

DOI: <https://doi.org/10.33314/jnhrc.v18i2.1951>

# Cancellation of Elective General Surgical Operations on the Day of Surgery

Om Bahadur Karki,<sup>1</sup> Niranjan Kumar Hazra,<sup>1</sup> Bishwodeep Timilsina<sup>1</sup>

<sup>1</sup>Department of Surgery, Manipal College of Medical Sciences, Pokhara, Nepal.

## ABSTRACT

**Background:** Unanticipated cancellation of scheduled elective operations decreases theatre efficiency and is inconvenient to the patients, their families and the medical teams. It creates logistic and financial burden associated with extended hospital stay and repetitions of pre-operative preparations. The aim of this study is to determine the incidence and causes of cancellation of surgical operations in our centre and make recommendations to reduce it.

**Methods:** This was a prospective cross-sectional study carried out over a period of one year in Manipal Teaching Hospital, Pokhara from July 2017 to June 2018. Consecutive sampling method was used. All patients booked for elective surgical procedures were enrolled in the study. The age, gender, diagnosis, proposed surgery and reasons for cancellation were documented and analysed.

**Results:** A total of 794 patients were scheduled for elective surgical operations during the study period and 86 (10.83%) patients' operations were cancelled. There were 54 (62.79%) males and 32 (37.20%) females. Recent change in the medical status of the patient (n=18; 20.9%) was the main reason for cancellation of operation followed by overbooking (n=11; 12.7%), change in plan of management (n=9, 10.4%).

**Conclusions:** Avoidable factors are mainly responsible for cancellation of surgeries. Efficient management, pre-operative assessment, utilization of the few available hospital resources, improvement in communication between medical teams and patients would reduce the rate of cancellation of booked surgical procedures.

**Keywords:** Cancellation; efficient management; elective operation.

## INTRODUCTION

Elective surgery is an important part of hospital's workload. Many patients who are called for operation from waiting list are not operated upon.<sup>1</sup> It is a world-wide problem with incidence of 0.37 to 28% in developed and 11 to 44% in developing countries.<sup>2,3</sup> An efficient surgical service should have a low rate of cancellation of operations. If operations are cancelled, the operation theatres (OT) are underused, waiting list increases, resources will be wasted and cost rises.<sup>4</sup> It may cause depression and annoyance on patients and their families because of extra expenditure, disruption of daily life and inconvenience.<sup>4,6</sup>

Major reasons for cancellation of operation include: failure of admission, inadequate work-up, overbooking, lack of staff, lack of equipments, management and anesthesia related factors.<sup>6,7</sup> Most of these factors are avoidable.<sup>8,9</sup>

The aim is to evaluate the incidence and reasons of

surgery cancellations scheduled on the day of surgery and to suggest appropriate recommendation.

## METHODS

A prospective hospital-based cross-sectional study was conducted in department of General Surgery, Manipal Teaching Hospital, which is a tertiary referral 750 bedded hospital located in Phulbari-11, Pokhara, Nepal. Consecutive sampling method was used. The operation list was prepared by the surgeons before 4 o'clock in the afternoon on working days. Surgery consultants/residents refer the patient to be posted for elective operation to the pre-anesthesia clinic for evaluation by anesthesiologist or anesthesia residents. Patients who were immobile/bed ridden were assessed in the ward itself.

All patients who admitted to Manipal Teaching Hospital, Pokhara, Nepal for elective general surgical procedures from July 1st 2017 to 30th June 2018 were the study population. All patients who were scheduled to undergo

**Correspondence:** Om Bahadur Karki, Department of Surgery, Manipal College of Medical Sciences, Pokhara, Nepal. Email: [karki10@gmail.com](mailto:karki10@gmail.com), Phone: +9779846080576.

routine elective general surgical operation, but due to some reasons surgery was cancelled on that day were included. Patients excluded from the study were patients scheduled in a minor operating room for minor surgery under local anesthesia; all emergency cases and patients planned for surgery from other units like neurosurgery, urosurgery and other departments.

Operative cancellations were defined as those patients who were scheduled in the operative list, were admitted for operation, but did not have the planned surgery on the intended date. The reasons for cancellation were categorized as hospital-related, surgeon-related, patient related and anesthetist related factors.

