

# 1 Cancellation of Elective General Surgical Operations at the Day 2 of Intended Surgery

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## 7 **Abstract**

8 Background: Cancellation of surgical operations in hospitals is a significant problem with  
9 many undesirable consequences. Cancelled operations can annoy patients and their families.  
10 They are a major drain on health resources, increases theatre costs, results in wasted  
11 operating room time and decreases efficiency. In spite of the extensive available literature on  
12 preparation of surgical patients and performance of surgical procedures, the focus given to the  
13 cancellation of planned surgical operations has been quiet restricted globally. Objectives: To  
14 determine the magnitude and point prevalence of surgery cancellation in patients scheduled  
15 for elective operation and it's different reasons. Patients and methods: A prospective cross  
16 sectional study carried out in Omdurman teaching hospital for all patients scheduled for  
17 elective general surgical operations in one year (2012 August -2013 August).

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19 **Index terms**— Cancellation; Elective Operation; Postponement.

## 20 **1 Cancellation of Elective General Surgical Operations at the 21 Day of Intended Surgery**

22 Ahmed A Elrahman ? , Aamir A Hamza ? & Mohayad A El-Haj ? Abstract-Background: Cancellation of surgical  
23 operations in hospitals is a significant problem with many undesirable consequences. Cancelled operations can  
24 annoy patients and their families. They are a major drain on health resources, increases theatre costs, results in  
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28 Objectives: To determine the magnitude and point prevalence of surgery cancellation in patients scheduled  
29 for elective operation and it's different reasons. Patients and methods: A prospective cross sectional study carried  
30 out in Omdurman teaching hospital for all patients scheduled for elective general surgical operations in one year  
31 (2012 August -2013 August).

32 Results: During the study 2750 patients were scheduled for general surgical operations, 2460 (89.5%) patients  
33 were operated on their planned date. A total of 290 (10.6%) operations were cancelled. Mean age was  $41.2 \pm$   
34 16.5 years with female to male ratio 1.2:1. There were many reasons for postponement of surgery; the main  
35 reasons were categorized into medical related, patient related, administrative, inadequate preparations of patients  
36 and other reasons accounted for 30%, 25.5%, 21%, 19.7% and 3.8% respectively. The major three causes for  
37 cancellation in the study were; failure of the patients to attend uncontrolled high blood pressure and overloaded  
38 schedule, these were seen in 57 (19.7%), 35 (12.1%) and 32 (11.0%) respectively. Most of the reasons 76.9% were  
39 potentially avoidable. Conclusion: It was obvious that most of the reasons of postponement of elective general  
40 surgical operations were avoidable and can be prevented by simple steps. Cancellations can be minimized if the  
41 patients with medical problems were detected early and referred for an anaesthetic assessment soon after they  
42 are scheduled for surgery.

43 **2 I. Introduction of the surgeries in Omdurman Teaching**

44 Hospital are being performed at a low cost. This means a huge number of patients most of whom belong to lower  
45 socio-economic class and travelling from far areas, arriving to be operated.

46 Elective surgery is an important part of a hospital's workload. Unanticipated postponement on the day of  
47 surgery is a tremendous emotional as well as econo-mical trauma for such patients in addition to causing an  
48 increase in operation theatre costs and decrease in its efficiency (1) .

49 Cancellation of surgical operations in hospitals is a significant problem with many undesirable consequences.  
50 Cancelled operations can annoy patie-nnts and their families. They are a major drain on health resources, increases  
51 theatre costs, results in wasted operating room time and decreases efficiency. However, the performance of a  
52 surgical operation on schedule requires a complex process of logistics. In spite of the extensive available literature  
53 on preparation of surgical patients and performance of surgical procedures, the focus given to the cancellation  
54 of planned surgical operations has been quiet restricted globally (2) .Elective surgery is an important part of  
55 a hospital's workload. Whenever a case is put on list, it involves interaction of a number of people and in the  
56 same way its postponement affects many parties (3) .Different definitions of cancellation exist in the international  
57 literature (4) . Some authors define 'cancellation' as only those procedures that were cancelled on the day on  
58 which surgery was scheduled, whereas others also include those that were cancelled on the previous day (5,6) .

