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On-the-Day of Surgery Cancellations of Elective Inpatient Surgeries in King Fahd Specialist Hospital in Dammam, Kingdom of Saudi Arabia

Azza A. El Mahalli, CAMS**, Arwa A. Al Thumairi,** HIMT, CAMS**,** and **Reem S. Al Omar,** HIMT, CAMS

Department of Health Information Management and Technology, College of Applied Medical Sciences, University of Dammam, Dammam, Saudi Arabia
aelmahalli90@gmail.com

Abstract. On-the-day of surgery, cancellations are used as indicators to measure the efficiency of operating room utilization. The study aimed to measure incidence of on-the-day of surgery cancellation of elective inpatient surgeries and to identify its reasons. A retrospective cohort study was conducted at King Fahd Specialist Hospital in Dammam, Kingdom of Saudi Arabia. Target population was cancelled elective inpatient operations on-the-day of surgery. Data were collected for the period from July 2007 till March 2008. Data were extracted from the statistics department where the number of scheduled elective surgeries and cancellations were available. Reasons of cancellations were extracted from the incident report and it was cross- checked with the cancellation forms of the operating theatre. Among 1789 scheduled elective surgeries, 196 (11.0%) were cancelled. Reasons of cancellations were hospital-related (57.7%); and patients' clinical (25.9%) and non-clinical (16.4%) causes. Avoidable reasons of cancellation were 74.1%. It was concluded that rate of cancellation was relatively high. Majority of cancellation reasons were hospital-related (administrative/ procedural) and patients' non- clinical reasons which were potentially avoidable. Accordingly, the hospital should improve communication channels at all levels and define a booking list to reduce rate of cancellation.

Keywords: On-the-Day of Surgery, Cancellations, Reasons.

Introduction

Cancelled elective operations on the intended day of surgery are used as an indicator to measure the efficiency of operating room utilization; sufficiency of operating room staff, equipment, and theatres; and efficacy

Correspondence & reprint request to: Dr. Azza A. El Mahalli
P.O. Box 2435, Dammam 31451, Saudi Arabia
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of booking[1]. Reported rates for day-of-surgery cancellation rates vary widely among institutions from < 10-20%[1-7].

Cancellation could be due to clinical and non-clinical reasons. Clinical reasons are directly related to the patient's medical condition. Non-clinical reasons are mostly administrative and have the possibility to be diminished. Non-clinical reasons include patient and hospital related reasons. Patient-related reasons refer to the permanent removal of the patient from the waiting or booking list at their own request; patient refusal for the surgery for fear of the operation or due to the change in his/her plans, or patient "no show"[8]. Hospital-related reasons are purely administrative such as shortage of post-operative or intensive care unit beds; lack of theatre time, necessary instruments or equipment, organ for transplant or prosthesis; inadequate preoperative preparation of the patient; booking list error[1]; and problems in the operation room (OR)[9]. Based on the causes, cancellations are divided by many authors into preventable and non-preventable[6-14]. Around 60% of cancellations are potentially preventable[1].

Cancellations also increase operational and financial cost[13,15,16], liability of hospitals[17] and dissatisfaction among patients[18].

Aim of the Study

To measure incidence of on-the-day of surgery cancellation of elective inpatient surgeries and identify its causes is the basic objective of this study.

Materials and Methods

Study Setting

This study was conducted at King Fahd Specialist Hospital (KFSH) in Dammam, Kingdom of Saudi Arabia (KSA). It is a tertiary referral hospital of 640 beds with 7 operating theatres. The study was conducted at all surgical departments namely: General Surgery, Urology, Orthopedics and Pediatrics.

Study Design

This was based on a retrospective cohort study.

Target Population and Sample Size

Medical records of inpatients with cancelled elective operations on the intended day of surgery in all surgical departments of the study hospital from July 2007 to March 2008. Cancelled elective surgeries on the intended day of surgery was defined as any non-emergent operation that was scheduled on the final theatre list on-the-day of surgery (generated at 14:30 to 15:00 on the previous day) or was subsequently added to the list, and was not performed on that day for any reason. The OR is working 5 days a week at the study hospital. The daily working hours for the operating theatre extend from 7:30 a.m. to 4:30 p.m. during week days.