Hospital related factors included lack of theatre space, equipment failure/shortage, lack of theatre staffs. Surgeon related factors were change in plan of treatment, overbooking, surgeon not available/on leave. Similarly not inadequate patient preparation, financial constraints and patient not consenting for surgery were related to patient. Worsening in medical status of patient making him/her unfit for anesthesia, abnormal laboratory reports, shortage of anesthetist and failure of anesthesia were few anesthetist related factors.

Structured proforma was used. Data about cancellations of elective surgery were collected from the scheduled list for operation, operating theatres case log books, and patient medical records. The causes for cancellation were provided by either the surgeon or the resident and prospectively recorded into the computerized database. The assigned OT staff confirmed the cancellation reason and added additional explanation if necessary

Ethical clearance and permission were obtained from Institutional review board of Manipal Teaching hospital.

The data were checked, cleared, entered and analysed by using SPSS version (20.0).

## RESULTS

During the study period, 794 patients scheduled to undergo elective general surgical procedures and who met the inclusion and exclusion criteria were included. Of these, 636(80.10%) patients were operated on while the remaining 86 patients' procedures were cancelled on the day of surgery for various reasons, giving a cancellation rate of 10.83%. The operation theatre was functional for 266 days during the study period for taking up the elective cases resulting in 2.39 cases per day in which either general or regional anesthesia was required.

Among the scheduled operation cancelled patients, 54(62.79%) males and females were 32 (37.20%) with a

male to female ratio of 1.68:1

The reasons for cancellation were grouped into anesthesia related, patient related, surgeon related, and administrative related. Recent change in medical status of patient making him/her unfit for anesthesia (n=18; 20.9%) was the major cause of cancellation. (Table 1).

**Table 1. Causes of cancellation of elective general surgery operations.**

Causes of Cancellation	Number of patients	Percentage
<b>Anesthesia related (n=31)</b>		
Lack of anesthesiologist	2	2.3
Failure of anesthesia	4	4.6
Change in medical status of patient	18	20.9
Abnormal laboratory results	7	8.1
<b>Surgeon related (n=24)</b>		
Change in plan	9	10.4
Overbooking	11	12.7
Surgeon not available	4	4.6
<b>Patient related (n=15)</b>		
Not fasting/improper preparation	9	10.4
Did not consent	3	3.4
Financial constraints	3	3.4
<b>Administrative related (n=16)</b>		
Lack of theatre space and facilities	4	4.6
Equipment failure/nonavailable	6	6.9
Inadequate theatre staffs	1	2.3
Delayed reports	5	5.8

The anaesthetist cancelled the operations in 30(34.88%) and surgeons in 24(27.90%). Only 18.6% (n=16) of cancellation were due to organizational reasons. No operations were cancelled because of lack of bed in intensive care unit or surgery postoperative ward.

## DISCUSSION

Elective surgical operations require a major organizational effort between surgical team, theatre staff and hospital administration. Cancellation of booked elective surgeries is a common problem across all hospitals in our country and around the world.<sup>1,3,10</sup> It carries a major cost implication to the hospitals because of wasted hospital resources, increases waiting period for the patients, frustration and mental stress to the

patients and their families who plan their working and family lives around postponed date of operation.<sup>1,4</sup> Most operations are cancelled at 24-hour notice.<sup>4,11,12</sup>

The reported incidences for elective surgery cancellation vary widely among institutions from 1 to 40%.<sup>12,13</sup>

In agreement with other studies, our study found a significantly higher rate of cancellations among males than females.<sup>4,11-13</sup> This is contrary to Garg et al. who reported higher cancellation rates among females than in males.<sup>14</sup> Gonzalez-Arevalo et al. reported no gender differences. We could not establish the reasons for the gender differences.

The explanations for these higher cancellation rates are multi-factorial. The main reasons in our study were: patients' medical conditions, overbooking of lists, and facility shortage of essential theatre facilities. Failure of patients to turn up for admission to hospital for elective surgery was an important reason for fewer elective cases than scheduled. Reasons could be their change of mind on treatment modality, familial constraints, financial reasons etc.

