

Changes in the Operating Program: Incidence, Causes and Consequences

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DOI: [10.36348/sjm.2022.v07i08.005](https://doi.org/10.36348/sjm.2022.v07i08.005)

| Received: 05.07.2022 | Accepted: 13.08.2022 | Published: 17.08.2022

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Abstract

Introduction: The changes of the operative program lead to inefficient use of available operating ranges, and waste of resources. **Objective:** This study was conducted to evaluate the incidence, causes in the changes of the operating program and any consequences in order to find appropriate solutions for better patient management. **Materials and Methods:** It was of a study conducted in the potential services of anesthesiology of the Mohammed V military hospital in Rabat. Was included in the study changes the operating program (refusal, addition). Were excluded all the changes in the other operating sites. For any changes was completed farm return. The collected parameters were: age, sex, ASA, categories, the service concerns by adaptations, causes, the timing of the change and patient's outcomes. **Results:** From November 2020 to May 2021; 3620 were scheduled for elective surgical operations. Of these, 320 (8, 8 %) patient's operations were cancelled and 252 (7%) were added. The Urology department had the highest rate of cancellations (23, 4%). Causes related to patients represented 50 % of cancellation's rate, followed by causes related to the surgery 40% and finally those related to anesthesia in 10% of all cancellations. The absence of the patient during the intervention was the most common patient-related reason for cancellation (78.1 %), the most common surgery reason was not a sufficient time frame (55.5 %) and finally the non-availability of blood and up ICU (25% each), were those related to anesthesia. **Conclusion:** Changes in the operating program rate were high in comparison with reported rate worldwide. Efforts should be made for planning, programming and coordination between the different actors involved in the operational planning.

Keywords: Operating program, Cancellation, Additions, Changes, Anesthesia.

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INTRODUCTION

Over the past few years, numerous regulatory texts, recommendations for good practice and reference systems have been drawn up concerning the organization of the operating sector. However, the operation of the operating theater remains problematic and is considered the weak link in the chain of patient care.

Mastering the operation of the operating theater means implementing strategies that analyze not only dysfunctions, but also and above all the behavior of an individual within a system. As such, the functioning of the operating theater is a good example of inter and multidisciplinary coordination.

Unfortunately, the operating program presents several dysfunctions, in particular those related to the

disturbances which often modify the initial planning of the surgical interventions and which constitute the reality of the operating room.

For this we conducted a prospective study whose objective was to analyze changes in operating programs.

MATERIALS AND METHODS

This was a study carried out in the anesthesiology department over a period of 08 months from November 2020 to May 2021, in the central operating theater of the Mohammed V military hospital in Rabat. This was a prospective study analyzing the incidence, types, causes and consequences of changes in the operating program at the central operating theater of the Mohammed V military hospital in Rabat. Were included in the study, all the patients who appear on the

operating program and who are postponed and all those who are added and did not appear on the weekly operating program.

Patients operated in emergencies and in other sites outside the central operating theater were excluded from the study.

The following parameters were recorded for each change in the operating schedule:

Patient characteristics (age, gender, ASA class), Reasons for refusal (patient issues, surgery issues, anesthesia issues) Suites (rescheduling or discharge of the patient). For the additions we noted patient characteristics (age, gender, ASA class), Department concerned (Ophthalmology, Neurosurgery, Trauma, general surgery, ophthalmology, urology, stomatology) and the time of addition.

For each addition or refusal of a patient, the discussion took place between the surgical team, the anesthesia team and the head of the operating room. For each change, an exploitation sheet was completed and then exploited.

The retrieved questionnaires were analyzed and the resulting data entered. Statistical analysis was performed using SPSS software for Windows, version 10 (SPSS, Inc, Chicago, IL, USA). Qualitative variables were expressed as numbers and percentages and quantitative variables as mean \pm standard deviation.

RESULTS

During the study period, from November 2020 to May 2021, 3620 patients were scheduled. 320 patients were postponed for surgery with an incidence of 8.8% and 252 patients were added to the operating program with an incidence of 7%.

A/ Refused Patients:

Patient Characteristics:

- The mean age of the patients was 48.5 ± 19.2 years with extremes of 15 months and 95 years.
- During the study, there were 151 women and 165 men, slightly more than 50% of men compared to women.
- The majority of patients who were rejected were of the ASA1 class, a total of 206 patients out of 320 patients who were rejected. The incidence of recused patients varies by surgical specialty. The majority of rejected patients come from the urology department with 23.4%, followed by the ENT department with 16.6%, the gynecology department comes next with 15.6%, then the traumatology departments both combined with 14.1%, and the visceral the two also combined with 13.2% and finally follow the other services.
- The preponderant causes of objection are mainly related to the patient with 50% and then related to

surgery with 40% and to a small extent related to anesthesia with 10%.

