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OPERATING THEATRE PERSONNEL'S PERCEPTION OF CAUSES OF DELAY IN COMMENCEMENT OF SURGICAL OPERATION IN A NIGERIAN TEACHING HOSPITAL

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Abstract

The delay in commencement of surgical intervention has been a source of distress and apprehension to patients and their relatives. The delay in preparation and subsequent surgical operation was associated with various factors with consequences on the patient surgical operation outcome in Theatres of University of Maiduguri Teaching Hospital (UMTH).

A descriptive study of cross-sectional design was adopted. The sampled population was operating Theatre personnel drawn from the Main Theatre and Obstetric theatre of UMTH. A researchers-designed questionnaire was used for data collection. The instrument validity was established by questionnaire content and the reliability was determined by a pilot study conducted at Umaru Shehu Ultra-modern Hospital Maiduguri with outcome of 0.8 reliability index. The respondents were purposively selected for the study and questionnaires administered on 60 respondents with the response rate of 100%. The data were analyzed using Statistical Package for Social Sciences (SPSS). One-way Analysis of Variance (ANOVA) and paired sample t-test was used to test the hypotheses in this study at 0.05 P value.

The findings showed majority (88.3%) of respondents opined that there was delay in commencing surgical operations and 91.7% of them noted that delay in starting surgical operation are due to several factors. Shortage of Theatre personnel, poor electricity supply and inadequate supply of equipment were identified as factors responsible for delay in starting surgical operations in the UMTH.

This study concluded that there is significant difference in the time of starting the surgery and the standard time adopted in the commencement of surgical operations in the University of Maiduguri Teaching Hospital operating theatres. We however, recommended that lack of Theatre facilities and poor work environment, delay in preparation and in starting surgical procedures in UMTH should be addressed by the hospital management to ensure smooth commencement of Theatre surgical operations for better patients care outcome.

Keyword: Delay, Perioperative delay, Surgical operation, Theatresurgical intervention, University of Maiduguri Teaching Hospital

Introduction

Delay in surgical operation is a situation in which surgical operations are not carried out early enough as planned. The delay in commencement of surgical operations is source of emotional and psychological disturbance to patients which has significant consequences on the perioperative process for surgical interventions (Basnet &

Sibakoti, 2012). It observed that delay in surgery could be reasons for poor patient surgical outcome and possibly contributed to surgical deaths especially in hip surgery (Novack, Jotkowitz and Etizon (2013). Wong (2009) opined that delays in the care of patient are a serious lassitude that remains unacceptable in the health care delivery system. This delay is worst when it has to do with

surgery, because the term surgical operation on its own is anxiety driven (Basnet & Sibakoti, 2012). Ideally, surgical patients are prepared very well and early that is, 10 to 15 minutes before surgical operation, either in the clinic or on the ward; this preparation is a collective responsibility of all the surgical team. Wong (2009) however, suggested that delay in surgical operation requires thorough documentation to provide a basis for development of solutions that will improve surgical operation efficiency.

Surgical intervention in disease management is traumatizing to the patients billed for surgical operations and their relations, particularly psychological trauma which may lead to anxiety-associated complications like exponential rise in blood pressure and deteriorating emotional conditions of the patient. Novack, Jotkowitz and Etizon, (2013) posited that there is a correlation between promptness of surgery and decrease in postoperative complications, for example, patients with hip fracture who were operated within 24 hours from admission have fewer complications and lowered mortality risk than those patients who had to be delayed for surgery (Bottle & Aylin, 2006; Librero, Peiró, Leutscher, Merlo, Bernal-Delgado, Ridao, Martinez-Lizaga & Sanfeliix-Gimeno, 2012). The delay that occurs in the operating theatre before or during surgical intervention has been attributed to human errors and system deficiencies by several studies, for example, Orosz, Hannan, Magazinner, Koval, Gilbert, Aufses, et al. (2002), observed that waiting to optimize the medical condition of the patient, delay in granting of consent by the patient, lack of theatre slots, delay in obtaining results of laboratory investigations, as well as unfavourable time of admission of patients are reasons for delaying surgery.

