

# CAN PREOPERATIVE ANESTHESIA CONSULTATION CLINIC HELP TO REDUCE OPERATING ROOM CANCELLATION RATE OF CARDIAC SURGERY ON THE DAY OF SURGERY?

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## Abstract

**Background:** Many surgical procedures are delayed or cancelled due to inadequate preoperative assessment and preparation. Case cancellations can be decreased by improved preoperative patient evaluation, improved communication between physician and patient, and modified schedule design. Because of importance of the high cost associated with operating room cancellations; healthcare providers have exerted efforts to decrease case cancellations on the day of surgery. The aim of this study was to evaluate the role of “pre-anesthesia consultation clinic” in reducing operating room cancellation.

**Methods:** We prospectively studied cancellation rate in 1716 scheduled cases for open heart surgery during a 4 months period in a teaching hospital. Of the 1716 patients, 866 cases were scheduled for operation *before* establishment of pre-anesthesia consultation clinic (Group 1) and 850 cases were scheduled *after* establishment of those clinics (Group 2). The data collected included patient age, ASA physical status and date of the preoperative assessment.

**Results:** Of the 1716 patients studied, 15.03% of cases were cancelled in the two groups. Cancellation rate in Group 1 was 146 (16.8%) and cancellation rate in Group 2 was 113 (13.29%). This difference was statistically significant ( $p = 0.046$ ). The most common cause of cancellation in the two groups was incomplete medical work-up (32%) [group 1 (19.8%) more than group 2 (12.6%)].

**Conclusion:** Since the most common cause of cancellation in the two groups was incomplete medical work-up, then visitation of patients to the pre-anesthesia consultation clinic would minimize cancellation rate on the day of surgery.

**Keywords:** pre-anesthesia evaluation, cancellation rate, consultation clinic, cardiac surgery.

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## Introduction

One of the ultimate goals of preoperative medical assessment of patients is to increase the quality and decrease the cost of perioperative care<sup>1</sup>. Timing of the pre-anesthesia assessment may influence the cancellation rate on the day of surgery. These cancellations may lead to patients dissatisfactions, increase costs and prolong stay of patients in hospital<sup>1</sup>.

There are investigations that confirm positive effects of pre-anesthesia consultation clinic on the cancellation rate of surgery<sup>1,2,3</sup>. Among these studies Conway in 1992<sup>4</sup> and Badner in 1998<sup>5</sup> reported that with ideal functioning of the pre-anesthesia consultation clinic, delay and cancellations could potentially be reduced. Lacqua in 1994<sup>6</sup> reported that case cancellations can be decreased by improved preoperative patient evaluation, improved communication between physician and patient and modified schedule design. Fisher in 1996 showed that almost 90% of operating room cancellation is day of surgery cancellations. These cancellations increase turn over time of operating room and so increase costs. Against these result John B. Pollard in 1999<sup>7</sup> reported that operating room cancellation rate of patients are evaluated within 24h of surgery is similar those patients are seen 2-30 days before surgery.

Because of controversies about influence of timing of the pre-anesthesia assessment on the cancellation rate on the day of surgery, we decided to compare the effect of establishment of "pre-anesthesia consultation clinic" on cancellation rate in cardiac surgery.

## Methods and Materials

We prospectively reviewed cancellation rate of 1716 scheduled patients for open heart surgery during a 4 months period in Shahid Rajaii Heart Center (Tehran-Iran) between May 1, 2007 and August 31, 2007. Of 1716 patients, 866 cases were scheduled for open heart surgery in May & June *before* the establishment of pre-anesthesia consultation clinic (Group 1 or pre-clinic group), and 850 cases were scheduled in July & August *after* establishment of pre-anesthesia consultation clinic (Group 2 or post-clinic group). All patients in Group 1 were visited on the day before surgery, and in

Group 2, we asked surgeons and cardiologists to refer patients to the pre-anesthesia consultation clinic.

All patients were referred to us with their medical record including: history and physical examination, primary essential laboratory tests, chest X-ray and signed operation consent form. Patients were evaluated by cardiac anesthesiologists and their assistants. The data for patients included age, sex, ASA physical status, date of preoperative assessment, scheduled date of surgery, and the actual date of surgery, were entered in the hospital database. Additional laboratory tests or consultations were obtained as needed. A patient was classified as cancelled case, if the patient's name was on the published operating room schedule but did not have surgery performed on the day scheduled.