A) Causes Related to the Patient:

The absence of the patient at the time of the intervention represented 78% of the patient-related causes and largely covered 3/4 of the patient-related reasons. It is supported by the patient's incomplete preparation, which represented less than 1/10th of the patient-related reasons.

b) Causes Related to Surgery:

The insufficient time slot due to over-scheduling of patient's remains the most important of the causes related to surgery at 55.5%, while in the background, we find the change in the surgical program which occupies a non-negligible share at more than 1/5th of the causes.

c) Causes Related to Anesthesia

The unavailability of bed in intensive care as well as the unavailability of blood are the major causes of recusal of the patients and occupy at least 1/4 each, causes related to anesthesia. They are closely followed by the anesthetic complication at 21.9%, then by the assessment not completed by a pre-anesthetic consultation at 18.8%.

271 patients were postponed while still in service, followed by 29 patients in the operating room before anesthesia, then 19 patients before entering the room and finally a single patient was recused after anesthesia.

The patient, after being recused, was declared either discharged or remained hospitalized pending scheduling. In our study, 103 patients were declared discharged and 217 patients remained hospitalized pending possible reprogramming.

9 patients among the 320 challenged patients had a second postponement of their interventions with one patient postponed three times, with an incidence of 2.8%.

The lack of bed in intensive care was the cause of the second postponement for more than half of the patients.

B/ Patients Added

252 patients were added to the operating program, 25% of whom came from the urology department. According to the hours of patient additions, we were able to classify the timing of patients into three groups. Either between 8 a.m. and 10 a.m. or between 10 a.m. and 12 p.m. or between 12 p.m. and 3 p.m. More than half of the patients were added between 12 p.m. and 3 p.m.

DISCUSSION

In recent years, many recommendations for good practice and benchmarks have been developed with the aim of improving the organization of the operating sector, but unfortunately, these favors and increases the number of patients scheduled for the operating program.

The analysis was made around three main headings, the incidence of patients postponed or added to the operating program, the causes of patient rejection, and those of patient additions.

A/ The Incidence

The incidence of changes in the operating program is an indicator of the efficiency of the operating room. During our study, the incidence of patients withdrawn from November 2014 to May 2015 was 8.8%, and that of patients added during this period was 7%.

These rates have been compared to those in the literature and remain quite high.

Some studies carried out in countries where socio-economic development is flourishing show us a very low incidence compared to our study.

Lau *et al.*, in his study conducted over a period of 05 years showed an incidence of 0.15% of cancellation [1]. Msamar also in a study carried out over one year showed a cancellation incidence of 3.6% [2].

On the other hand, Chiu and Kyoung shows results equivalent to those of our study, with a respective incidence of 7.6% [3], and 8.8% [4].

Studies carried out in African countries and developing countries show relatively very high rates. In Ethiopia an incidence of nearly 23% [5]. This is also the case of a study carried out over a period of 11 months carried out in the heart center Sultan of Saudi Arabia who showed a high incidence of cancellation, namely 23.27% [6]. In the same vein, a study conducted in Tanzania also carried out over a period of one year evaluated the incidence of cancellation at 21% [7].

B/Patient Characteristics:

1. **Sex:** The majority of rejected patients were represented by men at 51.8%, a value which is quite close to that of women at 49.2%. Other studies show practically the same results with a slight female predominance such as the study in Ethiopia with 54.4% female [5]. But it should be clarified that sex is in no way linked to the challenge of the patient. In both men and women, it occupies an equivalent portion.
2. **Class ASA:** In our study, the ASA1 class, namely that where the patient is healthy, represented the class in which several patients were rejected. On

the other hand, Douglas *et al.*, classified the majority of rejected patients in the ASA2 class [8].

C/ Refused Patients:

1) Breakdown of Patients by Service

The department of general surgery was found in most studies as being the department in which the rate of cancellation of the operating program is higher, followed by the traumatology department. Msamar *et al.*, reveals a proportion of more than 20% in favor of visceral surgery [2]. Chiu had also found visceral surgery in the foreground with a low proportion of 10% [3]. This is also the case in Ethiopia with more than 20% in favor of visceral surgery [5].

In our study, on the other hand, the urology department with 23.4% occupied first place, followed by the ENT (Oto-Rhino-Laryngology) department at 16.6%.

2) The Causes

Regarding the nature of the changes made to the operating program, in accordance with what has been raised in the literature, our investigation was able to determine that the main disturbances affecting it, are dominated by causes related to patients at 50% followed by causes related to surgery in 40% of cases and finally by causes related to anesthesia in 10% of cases.

Some studies conducted in this direction, had also found patients as being the main cause of refusal, Chang *et al.*, [9] which found 59% of the causes related to the patient, as well as that Yoon *et al.*, in 2009 [10] and Kyoung in 2014 with more than 60% [4].