It has been reported in developing countries that there are increasing difficulties with the preparation of patients for emergency surgery and getting the patients to theatre within a time limit felt acceptable by the operating surgeon especially in Nigeria (Kingham, Kamara, Cherian, Gosselin, Simkins, Meissner, (2009) & Solabgeru, Duze, Kuranga, Adekanye, Afoegbu, Adelowo (2003). The difficulties in preparation of patients for emergency surgery are attributed to some factors; principal among them is unavailability of the surgeon and non-availability of instrument which

is the most commonly recorded reason for delay in operating room (Basnet & Sibakoti, 2012). Mbah, Opara & Agwu, 2006; Jonnalagadda, Walrond Hariharan, Walrond & Prasad, 2005), however, categorized factors associated with delayed in surgery into two with the first been patients-related factors, which were found to be contributory to physiological deterioration condition of the patient and the institutional inadequacies are contributory factors to poor post-surgical outcome. Kaderali (2009) also identified errors in the performance of task, contamination of instrument and missing of equipment or malfunctioning, and ineffective communication between members of the surgical operation team as contributing factors to delay in commencement of surgical operation.

Ifesanya, Adeleke, Ogundele, Olumuyiwa and Ifesanya, (2013) observed that the causes of delays within the hospital were due to unavailability of sufficient space in operating theatre, inadequate manpower, long queue due to other pending emergency cases and unavailability of surgical instruments which were used up either in elective cases or previous emergency cases and unscrupulous delays in the laboratory. Regardless of any factor responsible for the delay in commencement of surgical operations, significant number of patients suffer emotional and psychological trauma resulting from delay in surgical intervention. Simunovic, Devereaux and Bhandari (2011) noted that improper planning surgical intervention and/or staff unavailability at the surgical department increases patients and relations anxiety level and it is often a source of frustration for the surgical team members.

In other to proffer solution and reduce delays in surgical operations, Wong (2009) suggested that outpatient or day patient requires a reminder phone call a day before surgery to minimize the chance of patient arriving late on the day of surgery. The theatre should have an adequate number of dedicated porters that should be instituted at both the theatre and wards to reduce the delay associated with transporting patient to and from the operating theatre. There is need to enhance communication between ward and theatre staff, provide additional resource like adequate beds, operating suite and manpower such as nursing staff and anesthetists are very essential.

In University of Maiduguri Teaching Hospital

(UMTH), it was observed that delay in starting surgical operations on patients scheduled for surgical procedure has been a recurrent phenomenon in both the main and the obstetric Theatres. The delay in commencement of surgical operation was observed to be associated with patient not been prepared early and presented on time for surgery; the surgical team is sometimes not available for the surgical intervention. The most disturbing aspect is the increasing incidences of complications resulting from the post-surgery outcome in the UMTH. This study examines factors associated with delays in starting surgical intervention and determined the waiting time between diagnosis and commencement of surgical intervention on patients scheduled for surgical operations in UMTH.

Research Questions

1. What are the demographic distribution of the respondents
2. What are the views of the operating theatre personnel about starting time of first surgical case and patient waiting time in UMTH?
3. What is the theatre's surgical team perception about factors responsible for delay in commencement of surgical operations in UMTH Theatres?
4. What are the effects of delay in surgical operation on the patient operated on in UMTH?

The Hypothesis

- H_{02} There is no significant differences in the starting time of first case of surgical operation and the standard time for commencement of surgical operations in UMTH

Materials and Methods

This is a descriptive research using cross-sectional design to assess factor associated with delay in surgical operations at University of Maiduguri Teaching Hospital operating theatres. The University of Maiduguri Teaching Hospital the setting of this study is owned and managed by the Federal Government of Nigeria. The Hospital is located along Bama road in Maiduguri metropolis with a capacity of 530 beds spread over twenty wards. The mandates of the hospital like any

other tertiary health institution include training of health personnel, provision of health services and research.

The target populations for this study were surgeons, anesthetists and perioperative nurses working at the UMTH Main Theatre and Obstetrics Theatre. Stratified sampling method was used to select the respondents for the study; the population was divided into homogenous sub-group that is, the surgeons, perioperative nurses, and anesthetists. A proportionate sampling method was used to select respondents across professional line, that is, 25 surgeons, 24 perioperative nurses and 11 anesthetists given 60 respondents selected as study population.

A researchers-designed questionnaire was used for data collection on the respondents' demographic data, factors associated with delay in starting surgery and a modified Likert scale type was used to examine the opinions of three main professionals on the factors responsible for delay in starting surgery in the operating theatres. The content of the instrument were based on the respondents awareness about the delay in starting surgery, factors responsible for the delay in starting the surgery, these were pretested a pilot study in a similar setting, the result was analyzed and showed to have high degree of consistency at 0.8 reliability.

