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UTILIZATION RATE OF OPERATION THEATRES –ITS EVALUATION AND IMPORTANCE

Management

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ABSTRACT

Utilization analysis is an important part of hospital operations which has been a priority area for hospital administrators. It is essential to improve the efficiency of operation theatres and to decide about augmentation or downsizing of the theatre facility. This study aims at measurement of utilization of Operation rooms. The study covered 5 major departments Urosurgery, General surgery, Gastro-intestinal surgery, ENT and Pediatrics. Average utilization of Gastrointestinal OT, General Surgery OT, Urology OT, Pediatrics OT and ENT OT was calculated to be 98%, 77%, 91.5%, 102% and 85.4% respectively while average turnaround time was found to be 26 minute, 35 minutes, 29 minutes, 33 minutes and 27 minutes respectively. Optimum utilization can be achieved by good interaction between OT and hospital staff, and benchmarking of procedure timing to make effective scheduling of OT.

KEYWORDS

Operation theatres, Utilization, Turnaround time,

INTRODUCTION

Healthcare institutions are more focused in providing good quality healthcare services at an affordable price. Procedural or surgical interventions form one of the most important reasons for hospital admission in today's time. [1] Within the hospital, Operating theatres are considered to be the most expensive facility. They are believed to consume a large part (>40 %) of the hospital's annual budget. [2] The hospital management always is in search of tools for optimizing patient flow, studying the various processes in the operation area, and the utilization rate of the OT at the minimum cost possible. This can be achieved by increasing efficiency along with proper utilization of resources in OT. It is the goal of optimization that drives modern hospital management in managing services today. [3,4]

Operation theatres are capital intensive part of hospitals. Heavy fixed and variable costs are incurred to run this unit. It calls for optimum utilization of this unit mandatory not only to increase revenues but also to curtail the cost and keep it within control.

With the changing economics of the operating room area in the past few years due to technological advances, payment based on diagnosis related groups, captivated payment and discounted fee for service have all significantly reduced margins in the surgical business. This area is therefore earmarked by many hospitals as a place to reduce expenses. Improvement in OR efficiency can have a major impact on hospital services and its financial management. The study aims to analyze the utilization of OT complex and to find out the turnaround time at each end in order to identify the bottlenecks.

METHODOLOGY

A retrospective cross sectional study was done over a period of two months from May to June 2018. Five OTs were selected for the study which included Gastro intestinal surgery OT, General Surgery OT, ENT OT, Urology OT and Pediatric Surgery OT. Relevant data was collected from OT and other concerned areas from the records and discussions with concerned personnel. For OT Utilization and the Recovery area utilization, the data was collected directly that included:

i) Time at which patient is brought inside pre-op recovery area – time of movement of patient from ward to pre-op recovery
ii) Time at which patient is taken out from pre-op to main OT
iii) Scheduled time of surgery
iv) Exact time of surgery
v) For how long the surgery took place
vi) When was the patient brought into post-op recovery area
vii) Time of movement of patient from post-op recovery to ward.

RESULTS

A total of 2450 surgical cases were scheduled in the concerned five OTs during the study period of three months. Out of them 2220 cases (90.6%) were operated while 230 cases (9.4%) were cancelled. Majority of the cases were operated under General surgery (24.5%) followed by Urology (23.4%). Cancellation rate was highest in General Surgery OT (27.8%) followed by Gastrointestinal surgery (20.4%). The average turnaround time was found to be 26 minute, 35 minutes, 29 minutes, 33 minutes and 27 minutes respectively. (Table 1)

Table 1. Number of cases in each Operation Theatre

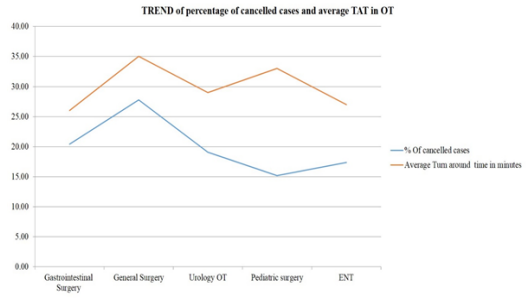
	Gastrointestinal Surgery OT	General Surgery OT	Urology OT	Pediatric Surgery OT	ENT OT
Total number of **operated cases** (n= 2220)	356	544	520	350	450
Number of **cancelled cases** (n=230) (9.4%)	47 (20.4%)	64 (27.8%)	44 (19.1%)	35 (15.2%)	40 (17.4%)
Average turnaround time (minutes)	26	35	29	33	27

The average utilization of Gastrointestinal OT, General Surgery OT, Urology OT, Pediatrics OT and ENT OT for the month of February to April was calculated to be 98%, 77%, 91.5%, 102% and 85.4% respectively (Table 2).

