

## Original Research Article


# Delay in starting operation theatres in a teaching hospital - Opinion based study

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## Abstract

**Background:** Delay in starting operation theatre may lead to an unhealthy working environment, increased stress, considerable wait time for operation room (OR) staff as well as patient, and waste of resources. All these eventually affect the quality of care. With these considerations a prospective randomized opinion based study was conducted on 120 healthcare persons, 40 each belonging to the department of anesthesia, surgery, and nursing.

**Objective:** To assess the different perspectives of healthcare persons belonging to three major departments that function in concert for the smooth working of ORs; concerning various causative factors leading to delay.

**Materials and methods:** A questionnaire with ten most probable causes was distributed to the study subjects, seeking the five main reasons for usual delays as per their perspective. The data was compiled systematically and was subjected to Epi info software for surveys using the coding method for each option.

**Results:** The three most common reasons for the delay in the start of operating rooms according to Anesthetists were delay in the arrival of surgery consultant (65%), limited availability of trained supporting staff (57.5%), and equipment problem (52.5%). According to Surgeons they were lack of teamwork (57.5%), limited availability of trained staff (55%), and equipment problem (50%), and as per nursing staffs they were delay in the arrival of surgery consultant (71.7%), limited availability of trained staff (46.1%), and equipment failure (41%). Thus, the limited availability of trained staff, equipment, and punctuality problems may be considered the most common causes of delay in starting the operation theatre in our setup.

**Conclusion:** The study suggests that the leading causes of the delay are avoidable and there is a wide scope to improve in the timely starting operation room.

## Key words

Delay, Operative, Perspectives, Start time.

## Introduction

Optimal use of time and resources is a must to improve the quality of health care. Anesthetist's prime workplace is the operating room (OR) [1]. He often holds the prestige and pride of OR in charge. He heads the responsibility, and hence owes the credit as well as the discredit for the functioning of operation theatre (OT). Any contravene in the normal working of OR directly or indirectly reflects on Anesthetists [2]. Hence we conducted this questionnaire-based study to underline the major causative factors leading to delay in starting ORs. The data so obtained was utilized to devise strategic protocols for improvements at our institution as improvement is facilitated by regularly reviewing performance, designing interventions to improve, and then implementing them [3].

## Case report

This study was conducted in the year 2012 at Gandhi Medical College, Bhopal, Madhya Pradesh. We designed a questionnaire including ten key reasons of the most probable causes which lead to delay in starting the operations in OR. For the study purpose, we defined delay in starting OT- as delay in starting the surgery i.e. surgical incision time from the expected time (perceptive), in a normal or uncomplicated case. After obtaining permission from the respective departmental heads, 120 questionnaires were distributed at random, 40 each to the respective consultant and residents of Department of Anesthesiology, Surgery (10 each from the department of General Surgery, ENT, Orthopedics, and Obstetrics and Gynecology), and nursing staff posted in various OR of the hospitals associated with our institution. The permission from the ethical committee for the study was not desired. The study groups were as follows - Group A (n=40): comprised of Anesthetists. Group N (n=40): comprised of nursing staff. Group S (n=40): comprised of surgeons. The randomization was done by

choosing random days via a closed envelop method during which all those probable subjects of respective departments posted in OT who were interested in participating in the study were asked to fill the questionnaire. Each participant was assured of the nondisclosure of identity and consented for voluntary participation. The exclusion criteria were the unwillingness to participate in the study. The participants were asked to choose amongst the ten enlisted options, the five most important causes of delay in starting OT, in the sequence of their priority. The procured data was recorded, tabulated, and analyzed subjecting it to Epi info software for surveys using the coding method for each option.

## Results

The response rate was 99.16%, one nursing staff did not return the questionnaire, hence excluded from the study. For the final tabulation of data and analysis of results, 119 questionnaires were considered. Demographically three groups were similar and comparable concerning age distribution (**Table – 1**), but the gender-wise nursing group for obvious reasons had more females (**Table – 2**).

**Table – 1:** Age distribution.

Age (in years)	Group A	Group N	Group S
20-30	27	22	31
31-40	7	12	6
41-50	5	3	1
51-60	1	2	2
Total	40	39	40

**Table – 2:** Sex distribution.

Gender	Group A N (%)	Group S N (%)	Group N N (%)
Male	17 (42.5%)	25 (62.5%)	6 (15.4%)
Female	23 (57.5%)	15 (37.5%)	33 (84.6%)
Total	40	40	39

The first option (**Table – 3**), marked by a majority of Group A subjects (50%) was a delay

in the arrival of surgery consultant and equipment failure whereas most of Group N and S subjects marked it to be equipment failure (35.9% and 25% respectively). The second most common reason (**Table – 3**), according to 27.5%

of Group A was limited trained staff, whereas 41% of Group N felt it to be a delay in the arrival of surgery consultant, although 47.5% of Group S believed it to be because of lack of teamwork (25%) and limited trained staff (22.5%).