On the other hand, other studies placed surgery in the foreground. Sultan *et al.*, in Saudi Arabia with more than 40% of causes related to surgery [6]. Chiu *et al.*, showed more than 50% of causes related to surgery [3].

Finally, other studies placed anesthesia at the forefront. This is the case of the study of Chalya *et al.*, with 82% of the causes related to anesthesia [7].

A) The Causes Inherent To Patients

According to the MEAH (mission nationale d'expertise et audit hospitaliers 2006) [11], the operating program can be subject to several disturbances, particularly those related to the patient, in this sense, it has argued that the elements which affect the course of the operating program are mainly:

1. *The degradation and complication of the patient's condition which becomes incompatible with anesthesia and may lead to an outright cancellation of the intervention.*
2. *The deterioration of the psychological state of the patient who becomes reluctant in the face of the operative act, or even to refuse this intervention, in*

this case the surgeon is obliged to postpone this operation.

Msmar *et al.*, specifies that the patient's psychological degradation could be the cause of his absence during the surgical intervention with a proportion of more than 70% linked to the patient's absence [2].

It is also from this perspective that the study conducted by Hammami [12] in 2007, explains that the patient's preoperative preparation, precisely the fortuitous discovery of the patient's non-compliance with the fast, and the therapeutic non-compliance, have an impact on the operating program. It is followed in the same direction by studies carried out in 2009 in an ophthalmology department which specified the role of therapeutic non-compliance in the operating program [13].

Other studies have also shown the role of non-compliance with fasting by the patient as being a major cause of refusal. Walker *et al.*, showed the role of the fasting person in surgical programming [14] and a study carried out in 1997 well before, which had also specified the role of the fasting person [15].

In the same way, the results of our study come to affirm what was previously reported, since the preponderant cause related to the patient hindering the respect of the operating program was represented by the deterioration of the psychological state according to 78.1% of the surveys; followed by the patient's incomplete preparation in 6.9% of the surveys, then the presence of an intercurrent event in 6.2% of the cases, then come the patient's refusal, therapeutic non-compliance and other causes in its proportions negligible.

On the other hand, the results of our study had been able to highlight the non-presentation of the patient within the operating program which may have been caused by the psychological and/or budgetary degradation which influences the non-respect of the operating program.

Chalya *et al.*, have a proportion of 30% of their surveys due to financial constraints [7].

B) Causes Related to Surgery

According to the results of our study, the majority of patients were rejected because of the time slot which was insufficient compared to the number of patients scheduled, equivalent to 55.5%, followed by the change of the program at 21.9%, then the absence of surgical equipment at 10.2%, while only 3% of patients were canceled due to the absence of the surgeon.

Studies in this direction have placed the insufficient time slot or over-scheduling as being the

most important cause of the postponement of the operating program, this is the case of the studies carried out in Korea [14], those in Ethiopia at a proportion 34.5% [5], others by Zafar [16], and Lacqua MJ [17].

Lau *et al.*, also specified the role of the time slot and the lack of equipment in non-compliance with the operating program [1]. The lack of material was also highlighted by Chiu *et al.*, [3].

Other studies have also shown the role of over-programming as the main factor in the refusal of the surgeon. Schofield *et al.*, in 2005 reported the role of over-programming in the operating program [20] and another study conducted in 2012 which showed the same cause [18].

On the other hand, in some studies, such as the one carried out in Saudi Arabia, the change of surgical indication represented 58% of the causes related to surgery, while the time slot represented 1% of the causes [6].

C) Causes Related to Anesthesia

The operating program is a process that requires an adaptable preparation for each patient by an anesthesiologist-resuscitator. For this an anesthetic evaluation must take into account: the initial complete evaluation; the anesthetic material needed for each patient, including resuscitation material; the availability of space in intensive care; the request for blood in the event of surgery with a hemorrhagic risk; anesthetic complications and several other factors.

According to our study, the overload of patients within the surgical resuscitation causes a cancellation of patients requiring an available place in intensive care unit, as a result 25% of patients are rejected, adding to this 25% due to the non-availability of blood, 21.9% of anesthetic complications, then evaluation not completed by a pre-anesthetic consultation in 18.8% of cases.

Chiu placed causes related to anesthesia in first place [3]; this study places anesthetic complications in the foreground with 41%, followed by the unavailability of places in intensive care at 23%. In the same vein, the lack of bed in intensive care was also reported by the study conducted in Jordan with 20.7% of the surveys [2].

Other studies have identified abnormalities in the operating room as well as the anesthetic complication as causes of objection related to anesthesia. This is the case of a study carried out in 2001 by Mark M. SMITH [19].

The non-availability of blood occupied very low proportions in the literature compared to that carried out during our study which presented very

significant proportions in the same way as the lack of bed in intensive care.

3) Cancellation Timing

The postponement of the operating program after the patient has returned to the operating room is the basis of real financial losses for the hospital.