The ethical approval was sort from the research and ethical committee of the UMTH for the study and the approval letter was taken to managers of the Main theatre and Obstetrics Theatres for their notification. The informed consent was sort from the individual respondents. The data was collected through administration of questionnaire to the respondents by the researchers and two research assistants. The completed questionnaires were collected, sorted and tallied for statistical analyses within three weeks. Data analyses were done using the Statistical Package for Social Sciences (SPSS version 20). The Inferential statistics of one-way ANOVA was used to differentiate the opinions of the professionals working in the UMTH operating theatre and independent paired sample t-test was used to test the hypotheses of the study at 0.05 P value of significance.

Results.

Table 1: Demographic distribution of the respondents by sex, profession and length of service

Sex	Frequency	Percent
Female	16	26.7
Male	44	73.3
Total	60	100.0

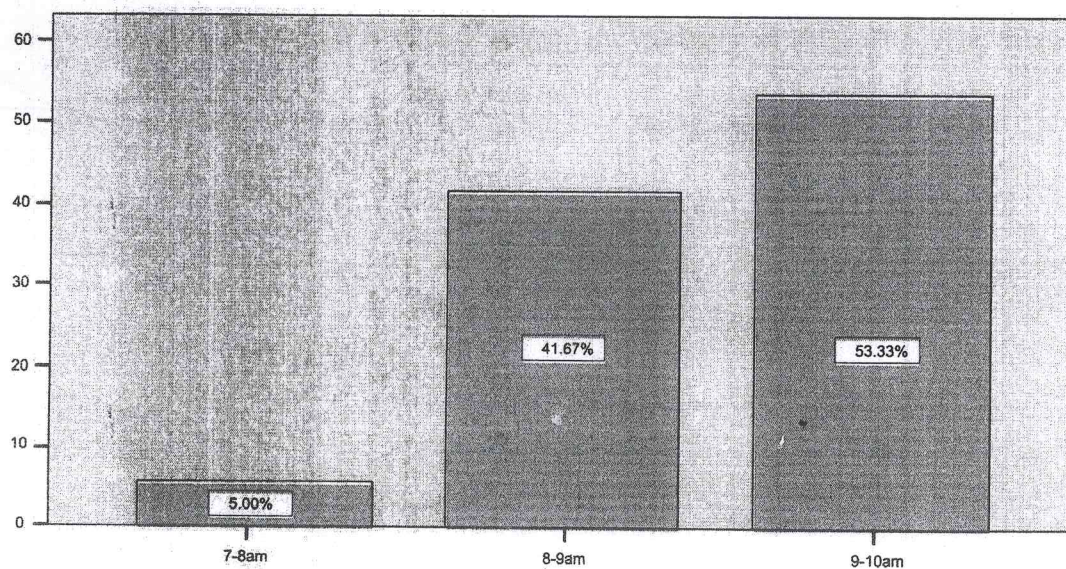
Profession of the respondents

Anesthetist	11	18.3
Doctor (Surgeon)	25	41.7
Perioperative Nurses	24	40.0
Total	60	100.0