59 **3 II. Patients and Methods**

60 This is a prospective, cross sectional, descriptive, hospital-based study that was conducted at Omdurman Teaching  
61 Hospital over one year (2012 Aug to 2013 Aug). All patients scheduled for different elective general surgical  
62 procedures during the time of study were enrolled. Non-probability sampling, with total coverage during the  
63 study period was adopted. Included were patients scheduled for elective general surgery after accepting the  
64 given informed consent. All patients scheduled for emergency surgery or subspecialty surgical procedures were  
65 excluded. Predesigned questionnaire was used for data collection. Variables included patient's characteristics,  
66 type of operation, medical related reasons, inadequate preparation of patient, administrative related reasons,  
67 patients related reasons and others. The collected data was processed, and analyzed statistically using SPSS  
68 computer package version 20.0. Percentages were calculated & Chi-square test was used to analyze the M  
69 difference between the various groups. Statistical significance was accepted for  $P < 0.05$ . Preoperative consent  
70 was obtained from patients together with hospitals approval ethical clearance.

71 **4 III. Results**

72 **5 a) Patients' demographics**

73 A total number of 2750 patients were scheduled for general surgical operations; most of them 2460 (89.5%) were  
74 operated upon on planned date. A considerable number 290(10.6%) of operations were cancelled. Four operation  
75 lists were lost completely due to vacation.

76 Females were predominant 161(55.5%), with female: male ratio of 1.2:1.The mean age was  $41.2 \pm 16$  years and  
77 (range2 -80 years). Most of the patients 180 (62.0%) were in the age group 21-50 years (Table 1). Total 290 100

78 **6 b) Categories of cancellation**

79 There were many reasons for postponement of surgery and were categorized into medical related, patient  
80 related, administrative, inadequate preparations of patients and other reasons. Medical and patients related  
81 reasons were the commonest and accounted for 30%, 25.5% respectively (Figure 1). The most common medical  
82 related reasons for cancellation were; high blood pressure (39.8%), change of treatment plan (22.7%) and  
83 haemoglobin less than ten gram/dl (12.3%) of cancellations within this category. Other causes with lesser  
84 percentage included; uncontrolled Diabetes Mellitus, upper respiratory tract infection, ischemic heart disease  
85 (Table 2). e) Administrative related reasons

86 The most common administrative reason for cancellation was shortage of time to cover the whole list  
87 of operations, which accounted for 11% of all cancellations and more than half the reasons within this  
88 category.Failure of equipment needed to conduction the specific operation or no water supply accounted for  
89 13.6% each (Table 2).

90 **7 f) Inadequate patient preparation reasons**

91 Blood not arranged or unavailable in 57.1% and some investigations not done 42.5% were the major contributing  
92 factors for surgery cancellation in this group. However drugs not arranged, poor gut preparation for colonic  
93 surgery or uncontrolled thyroid patients were the reasons for few elimination (Table 2).

94 **8 g) Other reasons for cancellation**

95 Admission errors or absent consultant surgeons constituted one percent each from the total cancelations (Table  
96 2)

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## 97 9 IV. Discussion

98 Surgical cancellation is scheduled surgery which is not done at intended date. An efficient surgical service should  
99 have a low rate of cancellation. If operations are cancelled, the Operation Theatres (OT) are underused, efficiency  
100 is jeopardized, waiting list increases and cost rises (7) . The National Audit Office in Britain examined five district  
101 health authorities in detail and concluded that Operation Theatres were being used half their capacity in spite  
102 of huge waiting lists (8) . Most operations are cancelled at 24-hour notice (9) . The patients and the relatives feel  
103 disappointed, frustrated, and anxious (10) .