Results were analyzed with SPSSv. 12.0 statistical software (SPSS Inc. Chicago, IL). Statistical analysis between categorical variables was done by using Chi-square test, and comparing continuous variables between the two study groups was done by using "independent samples t-test". The statistically significance level considered  $p \leq 0.05$ .

## Results

1716 patients scheduled for open heart surgery were divided into two groups who were similar in gender, age, operation type and ASA physical status (Table 1).

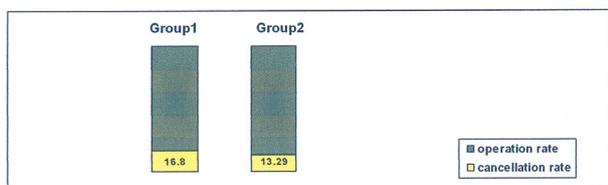
Table 1  
Patients' background characteristics

	Group 1 N = 866	Group 2 N = 850	p value
Gender (Male/Female)	523/343	519/331	0.86
Age (year)	59 ± 19	61 ± 17	0.63
ASA class III-IV	303 (34.9%)	323 (37.9%)	0.79
Operation type (CABG/Valve)	589/277	609/241	0.44
<b>Timing of preoperative evaluation (1 day/3-10 days before Op.)</b>	866/0	527/323	0.001

ASA = American Society of Anesthesiologists physical status.  
CABG = Coronary bypass grafting surgery.  
Op. – Operation.

All of 866 patients in Group 1 (100%) and 527/850 (61.9%) of patients in Group 2 received their preoperative evaluation within 24h of surgery. Only 323/850 (38.1%) of patients in Group 2 were referred to the pre-anesthesia consultation clinic after admission by the surgeon (3-10 days before surgery). The frequency of cancellations in all of patients (before and after establishment of consultation clinic) was 259/1716 (15.1%): 146/866 (16.8%) of cases in Group 1 and 113/850 (13.29%) of cases in Group 2 (Fig. 1). There was statistically significant difference (P = 0.046) between the two groups.

Fig. 1  
Cancellation rate (percentage) in the two study groups



The most important causes of cancellations in all patients included: incomplete medical work-up (32%, 83/259), acute patient illness (23%, 60/259), ICU problem in patient admission (18%, 47/259), surgeon’s decision (12%, 31/259), patient’s decision (7%, 18/259), insufficient operating room time (4%, 10/259) and other causes (4%, 10/259). Comparison of the two groups for causes of cancellation showed that the most important cause of cancellation in the two groups was incomplete medical work-up (Table 2).

Table 2  
Causes of operation cancellation *before* (Group 1) and *after* (Group 2) establishment of pre-anesthesia consultation clinic

Cancelled cases	Group 1 n = 146	Group 2 n = 113	P value
Incomplete medical work-up	51 (35%)	32 (28%)	0.03
Acute patient illness	31 (21%)	29 (26%)	0.10
Insufficient OR time	6 (4%)	4 (3.5%)	0.76
Surgeon’s decision	18 (12%)	13 (11.5%)	0.83
Patient’s decision	11 (8%)	7 (6%)	0.49
ICU admission problem	25 (17%)	22 (19%)	0.39
Other causes	4 (3%)	6 (5%)	0.66

## Discussion

Cancellation of an elective operation results in waste of operating room time and additional hospital expense<sup>8,9</sup>. The most important causes of these cancellations are: insufficient OR time, surgeon’s discretion (included urgent or emergent surgery preempting elective surgery of illness of surgeon), incomplete medical work-up, acute patient illness, patient decision and ICU problems<sup>9</sup>.

Some of these causes are preventable e.g. incomplete medical work-up is a preventable cause. If patients are completely evaluated preoperatively, cancellation rate of operating room on the day of surgery is reduced. For this reason, timing of the pre-anesthesia assessment may reduce cancellation rate on the day of surgery<sup>10,11</sup>.

Other benefits of early preoperative assessment consent of: lower anxiety levels, lower analgesic requirements, greater satisfaction with surgical experience, decreased frequency of problems on postoperative follow-up<sup>12-14</sup>. It has been demonstrated that the knowledge gained by patients taught four to eight days before surgery was greater than those who were taught the day before surgery<sup>4</sup>.

