

Ophthalmic Theatre Time Utilization in a Nigerian Teaching Hospital

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ABSTRACT

Background: An audit of the utilization of the ophthalmic theatre time of the University of Nigeria Teaching Hospital, Enugu was conducted in order to identify the main factors hindering maximum utilization of the theatre, with a view to improving efficiency and effectiveness of the operating theatre team.

Methods: Data was collected prospectively over a period of 3 months (16th May -22nd August 2005). A total of 28 elective operation lists consisting of 47 eye surgeries was surveyed. Theatre time utilization was studied with respect to commencement and end of cases, turnover interval, start delay interval and main reasons for delays.

Results: A total of 57hrs 5mins (46.8% of total theatre time used) was spent on doing the actual surgeries and the turnover activities between cases. The total amount of time lost before the commencement of the lists was 64hrs 50mins (53.2% of total theatre time surveyed). Late arrival of operating theatre team personnel was noted to be the main single contributory cause of start delays, accounting for 32hrs 35mins of lost time.

Conclusion: The ophthalmic theatre time at our centre is grossly underutilized and measures aimed at reducing start delays and the logistic problems would help ensure optimal utilization of time and other resources.

KEYWORDS: Ophthalmic; Theatre time; Utilization; Audit.

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INTRODUCTION

The Global Initiative for the Elimination of Avoidable Blindness (Vision 2020: The Right to Sight) has set a major challenge to all stakeholders in eye care, which requires a significant increase in the provision and uptake of eye care services¹. The increasing pressure to eliminate avoidable blindness and clear cataract backlogs, particularly in the developing economies, has placed some emphasis on high volume high quality surgeries. This has become more imperative as improving patient care is rapidly becoming a priority for all health care providers. Apart from the quality of infrastructure and competence of the health personnel, the efficiency and effectiveness of the operational

systems greatly determine the quality of patient care. The operation theatre unit of any hospital represents an area of considerable expenditure in a hospital budget and requires maximal utilization to ensure optimum cost-benefit.² Improving the efficiency with which time and other resources are utilized is expected to result in an increase in the number of operations performed in any theatre over a period of time. This will result invariably in a reduction in the unit cost of surgery and the waiting list of operating theatres³, and thereby help improve access to surgical care. In view of the paucity of data in Nigeria on the utilization of the operation theatre, this particular audit of ophthalmic theatre time was undertaken to identify the main factors hindering maximum use of theatre time with a view to improving effectiveness and efficiency of the theatre unit in our hospital and other hospitals with similar scenario.

MATERIALS AND METHODS

The audit was done prospectively over a period of 3 months in the eye theatre of the Department of Ophthalmology, University of Nigeria Teaching Hospital, Enugu. All the elective ophthalmic operation lists were surveyed between 16th May and 22nd August, 2005. The Matrons in charge of the eye theatre collected the relevant information required, and at the end of the day, the records were crosschecked by the most senior surgeon present to ensure complete/correct entries. All the lists were scheduled to start by 9am. All cancelled lists or cases were not included in the study.

Study Variables

- Name
- Age
- Sex
- Ocular diagnosis
- Type of surgical procedure
- Type of anaesthesia used
- Number on operation list
- Time of commencement of surgery (minutes approximated to the nearest multiple of 5 i.e. 9.10am, 9.15am, 10.45am, etc)
- Time of completion of surgery (minutes approximated to the nearest multiple of 5 i.e. 9.10am, 9.15am, 10.45am, etc)
- Presence of delay before surgery

- Reasons for delay before surgery
- Turnover time between the respective surgeries on the operation list. (in hours and minutes)
- Date of surgery

Study Definitions

Commencement of Surgery A case was considered to start with the positioning of the drapes.

End of Surgery A case was considered to have ended with the removal of the drapes.

Turnover Time The time interval between the end of one case and the beginning of the next case. Within this interval, the operated patient is replaced by the next patient; nurses arrange for the instruments/materials for the next procedure; anaesthesia is given and the surgeons write their operation notes.

Starts Delay Delay in commencement of operation list scheduled for 9am prompt.

RESULTS

Twenty eight elective operation lists comprising 47 eye surgeries were studied. There was an average of 2 cases per list and only nine of the lists (32.1%) had children as patients. Fifteen operation lists (53.6%) included cataract surgeries, commonly extra capsular cataract extraction, as a procedure. General anaesthesia (G.A) was used in 22 of the cases (46.8%) and local anaesthesia in the remaining 25 cases (53.2%). The amount of time spent in the theatre within the 3 months of the study was 121 hours 55minutes. The average duration of each list was 4hrs 36minutes. The actual time used in conducting all the 47 surgeries was 47hrs 10minutes, approximately 38.7% of the total time spent in the eye theatre. The average time used per case was 1hr 12secs. The total turnover time was 9hrs 55mins, approximately 8.1% of the total theatre time. A total of 57hours 5mins (46.8%) was spent on both conducting the actual procedures and on the turnover activities. The total amount of time lost before the commencement of the lists (start delay time) was 64hrs 50mins (53.2%). Only 2(7.1%) out of the 28 lists studied did not have start delays. Various reasons were adduced for the start delays observed. (See Table I).

