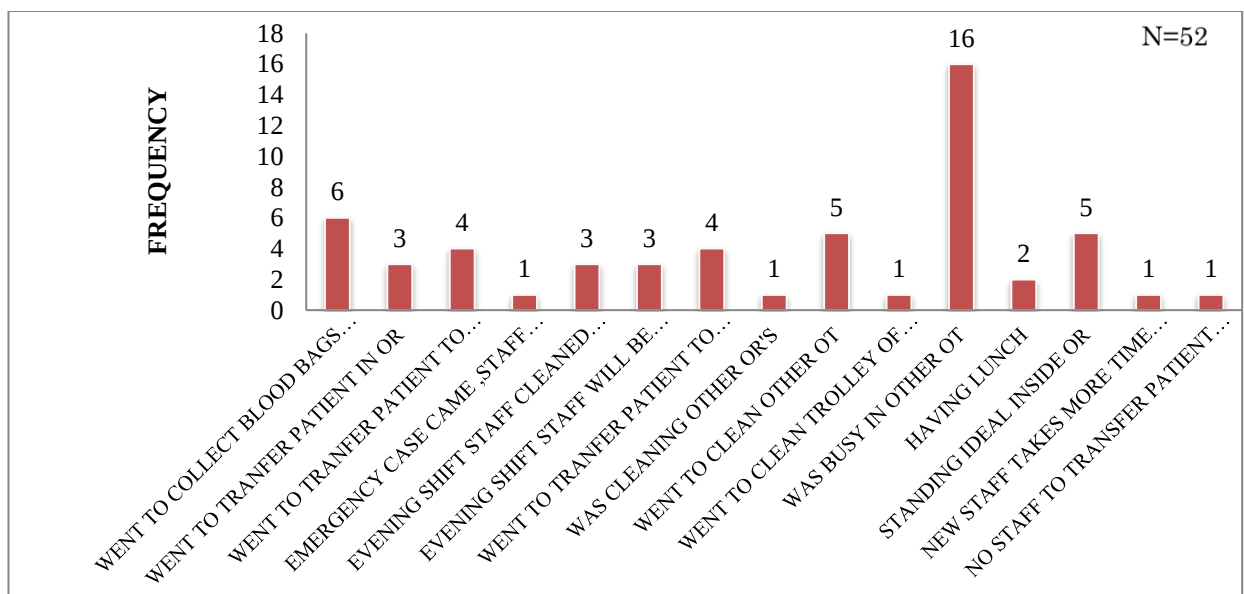
Reasons behind the delays came out to be three times OR was not cleaned till 6:00 pm ,two times anesthesia technician left OR in between, thirty times housekeeping staff came late and twenty one times housekeeping staff left cleaning in between, twelve times scrub nurse took longer time and one time scrub nurse left in between. Majorly housekeeping staff and scrub nurse delays are there. Further, the possible reasons behind these two delays are found out.

Figure 4.6: SCRUB NURSE REASONS



Senior nurse delay reasons are not that significant as these cannot be considered as delays rather considered as time consuming in performing or following standard operating procedures.

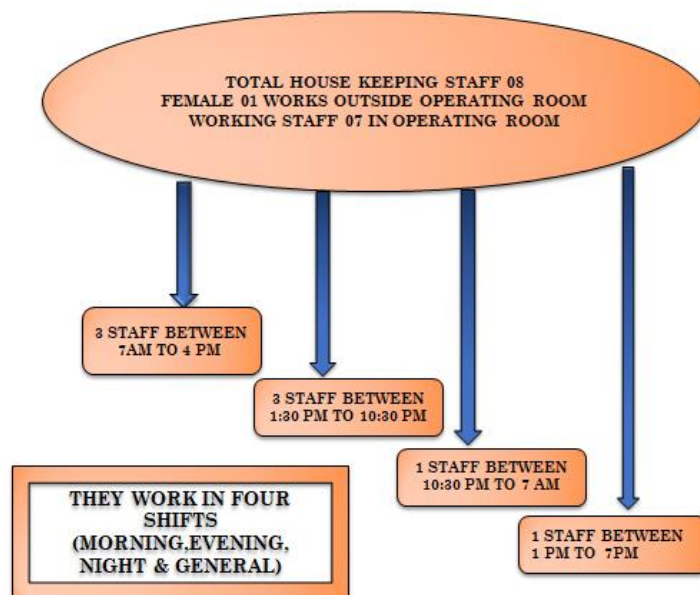
Figure 4.7: HOUSE KEEPING DELAY REASONS



Housekeeping staff are involved in many other activities except for cleaning of OR which leads to delay in OR cleaning time. They have to perform these activities within that time like collecting blood bags for patient, transferring patient in OR, transferring patient to PACU, Cleaning OR in which emergency case came, transferring patient to ICU, cleaning OR's, positioning of patient, transferring of patient to OR operating table, Cleaning trolleys etc. Due to these reasons half of time delay occurs but these are important and non-deductible things. Delays which can be deductible are standing ideal inside OR, giving excuses that evening shift staff will clean the OR, spending more time in having lunch, proper training to new staff as new staff takes more time to understand. As non-deductible activities are more so we need to find out the other alternative to reduce delay.