## 104 10 a) Cancellation rate

105 In this study the cancellation rate(CR) of elective general surgical operations was 10.6 % which is similar to  
106 a previous report from a developing country (11). However, cancellation rates ranging between 19% and 33%  
107 were reported from other developing countries (12, 13), compared to rates between 11% and 24% from developed  
108 countries (14,15).The cancellation rate found in this study was compared to cancellation rates reported by different  
109 authors (Table 3). Hand R, et al. (14) 1990 USA 17.0% Magbool G, et al. (11) 1993 Saudi Arabia 09.1% Lacqua  
110 MJ, Evans JT (23) 1994 USA 17.0% Cavalcante JB (12) 2000 S. America 33.0% Aguirre-Cordova JF (15) 2003  
111 Mexico 24.0% Fersch MB, et al. (24) 2005 USA 13.0% Schofield WN, et al. (25) 2005 Australia 11.9% Paschoal  
112 ML, Gatto MA (13) 2006 Brazil 19.9% Sanjay P, et al. (26) 2007 UK 14.0% ZafarA,et al. (27) 2007 Pakistan  
113 25.0% Doumi EA, et al. (1) 2008 Sudan 09.9% current study \* 2013 Sudan 10.6%

114 In the present study, the most common types of cancelled operations were thyroid, breast, hernias and anorectal  
115 conditions. For a multi-dimensional problem such as surgical cancellations, it is important to address major reasons  
116 that result in cancellations.

## 117 11 b) Medical related reasons

118 Among medical related reasons (MRR) uncontrolled high blood pressure (HBP) is commonest reason accounted  
119 for 35 (12.1%) cancellation. Hypertension is certainly associated with an increased risk of perioperative morbidity  
120 and mortality and a diastolic blood pressure of 110-115 mmHg was considered as a cutoff for postponing  
121 anaesthesia (16) . Doumi EA, et al. in El Obied Teaching Hospital in Western Sudan also found that HBP  
122 is commonest MRR accounted for 22.2% (1) , as well as reported in similar study in London (17) .

123 Majority of elective patients were seen by the anaesthetist only on the day prior to surgery. So the preoperative  
124 optimization is done over a short period of time. Studies have shown that preoperative anaesthesia assessment  
125 of patients in anaesthetic assessment clinics significantly reduces operative room delays and cancellations (18) .

126 The uncertainty of the highest safe blood pressure for anaesthesia results in variations in practice (19) .

127 The second reason in MRR is change treatment plan due to recent change in clinical status which account for  
128 6.9 % in our study and showed to be 7.4% in Doumi EA, et al. study (1) . c) Patient related reasons Failure  
129 of patient to attend is the commonest cause in this category and accounted for 57 (19.7 %). This could be  
130 attributed to fear of operation due to inadequate psychological preparation. A similar significant number found  
131 in study done in Nigeria by A.S Oguntol, et al. (19) (20).

## 132 12 d) Administrative related reasons

133 Considering administrative related reasons (ARR), shortage of time accounted for 32 (11%) of the operation  
134 cancelled. This found to be greater than 5.6% in Western Sudan (1) and 1.2% in Nigeria (19) studies and less  
135 than that of William, et al. study 18.7% (20) . Lack of anaesthesia staff, power break down and no water supply  
136 were the other ARR. When analyzed these reasons were due to failure of the hospital administration to recognize  
137 the needs of the operative theatre and the indifferent attitudes among the theatre staff.

138 A lot of precious time was lost in-patient transport in or out of the operative theaters (OT), in induction of  
139 anesthesia, in surgical preparation and draping. The room turn over time may be also reduced if more recovery  
140 room beds were made available (21) . In a recent study it was found that only 7% the surgical procedures were  
141 started on time (22) .

142 Training and delegation of responsibilities to young motivated qualified nurses as 'Sister-in-charge' to take  
143 over the administrative responsibility of the operating theater might help to overcome the problem. The most  
144 common inadequate patient preparation reasons (IPPR) was some investigations not done which accounted for  
145 6.9% of all cancellations. This reflects the reluctance of surgical staff and lack of collaboration with anaesthetic  
146 staff. Although this is low compare with 7.1%-27.2% in other different studies (1,19) . Incomplete investigations  
147 also could be secondary to lack of funds to pay for the tests rather than inefficiency of the laboratories, though  
148 occasionally lack of reagents, poor electricity supply are common causes in the developing countries.