Inclusion Criteria

1. Cancellations of inpatient elective surgeries.
2. Cancellations conducted on the intended day of surgery.
3. Cancellations for the period between from July 2007 to March 2008 due to availability of registration of cancellations at the operating theatre logs, and of reasons for cancellations at the incident reports available at the quality management and improvement department of the study hospital.

Exclusion Criteria

1. Cancellations due to patients' death.
2. Cancellations of emergency operations.

Based on hospital statistics, scheduled elective cases were 1789 during the study period; however, patients with cancellations for elective inpatient surgeries on the intended day of surgery represented 185.

Data Collection Methods

Data was collected from the statistics department where the number of scheduled elective surgeries and cancellations were available. Reasons of cancellations were extracted from the incident report available at the quality management and improvement department, and it was cross- checked with the cancellation forms of the OR.

Statistical Analysis

SPSS version 16 was used for data entry and analysis. Data was presented using percentages.

Ethical Consideration

Formal approval from the hospital administrator was obtained before conducting the research. Confidentiality of the data collected from medical records was considered.

Results

Tables 1 and 2 show that scheduled elective cases were 1789; however, patients with cancellations for elective inpatient surgeries on the intended day of surgery represented 185 (10.3%). Cancellation was mostly carried out once, while some patients had their surgeries cancelled twice, and a few had three cancellations. The number of cancellations adds up to 196 (11%). Average of cancellations was 1.1 cancellations per day as total OR working days during study period are 180.

Table1. Scheduled elective inpatient surgeries and cancelled elective operations on the intended day of surgery in KFSHD.

Month	Scheduled Elective Inpatient Surgeries		Canceled Elective Inpatient Operations on the Day of Surgery		% of Elective Inpatient Cancellations on the Day of Surgery/Month
	No	%	No	%	
July-07	234	13.1	39	20.0	16.7
August-07	216	12.1	20	10.2	9.3
September-07	177	9.9	35	17.9	19.8
October-07	123	6.9	9	4.6	7.3
November-07	181	10.1	20	10.2	11.0
December-07	170	9.5	20	10.2	11.8
January -08	260	14.5	19	9.6	7.3
February-08	243	13.6	20	10.2	8.2
March-08	185	10.3	14	196.0	7.6
Total	**1789**	**100.0**	**196**	**100.0**	**11.0**

Table 2. Patients with elective inpatient cancellations according to number of cancelled surgeries experienced in KFSHD.

	No of Cancellations	Percentage (%)
Patients with one cancellation	176	95.0
Patients with two cancellations	7	4.0
Patients with three cancellations	2	1.0
Total	**185**	**100.0**

Table 3 shows that hospital reasons (procedural / administrative) had the highest frequency (57.7%), followed by patients' clinical (25.9%) and non- clinical (16.4%) reasons.

Table 4 shows that avoidable reasons constituted 74.1%, while non-avoidable reasons had a rate of 25.9%.

Table 3. Reasons for on-the-day of surgery cancellations in KFSHD.

Reasons	No	%
Hospital reasons (procedural/ administrative):		
Improper preoperative evaluation of patients	29	14.4
Lack of resources*	27	13.4
Miscomunication†	22	10.9
No theatre time	20	10.0
Patient acquired nosocomial infection	18	9.0
Sub-total	116	57.7
Patients' clinical reasons:		
Abnormal lab results	34	17.0
Change of vital signs	18	8.9
Sub- total	52	25.9
Patient' non-clinical reasons:		
Patient refused surgery	31	15.4
Patient discharged against medical advice	2	0 .9
Sub-total	33	16.4
Total	201‡	100.0

**Lack of resources (postoperative / intensive care unit beds; necessary instruments/ equipment/ prothesis; or cross- matched blood for transfusion.*
†Miscommunication between hospital and patient/ hospital team/ other hospital departments.
‡Some patients experienced more than one reason.