Other alternative can be increasing housekeeping staff. In order to increase house-keeping staff first need to understand the available staff and amount of time taken by staff in cleaning OR. Staffing is also a major factor that affects the efficiency of the OR that should be considered to improve the process. The second largest OR expense is usually staffing after supplies is often linked to number of cases per day. Experienced OR nurses, anesthetic technicians, housekeeping staff are expensive and they all are important parts of the flow in the OR. Unnecessary overtime of staff can be a result of an unpredictable OR schedule. So it is must to know how much staff is available and how much it costs.

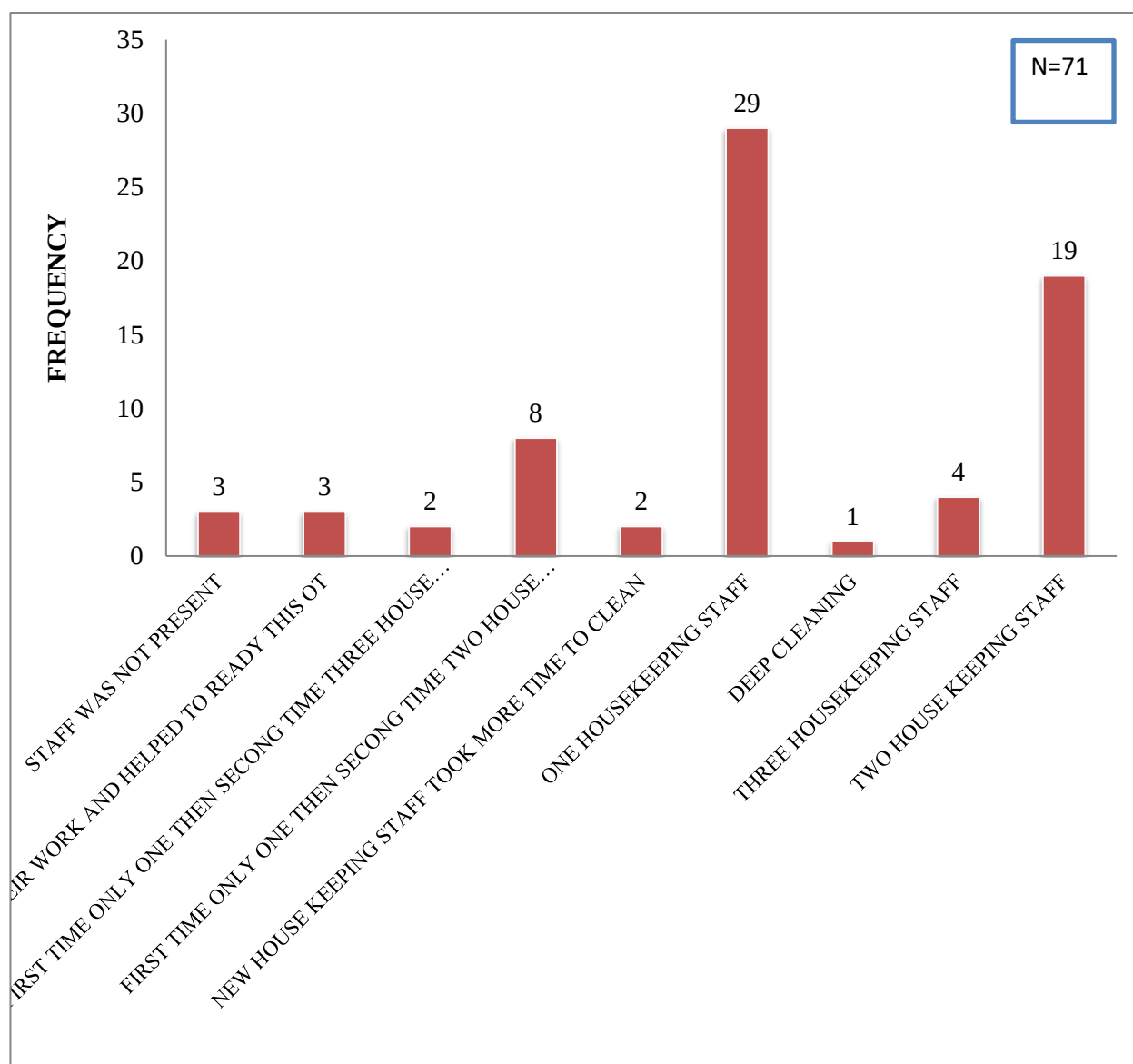
Figure 4.8: HOUSE KEEPING STAFFING