**Table – 3:** Opinion.

Reasons	First Option			Second Option			Third Option			Fourth Option			Fifth Option		
	Grp A n (%)	Grp N n (%)	Grp S n (%)	Grp A n (%)	Grp N n (%)	Grp S n (%)	Grp A n (%)	Grp N n (%)	Grp S n (%)	Grp A n (%)	Grp N n (%)	Grp S n (%)	Grp A n (%)	Grp N n (%)	Grp S n (%)
1*	9 (22.5)	14 (35.5)	10 (25)	6 (15)	1 (2.6)	3 (7.5)	6 (12.5)	1 (2.6)	7 (17.5)	8 (20)	5 (12.8)	5 (12.5)	3 (7.5)	8 (20.0)	7 (17.5)
2*	4 (10)	6 (15.5)	6 (15)	3 (7.5)	8 (20.5)	10 (25)	2 (5)	1 (2.6)	7 (17.5)	7 (17.5)	4 (10.3)	4 (10)	7 (17.5)	1 (2.6)	2 (5)
3*	8 (20)	2 (5.1)	8 (20)	11 (27.5)	7 (17.9)	9 (22.5)	4 (10)	9 (23.1)	5 (12.5)	2 (5)	2 (5.1)	9 (22.5)	5 (12.5)	8 (20.5)	1 (2.5)
4*	11 (27.5)	5 (12.8)	0 (0)	10 (25)	16 (41)	2 (5)	5 (12.5)	7 (17.9)	4 (10)	4 (10)	3 (7.7)	1 (2.5)	5 (12.5)	1 (2.6)	7 (17.5)
5*	2 (5)	1 (2.6)	5 (12.5)	3 (7.5)	4 (10.3)	5 (12.5)	7 (17.5)	3 (7.7)	4 (10)	2 (5)	4 (10.3)	8 (20)	5 (12.5)	1 (2.5)	4 (10)
6*	2 (5)	7 (17.9)	3 (7.5)	0 (0)	2 (5.1)	3 (7.5)	0 (0)	2 (5.1)	2 (5)	2 (5)	3 (7.7)	0 (0)	1 (2.5)	0 (0)	4 (10)
7*	1 (2.5)	2 (5.1)	1 (2.5)	3 (7.5)	0 (0)	3 (7.5)	8 (20)	13 (33.3)	7 (17.5)	7 (17.5)	3 (7.7)	3 (7.5)	4 (10)	3 (7.7)	5 (12.5)
8*	3 (7.5)	2 (5.1)	5 (12.5)	3 (7.5)	0 (0)	2 (5)	4 (10)	2 (5.1)	2 (5)	2 (5)	10 (25.6)	10 (25)	4 (10)	3 (7.7)	2 (5)
9*	0 (0)	0 (0)	0 (0)	1 (2.5)	1 (2.5)	2 (5)	1 (2.5)	0 (0)	1 (2.5)	1 (2.5)	4 (10.3)	0 (0)	2 (5)	3 (7.7)	1 (2.5)
10*	0 (0)	0 (0)	2 (5)	0 (0)	0 (0)	1 (2.5)	4 (10)	1 (2.6)	1 (2.5)	5 (12.5)	1 (2.6)	0 (0)	4 (10)	11 (28.2)	7 (17.5)

Legend: \*- refer to Table - 4 for the respective reasons for the delay in starting OT.

**Table – 4:** Reasons of delay in starting OT.

Reasons	Group A		Group N		Group S	
	n	%	n	%	n	%
1. Equip problem	21	52.5	16	41.02	20	50.0
2. Lack of team work	9	22.5	15	38.46	23	57.5
3. Limited trained staff	23	57.5	18	46.15	22	55.0
4. Delay arrival surgery consultant.	26	65.0	28	71.79	6	15.0
5. Communication gap.	12	30.0	8	20.51	14	35.0
6. Delay anaesthesia consultant	2	5.0	11	28.20	8	20.0
7. Improper planning	4	10.0	15	38.46	11	27.5
8. More time pt. preparation	6	15.0	4	10.25	9	22.5
9. Noncompliance of PAC orders.	3	7.5	5	12.82	3	7.5
10. Improper pt. preparation pre op	9	22.5	2	5.12	4	10.0

The third most common cause for delay (**Table – 3**), marked by a majority of Anesthetist (20%) and Nursing staff (33.3%) was improper planning, whereas an equal number (17.5%) of Surgeons marked for equipment problems, lack of teamwork, and improper planning as a third

most common reason for delay. The data obtained when compiled individually for each option for the first three most common reasons for delay (**Table – 4**) according to Anesthetists were delays in the arrival of surgery consultants (65%), limited availability of trained supporting

staff (57.5%), and equipment problems (52.5%). According to Surgeons they were lack of teamwork (57.5%), limited availability of trained staff (55%), and equipment problem (50%), whereas according to Nursing staff they were delay in the arrival of surgery consultant (71.7%), limited availability of trained staff (46.1%), and equipment failure (41%). Thus, limited availability of trained staff, equipment problems, and unpunctuality may be considered to be the most common causes of delay in starting the OT in our setup as per the present study.