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150 Blood not arranged is a second common reason in IPPR, accounted for 5.2% which is greater than 0.4% (1) and  
151 less than 11.2% (19) .

152 Phobia for blood donation by patient relatives and the public at large, prevent adequate stocking of our blood  
153 banks, thus blood not easily made available for surgical procedures. There is a need to reawaken the usual mass

154 donation by groups of students, civil servants, societies and associations. Auditing of blood usage during surgical  
155 procedures should be carried out in various centers in order to really determine what should be the minimum  
156 number of units to be requested for procedures.

157 Lack of surgeons and admission errors, accounted for one percent each, this was another reason for cancellations.  
158 It is rather higher than 0.6% for absence surgeon and 1.2% for admission error in other study (1) . This  
159 occurred in units where team leaders were either part time employees, involved in hospital administration or  
160 reporting late due to long distance travels. Adequate staffing of surgical teams and theater workers including  
161 porters shall reduce the time wastage thus enhancing efficiency.

162 Unplanned admissions and lengthy OT lists prepared by junior surgeons, who were not familiar with the  
163 procedures, was also a reason for operation cancellation. Many patients did not need surgery or required further  
164 work up before surgery. Ensuring that only consultants book patients for surgery would reduce the number of  
165 cancellation due to incorrect indication of surgery with significant impact on operating time available. Influence of  
166 surgeon experience was observed in this study and found inexperienced surgeons add significantly to the operation  
167 time. Consultants were quicker and their presence reduced the likelihood of complications, thus reduced operative  
168 time. Moreover it was observed that if a consultant surgeon and consultant anaesthetist were present in OT,  
169 the list is likely to proceed with fewer delays (19) . In our study most of surgeries were cancelled at the intended  
170 date 53.8% which reflect the importance of preoperative rounds. f) Avoidable causes of cancellation Schofield, et  
171 al.2005 classified the causes of cancellation of operations as avoidable and non-avoidable (11) . In our study non  
172 avoidable causes were recent clinical changes in the patient's condition, patient who didn't show up, inability to  
173 pay fees, cancellation by the patient and cancellation due to emergency priority accounted for 23.1%. Accordingly  
174 the majority of our cancellations 76.9% were potentially avoidable.

175 At another study performed at ambulatory surgery practice in the United Kingdom, reasons for cancellation  
176 were: acute medical conditions in 23.3% of cases, personal decision of the patient to refuse programming in  
177 22.2%, non-attendance in 2.1%, failure to follow pre-operative guidance in 23.3% and unavailability of resources  
178 in 29%. These causes were preventable or possibly preventable in 57.1% of cases, difficult to prevent in 29% and  
179 not preventable in 13.9% (6) .

## 180 14 V. Conclusion

181 It was obvious that most of the reasons of postponement general surgical operation were avoidable and can be  
182 prevented by simple steps. Cancellations can be minimized if the patients with medical problems were detected  
183 early and referred for an anaesthetic assessment soon after they are scheduled for surgery.

184 In order to enhance cost -effectiveness and efficiency; efforts should be made to prevent unnecessary post-  
185 ponement through careful planning aimed at increasing operation theatre spaces and efficient utilization of few  
186 available hospital resources including that of the operating room, theatre facilities and valuable man power  
187 improving the scheduling and admission procedure is required for better use of hospital resources.

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Figure 1: Figure 1 :