Shortage of operating time was also an important factor. Most of the OT time is wasted due to late starts, time between cases, preparation and cleaning operation theatres, and delayed transportation of patients to operation theatre. However this can be reduced by efficient management like on-time start of the first case of the day, setting-upon anaesthesia equipment and setting of case trolleys performed in parallel.<sup>12,15</sup>

Schofield et al in their study of cancellation of intended surgery at a major hospital in Australia reported 941 (11.9%) cancellations out of 7913 theatre sessions. The reasons included no bed available (18.9%), run out of theatre time (16.1%), patient non-arrival (10.5%), patient unfit (9.2%), and cancelled by patient or relatives (8.2%).<sup>5</sup>

Vinukondaiah et al cited the major reasons for cancellation of cases in the general surgery to be lack of operating time (65.2%), emergency surgery during the elective list (13.9%), and lack of fitness (11.3%).<sup>16</sup>

Unplanned admissions and lengthy OT lists prepared by junior surgeons, who were not familiar with the procedure, was also a reason for cancellation of operations. Many patients did not need surgery or required further work up before surgery. An analysis in USA examining 56,000 cases retrospectively found that 31% of lists were predictably overbooked.<sup>5,14</sup> Ensuring that only consultants book patients for surgery would also reduce the number of cancellation due to incorrect indication of surgery with significant impact on operating

time available. Sometimes, the total duration of surgery increases due to unanticipated surgical complications or technical problems.<sup>15,16</sup>

Study by Eijkemans et al showed that those who underestimated the time needed for operation by an average of 10 minutes had a cancellation rate of 11%, compared to 6% for those who overestimated the time needed.<sup>17</sup> Similarly study by Pandit et al concluded that overbooking a list was common also to avoid any perception that the surgical team was not hardworking.<sup>18</sup>

Delays in our patients also occurred from inadequacies in organizing laboratory tests and obtaining reports. Efforts should be made to improve patient communication and facilitate their compliance with scheduled procedures. Study by Da'ar OB et al. in Saudi Arabia showed that 84% of patients canceled same-day surgery once in 12 months, while 16% of them canceled more than once in the same period.<sup>19</sup>

Overlapping induction has been reported to decrease the non-operative time by 45.6%.<sup>20</sup> However this requires additional staff and equipments thus increasing the over-all cost. However, we can save OT time by inserting epidural catheters and peripheral and central intravenous access in the side room prior to shifting the patient to the OT while the previous patient is still in the OT.<sup>14,20</sup> It was observed that if the consultant surgeon and consultant anesthetist were present in the operation theatre, the list is likely to proceed with fewer delays.

We believe that around 60% of the on-the-day surgery cancellations of elective surgery were potentially avoidable. Pay for performance (P4P) diagnosis-related case mix model in which there are incentives to promote productivity and quality could be one of the measure to reduce cancellations.<sup>6</sup> This model was introduced by HongKong Hospital Authority in 2009-10 in which budget was attached to service growth in strategic priority areas that improve service quality and modernization and also provided incentives to promote productivity and quality.<sup>6</sup>

Thus the number of cancellations may be decreased by more thorough and timely clinical evaluation of patients; improved communication with patients about the proposed procedure; ensuring that all patients are discussed and seen by the consultants before booking; avoiding unrealistic overbooking reviewing and re-assessing all patients prior to surgery.

## CONCLUSIONS

Cancellation of elective surgical operations is a significant problem. Every cancellation should be considered a failure of the system and, consequently, an

incident report should be filed for each cancellation. As most causes of cancellation of operations are avoidable and steps must be taken to avoid these to enhance the utilization of operation theatre facility.

### COMPETING INTERESTS

None identified.