The longest start delay was that of the 14th list, which was 6hrs 15mins. The longest turnover time between cases was in the 9th consecutive operation list (2hrs 15mins), and the shortest was 5minutes, recorded in the 10th consecutive operation list. The modal turnover time was 30minutes. The longest operating time on a case was 2hrs 30mins (in the 17th list) and the shortest

operating time, 5minutes, was recorded in the 18th list. The maximum period used in theatre for any day was 8hrs 30mins (the 14th list), while 1hr 55mins was the least amount of time spent in theatre for any day.

Table I. Distribution of the 28 Operation Lists with Respect to main Reason for Start Delay and amount of Delay Time due to these factors

Main Reason for Start Delay of the operation list	Number of elective lists affected	% of the 28 lists	Start delay time due to reasons
Late arrival of the Ophthalmologists	9	32.1%	17hrs 20mins
Logistics i.e. nonavailability of oxygen, patients drugs, or theatre materials/sterile sets, no fuel for generator set	8	28.6%	24hrs 5mins
Patients-related factors i.e. late arrival of patient.	4	14.3%	8hrs 10mins
Late arrival of the anaesthesiologists	3	10.7%	9hrs
Late arrival of the theatre nurse	2	7.1%	6hrs 15mins
No delay	2	7.1%	0
Total	28	100%	64hrs 50mins

DISCUSSION

According to Gordon⁴, an objective and critical examination of all the factors that govern operational efficiency must be considered in order to increase productivity while minimizing wastage of resources and time. He suggested additional technology, efficient infrastructures, highly skilled employees and possibly increase in the number of these employees as ways of speeding up the service time. However, our audit of theatre time utilization shows that a greater proportion of the time was spent in getting ready for the commencement of the day's operation list than in actually doing the surgeries and running the turnover activities. The total start delay time of 64hrs 50mins (53.2% of the total time spent in the theatre) is indicative of an operational deficiency bordering on disregard for the scheduled time for commencement of surgeries or apparent/obvious lack of awareness about a recognized time for surgeries to commence. This was demonstrated by the finding that late arrival of the theatre personnel (Ophthalmologists, anaesthesiologists and theatre nurses) was noted to be main reason for start delay in 14 (53.9%) of the 26 elective lists with start delays, and this accounted for 32hours 35mins of lost time. This lost time is subject to control if all the members of the theatre team are made to agree on the scheduled time for commencement of surgeries, and also if measures i.e. sanctions are instituted to ensure punctuality to work. Making provisions for a standby operation theatre team may also help curtail the delays due to late arrival of any member of the team. Similar delays in commencement of surgeries due to late arrival of a member of operating

team or lack of a recognized time for commencement of surgery was also noted in other studies^{5,6}.

In order to shorten turnover time in the theatre, the theatre could be provided with another functioning operating table/operating microscope and more cataract surgical sets. With additional theatre nurses, instead of the present practice of having only one nurse on duty, someone can then be delegated to handle cleaning/sterilizing the instruments and preparing materials for the next case on the list.

The audit showed a modal turnover time of 30minutes, which is considered quite a long time for an ophthalmic theatre⁵. The observation that turnover times of 5mins and 10mins were achieved between some cases is a pointer to the fact that with proper planning and execution of the turnover activities, the turnover time can still be reduced to an acceptable level.

The start delays caused by logistic problems such as non availability of oxygen/theatre materials and surgical sets/patients' drugs and fuel for the generator set could be easily controlled by proper supervision/stock inventory by the matron-in-charge of the theatre, who also doubles as the eye theatre manager. Adequate budgeting provisions for these materials and provision of standby items/facilities would help cushion such delays or interruptions. There may also be need to have an anaesthetic technician or anaesthetist posted permanently to the eye theatre, instead of the present practice of having different persons working on different days. This would help ensure proper monitoring of all the materials required for anaesthesia. A similar study⁷ in Ibadan showed gross underutilization of emergency theatre space with the contributing factors mainly being human and preventable. As in our study, delays or cancellations in their audit were traceable to the surgeons not showing up (62%). Another study in India² also showed that delay in starting lists was a main factor accounting for inefficient use of operating theatre facilities. They were of the view that the correction of all the militating factors they observed in their study would increase the available operating time by nearly 20%. However, in the United Kingdom⁸, it was observed that the single largest cause of underutilization of the operating theatre time in a peripheral teaching surgical unit was understaffing, and as a means of increasing theatre utilization, they recommended higher levels of staffing and expenditure instead of changes in the working practices of surgeons.

Despite the incessant interruptions in power supply prevalent in our society, this was the main reason for start delays in our hospital due to the fact that the eye theatre has a dedicated portable generator set, that is accessible to the theatre team at all times. Frequent

maintenance check should be conducted on this set in order to improve efficiency and a second standby generator set should be acquired. Adequate fuel and oil supplies for this alternative means of power supply should always be ensured.

Late arrival of the patient to the operation theatre was also noted to be the main reason for the start delay of 4 of the surveyed operation lists. This situation may arise if patient does not complete payment of the hospital fees; eats against medical advice or if the eye ward personnel waste time in preparing the patient for transfer to the theatre. This factor can be controlled with proper education and orientation of the patients, theatre porters and ward personnel.

CONCLUSION

The Ophthalmic theatre time in our centre is grossly underutilized due to factors which are related to the theatre team (Ophthalmologist, anaesthesiologist and theatre nurse) and operational logistics. Measures aimed at reducing start delays, particularly strict adherence to an agreed scheduled time for commencement of surgeries, and resolving logistic problems are recommended. The establishment of a theatre management committee may help ensure optimal utilization of time and other resources in our eye theatres, and consequently promote high volume, high quality eye surgery.

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