Total 8 housekeeping staffs are employed for operation theater. One female works outside operating room and other seven they work inside operating room. Number of staff is known

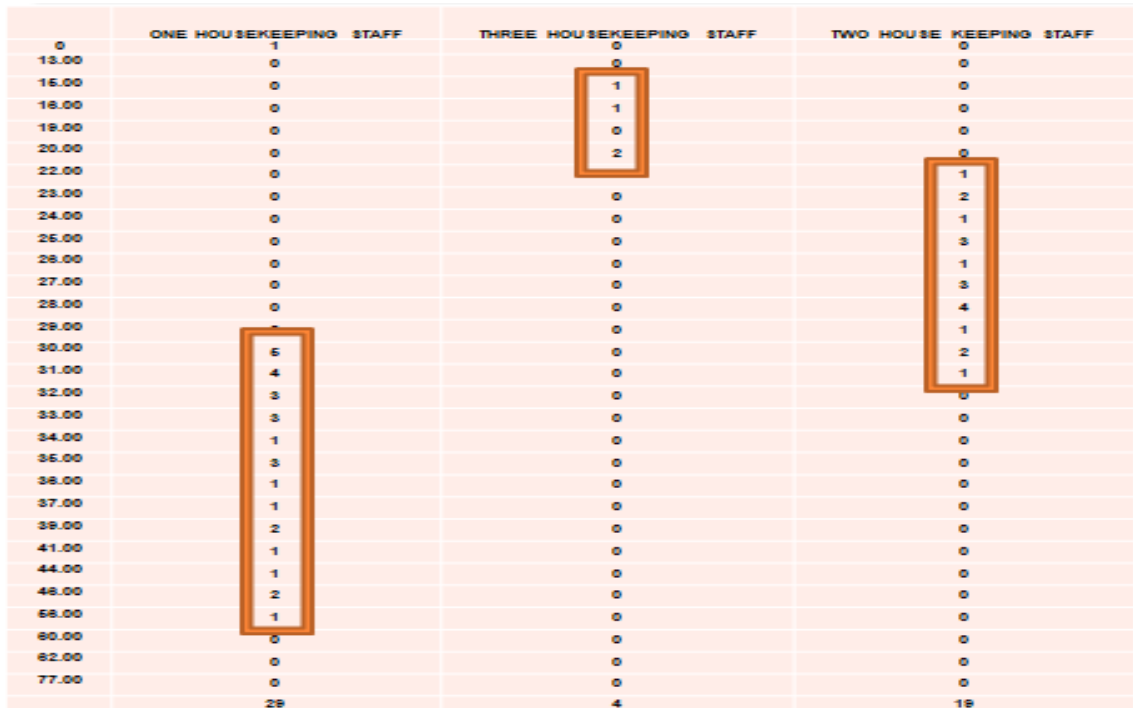
but how much a staff takes to clean will help in finding the need of increase in housekeeping staff in OR.

Figure 4.9 :.NUMBER OF HOUSE KEEPING STAFF CLEANING



This chart represents maximum time a single staff cleans the OR i.e in 29 cases out of 71 cases and in 19 cases there were two housekeeping staff cleaning the OR.

Figure 5.1 : TIME DISTRIBUTION OF HOUSE KEEPING STAFF



This shows three Housekeeping staff cleans OR within 20 minutes, two staff cleans within 22 to 30 minutes and one staff takes more than 30 minutes to clean. If we need to bring down average time of OR preparation post-surgery to 30 minutes then we can employee two housekeeping staff for cleaning one OR this will reduce time taken in cleaning.