Table 2. Operation Theatre Utilization rate

Month wise OT utilization rate	Gastrointestinal Surgery OT	General Surgery OT	Urology OT	Pediatrics OT	ENT OT
February	104.3%	59.7%	92.3%	102.5%	74.6%
March	84%	73%	88%	107.6%	94.2%
April	105%	98.5%	94.2%	95.03%	87.5%
Average utilization	98%	77%	91.5%	102%	85.4%

FIGURE 1. Trend of percentage of cancelled cases in OT and the average turnaround time in OT



DISCUSSION

Donham and his colleagues defined "time utilization" as the quotient of hours of OT time actually used during elective resource hours and the actual number of elective resource hours available for use. [5] In the present study, process flow helped in understanding patient flow and various steps at which delay occurred that could be rectified. The average utilization of Gastrointestinal OT, General Surgery OT, Urology OT, Pediatrics OT and ENT OT for the month of February to April was calculated to be 98%, 77%, 91.5%, 102% and 85.4% respectively.

According to world literature, attainment of utilization levels between 70% and 80% is realistic and can meet variations in demand resulting from complications arising during procedures. [6-8]

Average of turnaround time in OT 10 is 26 minute, OT 11 is 35 minutes, OT 12 is 29 minutes, OT 14 is 33 minutes, OT 15 is 27 minutes, which is higher than the 20 minutes expected.

The delay observed was mainly attributable to the patient not received in OT on time. The reasons included patient not ready, FIC not cleared and longer time taken for shifting the patient from ward due to shortage of manpower. Next delay was observed in starting the induction due to reasons like pre induction preparation of patient, patient condition, shortage of anesthetist, a delay in receiving the patient, difficult in getting IV lines. A significant proportion of delays can be reduced by proper communication between OT nurse and ward nurse and also between various OT personnel.

Maintaining a written workflow protocol for each activity in OT, strict adherence and enforcement of approved policies and procedures are essential for efficient OT management. OT utilization must be analyzed and monitored every month. Documentation of all cases should be done properly and accurately. In order to achieve optimum utilization it is essential to identify the factors resulting in underutilization of facilities.

Surgical departments are always under scrutiny to cut waiting list and increase efficiency. They are also expected to improve services by bringing in both technical upgradation and specialized manpower. Shorter clean up time between two surgical cases is not recommended as it may compromise on cleanliness of the OT. Only a few cases listed in the scheduled list were seen to be cancelled in the study (9.4%). Unavailability of preanesthetic clearance was the major reason among such cases followed by excess time consumption by surgeries posted earlier in the day. Intraoperative complications are difficult to predict and it may lead to utilization of more time than stipulated for a particular case. In such instances, the last case for the day was found to be cancelled inadvertently. Depending upon the availability of free OTs and the urgency of the case, such cases can also be shifted to other OTs. Efficient utilization of OTs should be encouraged. [9] This needs an efficient OT manager who can take prompt and quick decisions. A robust OT scheduling forms the basic tool to reduce OT wastage. The different techniques of OT scheduling that have been used in the past in order to achieve hospitals' objectives and minimize the constraints are linear programming, heuristic algorithm, hybrid genetic algorithm and mixed integer linear programming. [10-12]

Michael B. Rose and David C. Davies stated that it is the OT capacity that often limits the amount of routine surgical work. [9] It is the responsibility of surgeons to ensure that OT facilities are used as fully as possible, and also that the operating time in the theatre is used optimally. [13] Routine operation should be listed in advance, so that each surgical unit knows its share of theatre time that can be used as fully as possible without any overtime extension.

According to Farooq and his colleagues utilization of theatre can be increased by proper scheduling of surgeries by anaesthetizing the patients in an anesthesia room instead of operating room and by laying of sterile trolleys in layup room instead of operating room. [14] Hartmann and Sunjka have mentioned in their study that if we measure utilization longitudinally it may be characteristic but it would typically vary from day to day, depending on caseload and the individual nature of procedures. [15]

CONCLUSION

Operation theatres being capital intensive area of a hospital needs optimum utilization. OT utilization study is an effective tool to identify and improve the shortcomings. In the present study OT utilization was found to be optimum but the turnaround time was not up to the mark. There were frequent delays noticed. The authors believe that optimum utilization can be achieved by good interaction between OT and hospital staff, and benchmarking of procedure timing to make effective scheduling of OT. Proper records need to be maintained and OT audits need to be carried out regularly. This can surely lead to optimum utilization with improved financial gains.

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