Table 4. Avoidable and non-avoidable reasons of cancellation in KFSHD.

Reasons	No	%
Avoidable*	149	74.1
Non-avoidable	52	25.9
Total	201	100.0

**Hospital reasons (procedural/administrative) and patients' non-clinical reasons*

Discussion

The sole purpose of surgical intervention is to promote health and well-being. However, patients and their families may be negatively affected by various factors during this process. An important factor to consider is cancellation of planned surgical operations[8].

Study results revealed that the overall rate of cancellations during the study period was (11%) which is more or less similar to a study

conducted at an Australian referral hospital (11.9%)[1]. However, it is higher than that of a study conducted in King Khalid Teaching Hospital in Riyadh having a rate of 7.6%[11]. An efficient surgical service should have a low rate of cancellation of operations. If operations are cancelled, the operating theatres are under-used, efficiency is jeopardized, waiting list increases and cost rises[19].

The rate of cancellations during the study period showed differences among different months. This rate was remarkably high in September (19.8%), which is parallel to Ramadan, followed by July (16.7%) which is equivalent to start of summer vacation. The reasons of cancellations could be referred to preference of patients to spend Ramadan with their families. Similarly, patients may change their plans due to start of summer vacation. Referring to reasons of cancellation, results found that 16.4% was due to patients' non- clinical reasons including refusal to do surgery and discharge against medical advice. The cancellation rate based on decisions was made by the patients found to be 14.6% by Morrissey *et al.*[20], and 14% by Knight[12]. Evidence confirmed the importance of adequate psychological preparation before the operation. As cancellations have several consequences, when a patient decides to postpone or cancel his/her operation, this leads to sudden changes in the work schedule of the surgical team which, in turn, negatively affects other patients as well as the health care teams. To avoid inconveniences, patients must be thoroughly enlightened about the necessity of surgery and should be given the opportunity to ask questions, ensuring that their decisions on the matter are respected (informed consent)[8].

Hospital-related reasons represented 57.7% including improper preoperative evaluation of patients (14.4%). This could be a result of poor medical staff performance measures in the study hospital, where the surgeon blindly books an operation for his/her patient without conducting proper assessment or investigation procedures or both. Similarly, lack of resources such as postoperative/intensive care unit bed; surgeon; necessary instruments/equipment/prothesis; and cross-matched blood for transfusion represented high frequency 13.4%. Communication failure as a reason of cancellation has a rate of 10.9%. This happens when some patients have been sent home and not reminded of their date of surgery. Communication failure between OR theatres and registration office to check availability of post- operative/ intensive care unit beds or miscommunication with the surgeon reminding him with date of surgery.

Moreover, no theatre time represented (10%). This includes booking problems, underestimation of the time needed for each surgical procedure and previous operating list running late. "No theatre time" as a reason of cancellation was documented in a study conducted in UK and constituted (20%)[21]. Cancellations stemming from over-listing usually affect patients who are at the end of the operating list. Whereas, many factors including the surgical team members; the knowledge, skill and speed of the surgeon; workload; adequacy of available equipment; and sterilization schedule should all be considered when defining the work program and list of the operation unit. Otherwise, cancellations will become inevitable, especially for the patients located at the end of the list[8].

To clarify the reasons of cancellations in terms of being potentially avoidable and helping in the improvement process, hospital reasons (administrative/procedural), and patients' non-clinical reasons were considered avoidable and represented 74.1%. It is greater than that recorded in other studies[13]. Fixing these problems is substantial to reduce rate of cancellation. Accordingly, this study will recommend solutions to solve these hospital related procedural and administrative problems. Moreover, further researches should follow implementation of these solutions and its effect on the rate of cancellation in the future.