COUNT	VAR00009							
VAR00010 * VAR00009 CROSTABULATION	HOUSE KEEPING STAFF LEFT CLEANING IN BETWEEN TWICE	HOUSEKEEPING STAFF AND ANESTHESIA TECHNICIAN LEFT OT IN BETWEEN	HOUSEKEEP ING STAFF CAME LATE	HOUSEKEEPING STAFF CAME ON TIME	HOUSEKEEPIN G STAFF LEFT CLEANING IN BETWEEN	OT NOT CLEANED TILL 6:00 PM	SCRUB NURSE LEFT IN BETWEEN	TOTAL
VAR00010	0	0	0	0	0	0	1	1
HOUSE KEEPING STAFF WENT TO COLLECT BLOOD BAGS FOR PATEINT	0	2	0	0	3	0	0	5
HOUSE KEEPING STAFF WENT TO TRANFER PATIENT IN OR	0	0	0	0	3	0	0	3
HOUSE KEEPING STAFF WENT TO TRANFER PATIENT TO PACU	2	0	0	0	2	0	0	4
EMERGENCY CASE CAME HOUSE KEEPING STAFF WAS BUSY IN PREPARING OTHER OT	0	0	1	0	0	0	0	1
EVENING SHIFT HOUSEKEEPING STAFF CLEANED THE OT	0	0	3	0	0	0	0	3
EVENING SHIFT HOUSEKEEPING STAFF WILL CLEAN THE OT	0	0	0	0	0	3	0	3

HOUSE KEEPING STAFF WENT TO TRANSFER PATIENT TO ICU	0	0	0	0	4	0	0	4
HOUSE KEEPING STAFF WAS CLEANING OTHER OR'S	0	0	1	0	0	0	0	1
HOUSE KEEPING STAFF WENT TO CLEAN OTHER OT	0	0	0	0	5	0	0	5
HOUSE KEEPING STAFF WENT TO CLEAN TROLLEY OF PATIENT	0	0	0	0	1	0	0	1
HOUSEKEEPING STAFF WAS BUSY IN OTHER OT	0	0	16	0	0	0	0	16
HOUSEKEEPING STAFF WAS HAVING LUNCH	0	0	2	0	0	0	0	2
HOUSEKEEPING STAFF WAS STANDING IDEAL INSIDE OR	0	0	5	0	0	0	0	5
NEW HOUSE KEEPING STAFF TAKES MORE TIME TO UNDERSTAND	0	0	1	0	0	0	0	1
NO HOUSE KEEPING STAFF TO TRANSFER PATIENT TO PACU , PATIENT WAITED FOR 7 MINUTES IN OT THEN NURSES AND TECHNICIAN BRING TROLLEY	0	0	1	0	0	0	0	1
ON TIME	0	0	0	15	0	0	0	15
TOTAL	2	2	30	15	18	3	1	71

Figure 5.2 : NURSES STAFFING

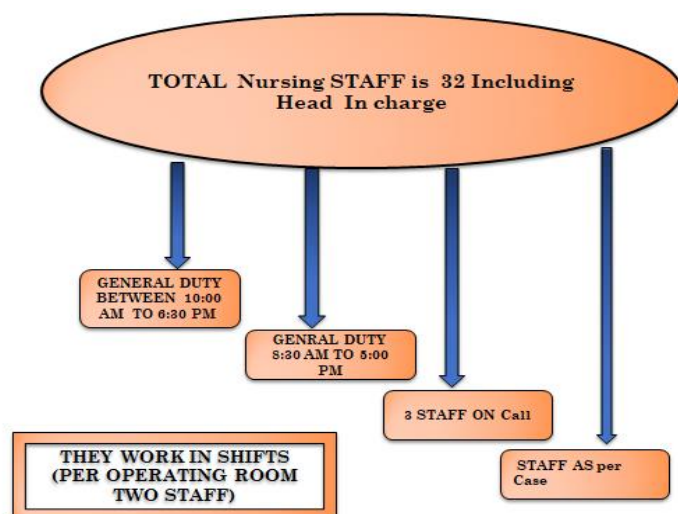
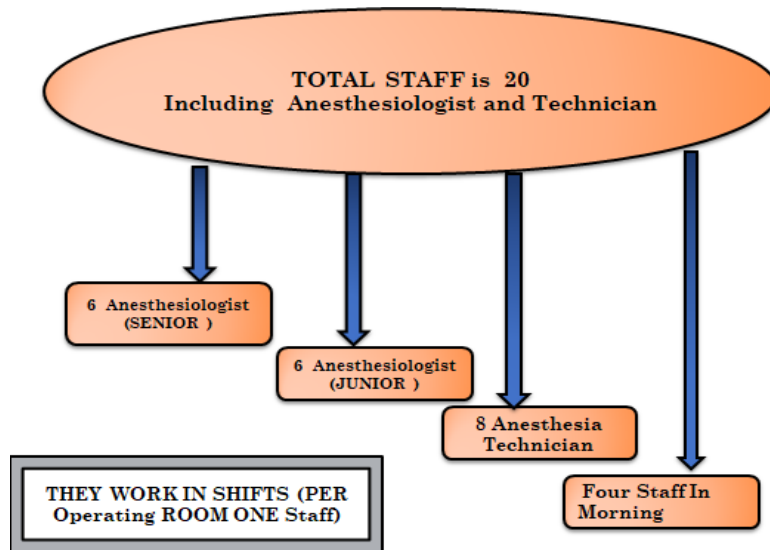