At our Hospital, it was assumed that incomplete medical work-up was a preventable major cause of cancellations. In this study we found that patients who visited within 24 hours of surgery have higher (35%) cancellation rate in Group 1 than those visited 3-10 days before surgery (28% in group 2) (Table 2).

In total, establishment of pre-anesthesia consultation clinic has effective role in total rate of surgery cancellation in our study (Fig. 1). The reason in that timing of the pre-anesthesia assessment would allow enough time for further testing and further medical evaluation of patients when necessary. This may be true in some settings, such as in our Hospital. In some other centers administrative problems have been found to be the single most important source of cancellation. A review of operating room cancellations at a community hospital revealed that 43% of their cancellations were a result of administrative reasons<sup>15</sup>. Similar results were reported in an academic setting, in which 45% of operating room cancellations were

attributed to a single administrative reason (shortage of OR time)<sup>16</sup>. For hospitals like ours, with high rate

of medical cancellations, early visiting the patients in pre-anesthesia consultation clinic is important.

## References

1. FISCHER SP: Development and effectiveness of an anesthesia preoperative evaluation clinic in a teaching hospital. *Anesthesiology*; 1996, 85:196-206.
2. POLLARD JB, ZBORAY AL, MAZZE RI: Economic benefits attributed to opening a preoperative evaluation clinic for outpatients. *Anesth Analg*, 1996, 83:407-10.
3. ASIMAKOPOULOS G, HARRISON R, MAGNUSSEN PA: Preadmission clinic in an orthopedic department: evaluation over a 6-month period. *JR Coll Surg Edinb*; 1998, 43:178-81.
4. CONWAY JB, GOLDBERG J, CHUNG F: Preadmission anesthesia consultation clinic. *Can J Anaesth*; 1992 Dec, 39(10):1051-7.
5. BADNER NH, CRAEN RA, PAUL TL, DOYLE JA: Anaesthesia preadmission assessment: an new approach through use of a screening questionnaire. *Can J Anaesth*; 1998 Jan, 45(1):87-92.
6. LACQUA MJ, EVANS JT: Cancelled elective surgery: an evaluation. *Am Surg*; 1994 Nov, 60(11):809-11.
7. POLLARD JB, OSON L: Early outpatient preoperative anesthesia assessment: does it help to reduce operating room cancellations? *Anesth Analg*; 1999 Aug, 89(2):502-5.
8. BOOTHE P, FINEGAN BA: Changing the admission process for elective surgery: an economic analysis. *Can J Anaesth*; 1995, 42:391-4.
9. RAI MR, PANDIT JJ: Day of surgery cancellations after nurse-led pre-assessment in an elective surgical centre: the first 2-years. *Anesthesia*; 2003 Jul, 58(7):692-9.
10. STARSNIC MA, GUARNIERI DM, NORRIS MC: Efficacy and financial benefit of an anesthesiologist-directed university preadmission evaluation center. *J Clin Anesth*; 1997, 9:299-305.
11. SHEARER W, MONAGLE J, MICHAELS M: A mode of community based, preadmission management for elective surgical patients. *Can J Anaesth*; 1997, 44:1311-4.
12. ARELLANO R, CRUISE C, CHUNG F: Timing of the anesthetist's preoperative outpatient interview. *Anesth Analg*; 1989, 68:645-8.
13. KLOPFENSTEIN CE, FORSTER A, VAN GESSEL E: Anesthetic assessment in an outpatient consultation clinic reduces preoperative anxiety. *Can J Anaesth*; 2000 Jun, 47(6):511-5.
14. TWERSKY RS, LEBOVITS A, LEWIS M, FRANK D: Early anesthesia evaluation of the ambulatory surgical patient: Does it really help? *Clin Anesth*; 1992, 4:204-7.
15. HAND R, LEVIN P, STANZIOLA A: The causes of cancelled elective surgery. *Qual Assur Util Rev*; 1990, 5:2-6.
16. LINGSTON JI, HARVEY M, KICHIN N: Role of pre-admission clinics in a general surgical unit: a 6-month audit. *Ann R Coll Surg Engl*; 1993, 75:211-2.