## Discussion

The operating room (OR) is a cost-intensive environment and should be managed efficiently [1]. To rationalize the high cost of running operation theatre (OT), full utilization of manpower and other available resources is a must. The OR time waste has been defined as that time in which the scheduled OT was not busy with the scheduled patient [2]. David et al noted that only 6% lists started within 5 min of the scheduled time, causing unnecessary delay [3]. Other authors have also quoted delay in starting operations from the scheduled time [2, 4, 5]. Delays lead to the cancellation of scheduled surgery with significant stress on the patient who was mentally prepared for surgery for so many days [6]. Unanticipated postponement on the day of surgery is a tremendous emotional as well as economical trauma for such patients in addition to causing an increase in OT costs and a decrease in its efficiency [7]. Avoiding unnecessary delays in starting the first and subsequent cases in OT is important for optimal utilization of time and resources. It also helps in setting the pace of OR, building up of cordial OR environment, and above all reputation of Anesthetists when they are OT supervisors. Delay in the first surgery of the day leads to significantly more delays in 2<sup>nd</sup> and 3<sup>rd</sup> surgeries [8]. The majority of the previous studies investigating the reasons for the delay in induction have set target or benchmark times for anesthesia induction and surgical preparation [9, 10]. The present study to the

contrary was opinion based involving different perspectives of OR doctors and nurses similar to that by Gupta, et al. [11]. In their study 60% anesthetist opined that noncompliance of PAC orders as the major reason for start time delay, whereas in the present study only 12.5% anesthetist felt so. The difference may be attributed to the difference in the routine departmental protocols. Delays due to the late arrival of surgery consultant leading to the cancellation of booked cases as one of the causes of delays have also been reported by other studies [9, 12, 13]. Haiart, et al. in their study have quoted 94% of start time delay due to surgeons [14]. However, Farrukh, et al. and Harders, et al. attribute only 5.02% and 6% respectively as the cause for the delay due to anesthetists and surgeons [6, 15]. This delay can be easily overcome by introducing the attendance system and making sure that all the concerned personnel assembles on time inside OT [6]. The presence of a consultant surgeon at the start of the list will likely decrease delay, both at the start of the list and during it [3]. In the present study, another important cause of delay was the limited availability of trained staff. In the survey by Gupta, et al. 34% anesthetists, 45% surgeons, and 60% of nurses feel this to be the cause of start time delay [11]. Supporting staff is always required for assisting OT equipment and instrument preparation, shifting and positioning of the patient, cleaning, and many other activities. These are usually not trained for working in the area of expertise like OT with complicated sensitive instruments and strict sterility protocols. Regular training and posting of only trained staff for OT are essential. Their organization for hectic early morning hours is also necessary. Janice et al have correctly pointed out that the first case arrival at all OTs is about the same time giving rise to bottleneck situation early in the morning because the number of supporting staff remains constant throughout the day [8]. Equipment failure has also been attributed to one of the major problems in other studies [10]. This might be due to advancements in technology and frequent usage of sensitive technically demanding equipment

like fiberoptics, laparoscopes, endoscopes, invasive monitoring, etc. All these require expert and delicate handling with maintenance and also require more time for setup. Other authors have quoted 10 - 57.9% as equipment failure to be the cause of delay [8, 15]. At least one equipment failure was noted in 38.8% of endoscopic gynecologic surgery [16]. This suggests that all required equipment should be thoroughly checked beforehand and the concerned supporting staff should be abreast beforehand with their functioning. Simultaneous discussion of the same with the surgeon, concerned nurse, and/ or anesthetist whosoever involved in the case, a day before surgery may add to extra comfort and smooth running of the OR. A good theatre manager can improve scheduling by better handling of available resources [2, 6]. Although it may not be possible to accommodate an extra case in the time salvaged in avoiding delays still this may be used for other purposes by the surgeons, anesthetists, and others, such as extra-operative patient care, teaching, and research work [8]. This may also be utilized for proper record keeping and other personal works. The outcome being an overall improvement in quality care and doctors' satisfaction. There are both avoidable and unavoidable causes for delay, the present study points out that most of the causes of delay are potentially rectifiable. The efforts to correct these problems provide additional opportunities to improve efficiency [10, 15]. The present study included a set of reasons to facilitate comparison without scope to include other possible options, this was one of the major limitations of the study. Another limitation was its perspective design which may carry personal bias. Different authors have identified varying causes for delays reflecting the variability in system protocols at individual hospitals. This emphasizes the importance of devising strategic protocols for the individual departments based on respective needs and work culture. It also highlights the importance of carrying out such surveys individually and not just trying to implement improvising formulas suggested by others. We achieved improvements in operating room efficiency after analyzing the

causes as indicated by the present study by incorporating improvising measures in the existent protocols.

## Conclusion

Improved inter-departmental co-ordination, regular training of operating room staff, personal accountability, interdisciplinary teamwork, transparent communication, and devising strategies for minimizing the common causes of delay in the start of OT is needed for improving OR efficiency.

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