Results of the present study demonstrate those patients' clinical reasons of cancellation including abnormal lab results and change in vital signs (25.9%). Evidence confirmed that patients' clinical change was responsible for 17.1%[1] to 49%[12] of total cancellations. These reasons considered to be non-avoidable[1,12].

Conclusion and Recommendations

Rate of cancellation of elective surgeries on the intended day of surgery at the study hospital was relatively high. Majority of cancellation reasons were hospital-related (administrative/procedural); followed by patients' non-clinical reasons. Most of these reasons are potentially avoidable. Among them are: Patient's refusal of surgery; improper preoperative evaluation of patients; lack of hospital resources; miscommunication; and lack of theatre time. Consequently, the following is recommended;

1. Proper assurance of the patients before surgery and improving informed consent.

2. Improving medical staff performance and enhancing preoperative judgment of the patients before booking.

3. Improving availability of hospital resources as necessary instruments, equipment, prosthesis, and cross- matched blood for transfusion.

4. Improving communication channels at all hospital levels including OR and registration office to ensure availability of post-operative beds; OR and ICU to ensure availability of beds. As well as improving communication with surgeons, and reminding patients about time of the operation. This may be conducted through SMS, or e- mails.

5. Improving defining booking list through proper estimation of time of each surgical procedure putting into consideration many factors such as the surgical team members; knowledge, skill and speed of the surgeon; nursing staff attending operation; and anesthetists. Overbooking could also be prevented through conducting most predictable operations first.

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إلغاء العمليات الجراحية غير العاجلة فى يوم إجراء الجراحة بمستشفى الملك فهد التخصصى بالدمام، المملكة العربية السعودية

عزة على المحلى، وأروى عبدالرحمن التميري، وريم سعيد آل عمر

قسم إدارة وتقنية المعلومات الصحية،
كلية العلوم الطبية التطبيقية، جامعة الدمام
الدمام – المملكة العربية السعودية

المستخلص يستخدم إلغاء العمليات الجراحية غير العاجلة فى اليوم المخصص لإجراء الجراحة كمؤشرلقياس كفاءة إستخدام غرفة العمليات. وتهدف هذه الدراسة إلى قياس معدل إلغاء العمليات الجراحية غير العاجلة فى اليوم المخصص لإجراء الجراحة وتحديد أسباب ذلك. وقد أجريت دراسة الأتراب بأثر رجعي في مستشفى الملك فهد التخصصى بالدمام بالمملكة العربية السعودية. وكانت الفئة المستهدفة هى العمليات الجراحية غير العاجلة التى تم إلغاؤها فى اليوم المخصص للجراحة.وقد تم جمع البيانات خلال الفترة من يوليو٢٠٠٧حتى مارس٢٠٠٨. وقد تم استخراج البيانات من قسم الإحصاء حيث كان عدد العمليات المجدولة والملغاة متاحا. وتم استخراج أسباب الإلغاء من تقرير الحادث، وكان يتم التدقيق من خلال نماذج الإلغاء بغرفة العمليات. ووجد أنه من بين١٧٨٩ عملية جراحية غير عاجلة فإنه قد تم إلغاء ١٩٦ عملية جراحية بنسبة (١١,٠٪). وكانت أسباب الإلغاء هى أسباب ذات صلة بالمستشفى (٥٧,٧٪) ، وأسباب إكلينيكية (٢٥,٩٪) ، وأسباب غير إكلينيكية (١٦,٤٪) خاصة بالمرضى. ومثلت الأسباب التى يمكن تجنبها نسبة

٧٤,١٪ . يعتبر معدل إلغاء العمليات الجراحية غير العاجلة مرتفعاً نسبيا. وكانت معظم أسباب الإلغاء ذات صلة بالمستشفى (سواء إدارية أو إجراءات)، يليها أسباب غير إكلينيكية خاصة بالمرضى، وهى أسباب يمكن تجنبها. وبالتالي ينبغى على المستشفى تحسين قنوات الاتصال على كل المستويات وتحديد قائمة الحجز للحد من نسبة الإلغاء.