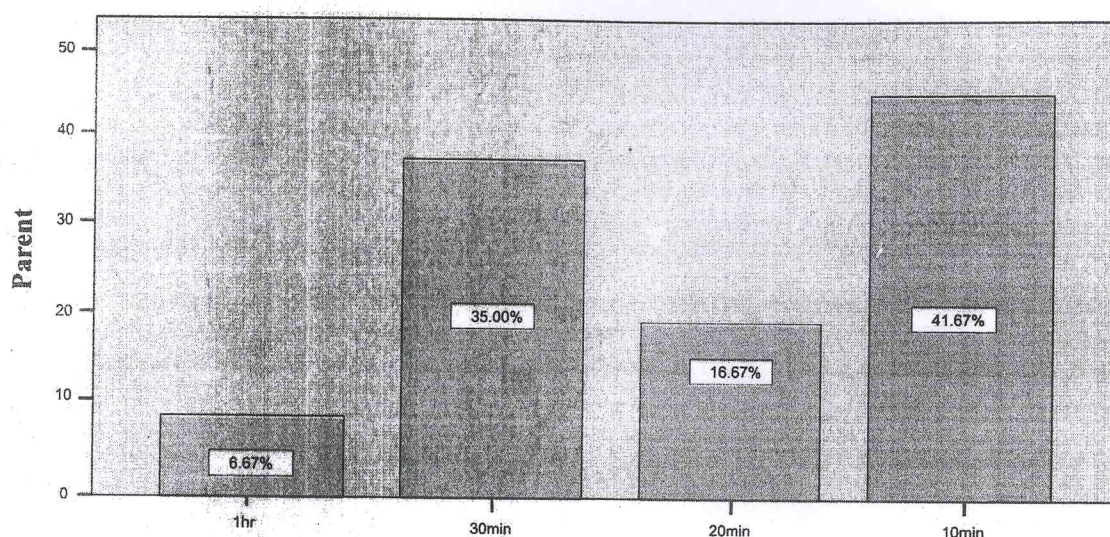
Respondent years of working experience

Less than 5 years of service	21	35.0
5 -10 years of service	15	25.0
11 years and above of service	24	40.0
Total	60	100.0

Table above revealed the respondents' sex, and Perioperative Nurses have almost equal professions, and work experiences. Predominantly percentage constituting the majority (41.7%) and the respondents were males (73.3%) and among (40.0%) against Anesthetists (18.3%). the three main professions in this study, Surgeons



Respondents view on time of starting the first case of the day



Respondents view on patients waiting time at the theatre reception

Fig.2

Fig. 1 and 2 revealed the respondents views about the time of starting the first case which was mainly at late hours (9-10 am) compared with their views about the patient waiting time in the theatre which was 10 minutes before the operation.

Table 2: Surgical team's opinion about Factors responsible for Delay in Starting Surgery in the Operating Theatres

The theatre Maid delay to clean the theatre

Anesthetist	6 54.5%	5 45.5%	0 .0%	11 100.0%
Surgeon	14 56.0%	10 40.0%	1 4.0%	25 100.0%
Perioperative Nurses	18 75.0%	6 25.0%	0 .0%	24 100.0%
Total	38 63.3%	21 35.0%	1 1.7%	60 100.0%

Table above shows varying opinions of the respondents based on their professional backgrounds on the factors responsible for delay in starting surgical operations in UMTH. Very few (5.0%) respondents opined that perioperative nurses delay in the preparation of Theatre suite was always responsible for the delay in commencement of surgical operations, however, on the delay in readiness of sterile pack as a cause of delay

in commencement of surgery, Half (50.0%) of respondents agreed that it sometimes causes delay, however, 68.0% of surgeons opined that delay in readiness of sterile packs is not always the causes of delay as against opinions of nurses and anesthetist. However, 31.7% of respondents especially among surgeons affirmed that the delay in commencement of surgery is not always due to delay in readiness of sterile pack.

The delay in arrival of the surgeon was viewed by 50.0% of respondents as always responsible for delay in starting surgery particularly among surgeons and anesthetists while, delay in Anesthetists taken the first case was viewed by almost all the respondents as sometimes causes the

delay in commencement of surgery in the Theatres of UMTH. The delay in preparation of the Theatre by the maids was considered by majority (63.3%) of respondents as not always the cause of delay in starting surgery in UMTH.

Table 3: Institutional based Factors associated with delay in commencement of surgical operation

Lack of functional air conditioning system in some suites				
Anesthetist	2	8	1	11
	18.2%	72.7%	9.1%	100.0%
Surgeon	8	12	5	25
	32.0%	48.0%	20.0%	100.0%
Perioperative Nurses	1	15	8	24
	4.2%	62.5%	33.3%	100.0%
Total	11	35	14	60
	18.3%	58.3%	23.3%	100.0%

Table above revealed other institutional factors associated with delay in starting surgical operations in UMTH such as lack adequate functioning air conditioners which sometimes (58.3%) impede early starting of operation in the Theatre followed by poor attitudes of staff to work (41.4%) were also sometimes responsible for delay in starting surgical operation. Majority (55.0% & 11.7%) of respondents particularly perioperative nurses

agreed that process of billing and payment delay the commencement of surgical operations, while pre-operative preparation of the patient was found by almost 52 percent of the respondents as not contributing to delay in surgical operations. This implied that factors outside Theatre units are equally contributor to the delay in starting surgical operation.