It would not be appropriate to directly compare the frequency of deferrals made on patients already prepared for surgery and deferrals for patients who are still in service.

In our study, the cancellation timing had covered all the facets of the patient's location at the time of the postponement, namely the cancellation while the patient is still in the service, the one before entering the room, before the anesthesia and after anesthesia.

Chang compared the rate of cancellation of the operating program between two groups, namely, the group whose patients have already benefited from anesthesia which included 12.7 % the minimal portion and that whose patients had not yet benefited from anesthesia and occupied 87.3% of the surveys [9]. A study in thoracic and cardiovascular surgery also made the same findings with 18% of patients having benefited from anesthesia, and 82% of patients not having benefited from anesthesia [19].

In our study, the majority of patients at 84.7 were still in service when the operating program was postponed, which presents a better financial situation for the hospital, but nevertheless increases the length of the patient's stay and also reduces the number of places available.

9.1% of patients were recused before anesthesia and 0.3% after anesthesia.

4) Becoming of the Patient

After the cancellation of a surgical intervention, some patients are declared discharged, others, on the other hand, remain hospitalized in the Surgery departments pending a new programming.

In our study, 67.8% or more than 2/3 of the patients remain in the services, while 1/3 of the patients or 32.2% of the patients were declared discharged.

Lau *et al.*, found a considerable proportion of patients who were able to benefit from a new intervention before 06 months at 49.3% of cases, 33.3% were declared discharged, while that 13.4% of patients died during hospitalization [1].

The risk for these patients who remain hospitalized while awaiting surgery is death, as in the above study. But they will also be forced to suffer the consequences which will be linked to the evolution of

the pathology on the one hand, to the occupation of the hospital beds on the other hand, or even to the hospital cost and the uncertainty of a rescheduling date. These consequences could also be a source of stress for the family.

In our study, we were not able to do in-depth research on the future of these patients in the long term.

5) Second Report

The incidence of the second postponement is 2.8%, which is considerable given the pain and damage exerted on the patient. In our study, a patient was postponed three times in a row because of the lack of bed in intensive care unit. This lack is a big problem to raise, because it is also preponderant in the causes of the first refusal of the patient and at a considerable rate. In our study, 56% of patients were postponed a second time because of the lack of bed in intensive care. Msmar have highlighted the lack of space factor in more than 70% of cases as being the one that caused more challenges, hence also a second postponement factor [2].

D/Patients Added

252 patients were added to the operating program. 25.8% of these patients came from the urology department. Previously, our study had shown that the urology department was the one with the most patients rejected at 23.4%. Then followed by the visceral surgery department at 13.1%. On the other hand, this service occupied the fifth place for the patients refused with 13.2%.

The analysis of the timing of the insertion of the patients in the operating program was done according to the schedules. In our study, the majority of patients were added in the interval from 12 p.m. to 3 p.m. with 51.6% of patients. Then at 28.2% the interval between 10 a.m. and 12 a.m. occupies the second place of the timing.

E) Recommendations

At the end of our study, it emerged that non-compliance with the operating program was the result of a combination of several causes, related to the patient, to the surgery, to the anesthesia. Based on this observation, suggestions are necessary in order to be able to confer optimal stability on the operating program and to minimize as much as possible the disturbances which affect it.

1) On the Patient Side

It would be better:

- *To take into account the psychological state of the patient and give him all the necessary information to avoid as much as possible the absence of the patient at the time of the intervention.*

- To make an adequate assessment for each scheduled patient in order to avoid any incomplete preparation.
- Prepare patients well to avoid any intercurrent event.
- To inform patients about the perioperative course as well as the precautions to be taken, the ins and outs of their pathology.

2) On the Surgical Level

It will be necessary:

- Insert a room reserved for scheduled emergencies.
- Optimize working hours.
- Reinforce the operating theater with teams, staff and operating rooms.
- Good organization of the surgical team.
- Preparation of all the necessary equipment for scheduled interventions

3) On the Anesthetic Level:

It would be desirable to undertake:

- An improvement in the supply of the post-intervention monitoring room, in terms of material resources.
- Provide intermediate care units to compensate for the lack of places in intensive care.
- Adequate blood supply when needed.
- Good coordination between the various stakeholders in the operational planning.

CONCLUSION

The operation of the operating theater is a chain of continuous activity processes in which the management of risks and malfunctions is fundamental to ensure the safety and satisfaction of the patient.

The incidence of changes in the operating program such as postponement and additions are frequent. Most of the causes of these changes are potentially preventable and a large majority is patient-related.

In order to remedy these disorders and to potentiate the efficiency of the operating room, efforts should be made for the standardization of practices, the coordination between the various teams involved and the planning of the reorganization of the structures.

Funding: None.

Conflict of Interest: None.

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