Figure 5.3 :ANESTHESIOLOGIST AND TECHNICIAN STAFFING



In case of nursing and anesthetic technician staff there is no need to increase the staff as the delays caused by them are few. Requirement of staff per case, one senior nurse, one circulating nurse, one senior anesthesiologist, one junior anesthesiologist, one anesthesia technician, one surgical representative, one housekeeping staff.

SUGGESTIONS:

- Proper communication among surgeons, anesthesiologist, nurses and ward RMO's at night before the surgery is planned regarding consents and clearances, this will help in reducing morning delays
- Keeping a dedicated Theater for emergency cases this can avoid rescheduling of cases due to the last moment entry of emergency cases.
- Scheduling of OT cases in morning can be late by an hour as in the morning surgeons have to visit in wards to see their operated patients. So it will decrease the number of surgeon related delays and patients on both sides will not suffer.
- Displaying Dash Boards: Early communication to the OT Staff when any surgery is about to be finish, so that all involved staff are ready to do their part
- House-keeping Staff can keep new color coded BMW bags outside the Operating rooms early then bringing them after patient is wheeled out of OR, this will save their time.
- Using a More Efficient Cleaning Agent that has a faster dry time and is more effective.

- Increase in the housekeeping staff as the result shows one house keeping staff takes more than 30 minutes to clean one operating room and moreover they are involved in other necessary activities too except for cleaning the OR.
- Surgeons, Anesthetist, OR staff and hospital administration should form a team and clearly identify roles which will determine which activities may be safely carried out simultaneously without compromising the safety of both patients and staff . (7)

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APPENDIX:

The time of patient enters pre-operative to PACU

Sr.No	Date	Scheduled Time	OT	Patient Name	Surgery	Specialities	pre op	In ot
consultant came at	Incision Time	OUT TIME	Received Post-Op Patient In PACU	OUT TIME	Reason for delay	Remarks		

- For time calculation of patient being wheeled out of Operating room to operating Room being ready for next scheduled surgery

SNO.	DATE	UHID NO.	PATIENT NAME	SURGERY	SPECIALITIES	OT NO.	PT IN OT	PT OUT OF OT
COUNTING AND CLEANING OF INSTRUMENTS DONE BY SENIOR/ SCRUB NURSE	COUNTING AND RETURN OF UNUSED ITEMS TO STORE DONE BY CIRCULATING NURSE	CLEANING AND CHECKING DONE BY ANESTHESIA TECHNICIAN DONE	HOUSE KEEPING IN OT	HOUSEKEEPING LEFT IN BETWEEN	HOUSE KEEPING CAME BACK AT	CLEANING DONE BY HOUSE KEEPING	TOTAL TIME TAKEN	REMARKS

- For consecutive surgeries / to calculate Patient out time to patient in time :

SNO.	DATE	UHID NO.	PATIENT NAME	SURGERY	SPECIALITIES	OT NO.	Pt in OT	Pt out of OT
COUNTING AND CLEANING OF INSTRUMENTS DONE BY SENIOR/ SCRUB NURSE	COUNTING AND RETURN OF UNUSED ITEMS TO STORE DONE BY CIRCULATING NURSE	CLEANING AND CHECKING DONE BY ANESTHESIA TECHNICIAN DONE	HOUSE KEEPING IN OT	HOUSEKEEPING LEFT IN BETWEEN	HOUSE KEEPING CAME BACK AT	CLEANING DONE BY HOUSE KEEPING	TOTAL TIME TAKEN	REMARKS

NUMBE R OF HOUSE KEEPIN G STAFF	SENIOR/SCRU B BRINGS AND SETS INSTRUMENT TROLLIES IN OPERATION ROOM	CIRCULATI NG NURSE ARRANGES ALL CONSUMBL ES WITH LABELLING ON SLABS	ANESTHE SIA TECHNICI AN PREPARES AND CHECKS ALL MACHINE S	HOUSEKKEPIN G ARRANGES BED POSITION AND SETS WARMER	REASONS
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