Table 4: Paired samples test of the respondents' reported time of starting surgery and the adopted standard time of starting surgery.

Paired Sample Test

	Paired Differences			Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	
reported surgery starting time - adopted standard surgery time	1.46667	.59565	.07690	.000

Hypothesis:

The hypothesis of the study was tested using the paired samples test of the respondent's opinion on the time of starting surgery in this hospital and the standard time adopted revealed that surgery time was greater than the adopted standard time of starting the surgery, mean difference of 1.4667 and the value of P is less than 5% ($P < 0.05$) as translated from 95% confidence interval. This implied that there is significant delay in theatre operation and therefore accepting the alternative hypothesis.

Discussion

The aim of this study was to examine the operating Theatre personnel's perception of causes and

factors associated with delay in commencement of surgical operation in University of Maiduguri Teaching Hospital. Majority of respondents were males among the three professions (Surgeon, Perioperative Nurses and Anesthetist) working in both operating theatres compared with the females. The gender distribution (predominantly male) respondents could probably be due to the nature of tasks associated with Theatre schedules which was primarily believed to be male oriented tasks. Among the professional groups, Surgeons and Perioperative Nurses constituted the majority against anesthetists. The respondents' working experiences in various disciplines was about 10 years working experience. These probably explained the quality of information provided

particularly on the factors associated with delay in starting surgery by the staff with long years of service. The findings of this study showed an appreciable level of views of respondents about delay in starting surgery in the UMTH especially on the time of starting the first case, they opined that the first case of surgical operation often commenced at late hours (9-10 am) compared with the patient waiting time in the theatre which was 10 minutes before the operation. The operations are not started on time. Equal number of respondents acknowledged that emergency surgeries are not carried out as booked when compared the starting of operation and patient waiting time in the two Theatres with the standard time adopted by the hospital. It was also opined that delay occurs on daily basis in the two theatres. The finding corroborate Basnet and Sibakoti (2012) study on various factors associated with delayed in surgical operation.

Generally, the respondents from the three professions affirmed that waiting for instrument and gown from the CSSD were major factors associated with delay in starting surgery. Although, there are varying opinions by the respondents on the factors responsible for delay in starting surgical operations in the University of Maiduguri Teaching Hospital, for example, more than half of the Anesthetists confirmed that shortage of manpower is one of the factors that contributed to delay in starting surgical operation, compare to the Surgeons and Perioperative Nurses whose opinions were that delay in process of patient paying the theatre bill and preparation of patients on the ward by nurses are the factors that contributed to the delay in commencement of theatre operations in the hospital. The differences in opinion are not unexpected because of the gross shortage of Anesthetists in UMTH, as Surgeons and Perioperative Nurses are significantly more than the Anesthetists among the surgical team members in the UMT Hospital. Other factors identified of equal magnitude, includes waiting for the surgeons and the anesthetists to arrive at the theatre; lack of functioning air-conditioner system in some of the operating suites and poor staff attitude to work are found to be associated with delay in surgical operations in the two Theatres of UMTH respectively.

These findings agreed with Mohammed (2005) position that the second most commonly recorded

reason for delay in operating room was the unavailability of instrument and unavailability of the surgeons respectively. Mohammed further clarified that first cases probably has higher incidence of delay than subsequent cases because of preparation to start, an increase demand on the service of the clerks during the registration of patient, the imaging department, the nurses in the holding area and hospital porters. However, Overdyk, Harders and Colleagues (2009) and Wong (2009) argued that operating room delays are linked to delays resulting from turn over between surgeries, admission into Post Anesthesia Care Unit (PACU) and non-operative time compensation for the personnel in the Hospital.

It could equally be assumed that some of the factors identified in this study were linked in such a way that delay in one aspect subsequently affect the other. For example, it was observed that waiting for items from Central Supply and Sterilization Department (CSSD) has links with delay in supplies from laundry department. This is because the laundry service unit must supply the CSSD with clean materials (Gowns and Drapes), before the CSSD can work. Similarly, the laundry department relied on the availability of electricity to power the laundry machines; hence, absence of electricity in these units will interfere with the surgical operations. These chains of problem need to be wholesomely addressed to enable efficiency in each segment of the Hospital. According to Basnet and Sibakoti (2012), most of the causes of delay in theatres were multifactorial and the most common cause was unavailability of operation theatre suits either because the theatre was busy with elective cases during the day time, long queue due to other pending emergency cases and unavailability of instruments which were used up either in elective cases or previous emergency cases.