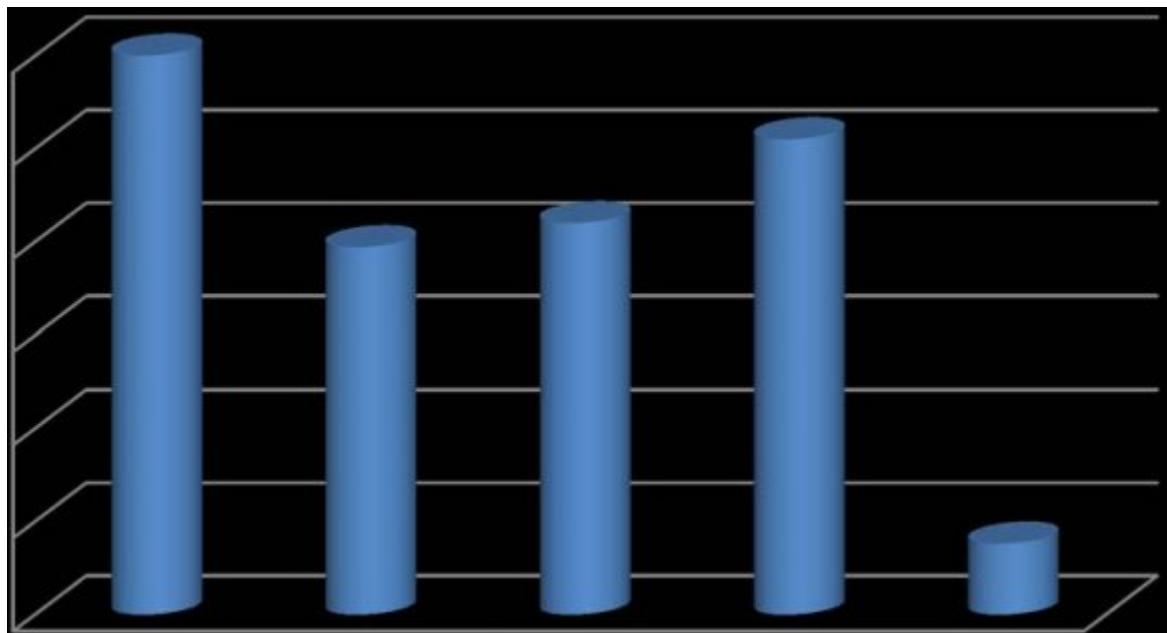


Figure 2:

1

Age (years)	Frequency	Percent
2-10	7	2.4
11-20	26	9.0
21-30	60	20.7
31-40	59	20.3
41-50	61	21.0
51-60	36	12.4
61-70	34	11.7
71-80	7	2.4

Figure 3: Table 1 :

		Frequency Percent		
		Within tal	To- tal	Within Category
Medical reasons				
High Blood pressure	35	12.1%		39.8%
Diabetes mellitus	07	2.4%		07.9%
Upper Respiratory tract infection	03	1.0%		03.4%
Anaemia	11	3.8%		12.5%
Ischemic heart disease	03	1.0%		03.4%
Unfit for medical condition	04	1.4%		04.5%
Change of treatment plan	20	6.9%		22.7%
Abnormal laboratory results	04	1.4%		04.5%
Patient taking aspirin	01	0.3%		01.1%
Total	88	30.3%		100%
Patient related reasons				
Patient failed to attend	57	19.7%		77.5%
Patient refusal	6	2.1%		08.1%
Financial problems	9	3.1%		12.2%
Total	74	24.9%		100%
Administrative related reasons				
Overload schedule	32	11.0%		54.3%
Lack of Anesthetists	10	3.4%		16.9%
Equipment failure	8	2.8%		13.6%
Power breakdown	1	0.3%		01.7%
No water supply	8	2.8%		13.6%
Total	59	20.3%		100%
Inadequate patient preparation reasons				
Medicine not arranged	1	0.3%		02.1%
Poor gut preparation	5	1.7%		10.6%
Patient not euthyroid	3	1.0%		06.4%
Anesthesia work-up need	1	0.3%		02.1%
Some investigation not done	20	6.9%		42.6%
Blood not available	12	4.1%		25.2%
Blood not arranged	15	5.2%		31.9%
Total	47	17.5%		100%
Other reasons for cancellation				
Failure of administer anesthesia	2	0.7%		15.4%
Referral to other consultant	2	0.7%		15.4%
Operation not required	1	0.3%		7.70%
Failed intubation	1	0.3%		7.70%
Admissions error	3	1.0%		23.0%
Operated elsewhere	1	0.3%		7.70%
Others	1	0.3%		7.70%
Lack of staff of surgeons	3	1.0%		23.0%
Total	13	4.6%		100%

Figure 4: Table 2 :

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**3**

Author	Year	Country	Cancellation rate
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Figure 5: Table 3 :



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