### REFERENCES

1. Kumar R, Gandhi R. Reasons for cancellation of operation on the day of intended surgery in a multidisciplinary 500 bedded hospital. *J Anaesthesiol Clin Pharmacol*. 2012;28(1):66-9. [\[PubMed\]](#)
2. Desta M, Manaye A, Tefera A, Worku A, Wale A, Mebrat A, et al. Incidence and causes of cancellations of elective operation on the intended day of surgery at a tertiary referral academic medical center in Ethiopia. *Patient Saf Surg*. 2018;12:25. doi:10.1186/s13037-018-0171-3. [\[PubMed\]](#)
3. Kaddoum R, Fadlallah R, Hitti E, El-Jardali F, El Eid G. Causes of cancellations on the day of surgery at a Tertiary Teaching Hospital. *BMC Health Serv Res*. 2016;16:259. doi: 10.1186/s12913-016-1475-6. [\[PubMed\]](#)
4. Chalya PL, Gilyoma JM, Mabula JB, Simbila S, Ngayomela IH, Chandika AB, et al. Incidence, causes and pattern of cancellation of elective surgical operations in a university teaching hospital in the Lake Zone, Tanzania. *Afr Health Sci*. 2011;11(3):438–43. [\[PubMed\]](#)
5. Morrissey S, Alun-Jones T, Leighton S. Why are operations cancelled? *BMJ*. 1989;299(6702):778. [\[FullText\]](#)
6. Chiu CH, Lee A, Chui PT. Cancellation of elective operations on the day of intended surgery in a Hong Kong based hospital: point, prevalence and reasons. *Hong Kong Med J*. 2012;18:5-10. [\[FullText\]](#)
7. Karnalkar A, Karnalkar P. Causes of cancellation for elective orthopedic procedures on the day of surgery. *Int J Sci Rep* 2015;1(5):235-8. [\[Link\]](#)
8. Sultan N, Rashid A, Abbas SM. Reasons for cancellation of elective cardiac surgery at Prince Sultan Cardiac Centre, Saudi Arabia. *J Saudi Heart Assoc*. 2012, 24(1): 29-34. [\[PubMed\]](#)
9. Hovlid E, Bukve O, Haug K, Aslaksen AB, von Plessen C. A new pathway for elective surgery to reduce cancellation rates. *BMC Health Serv Res*. 2012;12:154. [\[PubMed\]](#)
10. Kaddoum R, Fadlallah R, Hitti E, El-Jardali F, El Eid G. Causes of cancellations on the day of surgery at a Tertiary Teaching Hospital. *BMC Health Serv Res* 2016;16:259. [\[FullText\]](#)
11. Xue W, Yan Z, Barnett R, Fleisher L, Liu R. Dynamics of elective case cancellation for inpatient and outpatient in an academic center. *J Anesth Clin Res*. 2013;4(5):314. [\[PubMed\]](#)
12. Dhafar KO, Ulmalki MA, Felemban MA, Mahfouz ME, Baljoon MJ, Gazzaz ZJ. Cancellation of operations in Saudi Arabian hospitals: frequency, reasons and suggestions for improvements. *Pak J Med Sci*. 2015;31(5):1027–1032. [\[PubMed\]](#)
13. Dakum N K, Ramyil V M, Misauno MA, Ojo EO, Ogwuche E I, Sani A A. Reasons for cancellations of urologic day care surgery. *Nigerian Journal of Surgical Research*. 2006;8(1–2):30–33. [\[Link\]](#)
14. Garg R, Bhalotra AR, Bhadoria P, Gupta N, Anand R. Reasons for cancellation of cases on the day of surgery-a prospective study. *Indian J Anaesth*. 2009;53(1):35-9. [\[PubMed\]](#)
15. Huda F. A retrospective analysis of reasons for cancellations of elective surgery in a teaching hospital. *Int J Sci Stud*. 2014;2(2):28-30. [\[FullText\]](#)
16. Vinukondaiah K, Ananthkrishnan N, Ravishankar M. Audit of operation theatre utilization in general surgery. *National Medical Journal of India*. 2000;13:118–21. [\[FullText\]](#)
17. Eijkemans MJ, Van Houdenhoven M, Nguyen T, Boersma E, Steyerberg EW, Kazemier G. Predicting the unpredictable: a new prediction model for operating room times using individual characteristics and the surgeon's estimate. *Anesthesiology*. 2010;112:41-9. [\[Link\]](#)
18. Pandit JJ, Carey A. Estimating the duration of common elective operations: implications for operating list management. *Anesthesia*. 2006;61:768-76. [\[DOI\]](#)
19. Da'ar OB, Al-Mutairi T. How do patient demographics, time-related variables, reasons for cancellation, and clinical procedures affect frequency of same-day operating room surgery cancellation? A maximum likelihood method. *BMC Health Serv Res*. 2018;18(1):454. doi:10.1186/s12913-018-3247-y. [\[Springer\]](#)
20. Hanss R, Buttgerit B, Tonner PH, Bein B, Schleppers A, Steinfath M, et al. Overlapping induction of anesthesia: an analysis of benefits and costs. *Anesthesiology*. 2005;103:391–400. [\[FullText\]](#)