Majority of the respondents acknowledged that emergency surgeries are not carried out as scheduled due to delays which occur on daily basis in the two theatres. Most surgical operations are conducted behind schedule of operation with consequent implications on patient care outcome. The hypothesis of this study which revealed that there is significant delay in the starting of surgical operation compared with the patient waiting time in the Hospital implies that several factors, such as delay in theatre facilities been put in place by

Theatre nurses, Surgeons and Anesthetists not on ground for patient preparation and subsequent surgery are determinants of the delay in starting surgical operations in UMTH. The above findings were in agreement with Pamela (1991) and American Society of Anesthesiologists' guidelines on early preparation of patient and preoperative fasting. This study also revealed several factors that are institutional based that are associated with delay in starting surgical operations in UMTH. Principal among these factors are lack of adequate functioning air conditioners in the Theatre and process of billing and payment causes delay in the commencement of surgical operations. This implied that factors within and outside Theatre units are equally contributory to the delay in starting surgical operation in UMTH. This finding is in agreement with the results of studies that revealed that factors found to be responsible for delay in starting surgical operation could be both patients' related factors

On the effect of delay in starting the surgery on the patient, the respondents opined that delay in surgery has far reaching negative effect on both physical and psychological domain of the patient. The delay in surgical operation demoralized the psychic of both the patient and the relatives which may lead to poor outcome of the operation. Kaderali and Won (2009) agreed that delays in the operating room negatively affect both patient and health care team members, and as such delays are sign of imperfection system. Bottle and Aylin (2006), Librerio et al (2012) studies also agreed with the findings of this study that if patients with fracture were operated within 24 hours from admission they have fewer complications and lowered mortality risk than those patients who had to wait longer time for surgery. This finding is in agreement with the results of studies that revealed that factors found to be responsible for delay in starting surgical operation could be both patients' related factors and institutional inadequacies that have contributed to physiological deterioration of the patient as well as poor post-surgical outcome (Mbah, Opara, & Agwu, 2006; Jonnalagadda, Walrond Hariharan, Walrond & Prasad, 2005).

The result of this study has far reaching implications to nursing as a profession as this study will create awareness on nursing staff in preoperative circle to be able to render a cost effective care to patient

that are billed for operation. Preoperative patient education could be plan and given at appropriate time to reduce patient fear and anxiety related to operation. The main problem of delay linked with nursing staff in the CSSD can be averted as nurses/staff working in this unit will be aware of the associated problems of delays in surgical operations and take precautionary measures to guide against delay in the perioperative processes. Most of the factors identified could be managed by Nurse Managers as well as other stakeholders in the operating theatre.

Conclusion

Based on the findings of this study, it was concluded that there is significant difference in the time of starting the surgery and patient waiting time compared with the standard time adopted in starting surgical operation in the University of Maiduguri Teaching Hospital operating theatres. This conclusion implies that there is delay in commencement of surgery in the two theatres of UMTH due to various challenges confronting the Theatre operation team.

Recommendations

Based on the conclusion of this study to avert delay in starting surgery in the UMTH theatres there should be an urgent need for the management to employ more staff to mane various aspects of theatre, supply of quality and adequate equipment to facilitate preparation for surgical operations, improve electricity supply to enable necessary equipment to function maximally. It was also suggested that the management of the hospital should ensure close supervision by heads of various units. Other measures includes, improve harmonious working relationship among the staff in the UMTH theatre, self-discipline, staff promotion, punctuality to work and timely supply of sterile surgical pack/surgical gowns. Payment of surgical bill should be made a day before the operation. The theatre should have an adequate number of dedicated porters that should be instituted at both the theatre and wards to reduce the delay associated with transporting patient to and from the operating theatre. There is need to develop a transparent system to monitor efficiency and to provide an effective communication between surgical ward and theatre staff. Furthermore, delays due to financial constraints can be overcome with formulation of short term credit facility for needy patients who

will be required to reimburse before discharge. Unscrupulous delays in the laboratory can also be overcome with efficient supervision and maintenance of good communication and dispatch network. Efficient use of available manpower can reduce the delays due to simultaneously running academic activities and other theatres.

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Conflict of interest: there is no conflict of interest

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