Bed Crisis and Elective Surgery Late Cancellations: An Approach Using the Theory of Constraints

Dr. Abderrazak Sahraoui, Dr. Mohamed Elarref

Introduction

The classical and simplistic approach to solving the problem of late cancellations focuses on finding the causes of these cancellations, and then to provide a solution for each cause individually, or collectively for the most frequent cause (Table 3). Statistical methods to compare rates of cancellations have been suggested. Some of them are valid to compare and to evaluate the different cancellation rates but they are not able to identify indirect causes of those cancellations, or to order them on such a way to find out the main underlying causes of cancellations. An alternative approach is to apply the theory of constraints as published by Eliyahu Goldratt in 1984 in his book “The Goal.” According to the theory of constraints, late cancellations of surgical care are just undeniable effects of underlying causes. In our case, the rate of late cancellations will be studied at Hamad General Hospital. This paper shows our approach to implement that theory.

Objectives

Our main objectives are:

- To find the real cause of the cancellations by using the theory of constraints.
- To avoid the remedial solutions to the problem.

Methods

The problem of late elective surgical cancellations was studied by applying the theory of constraints, which is based on the following five focusing steps:

Step 1: Identification of the constraint

Step 2: Exploitation of the constraint

Step 3: Subordination of all other processes to the above decision

Step 4: Elimination of the constraint

Step 5: Avoidance of inertia

To implement the first step of the theory, we conducted a Pareto chart review analysis of the elective surgical cases recorded during an eight-month period, from January 1st to August 31st in 2013.

During the mentioned eight-month study period, we recorded 4458 bookings for elective surgery. Among them only 3872 cases were serviced. The remaining 586 cases were canceled or postponed. Following this, data analysis was conducted according to different approaches.

The second approach used was qualitative and focused only on the main causes of cancellations identified by the implementation of Pareto’s law. It uses the thinking process of theory of constraints and allows one to find the underlying or indirect causes, even those which are behind human behavior. The main underlying cause was considered the constraint.

The third step of the theory, we reviewed literature to search for the most practical and focused only on the main causes of cancellations, and then to provide a solution for each cause individually, or collectively for the most frequent cause of cancellations. Statistical methods to compare rates of cancellations have been suggested. Some of them are valid to compare and to evaluate the different cancellation rates but they are not able to identify indirect causes of those cancellations, or to order them on such a way to find out the main underlying causes of cancellations.

Discussion

To follow the theory of constraints analytic process, as described earlier, we will discuss the five focusing steps step-by-step.

Step 1: Identification of the Constraint

The quantitative approach

Our rate of elective surgery cancellations is comparable to the rates reported in studies of other hospitals such as 12.3% at a major Australian tertiary hospital (3) and 13.3% at a United States Atlanta teaching hospital (5) and 9% and 13% at United States Chicago Hospital(13) and 12.4% in a German University hospital (23) in our study, there is no significant difference between our results and those studies. In our study, we used the number of cancellations as an indicator. By applying Goldratt’s principle to types of surgery, we found that for both outpatient or inpatients, the most frequent causes of surgery were responsible for 76.62% of the cancellations (Table 4) which is well represented by the Pareto chart (Figure 2).

Applying Pareto’s Principle to the causes of cancellations, we find that four causes are responsible for 76.94% of cancellations (Table 5). Those causes are over-booking, patient no-show, unfitness for anesthesia and unfitness for surgery which is well represented by the breakdown of the Pareto chart (Figure 2).

Any reductions for the causes of those cancellations will significantly affect the overall rate of cancellations.

The qualitative approach

Following the theory of constraints, late cancellation is not a problem but just an undesirable effect. The first step aims to identify the main underlying cause. Some of the most common underlying causes are presented in Table 6. The most common and most frequent underlying causes are evidenced, the bed crisis. Hence, it is the core problem and the weakest link in the surgical care chain. The bed crisis restricts the whole system output. This is confirmed by the huge pre-admission waiting list. Bed crisis is also reflected in many surgeons’ behaviors, patient behaviors and clinical conditions (Figure 6). Table 6 includes the main apparent causes of cancellation with their respective underlying causes. Each underlying cause is followed by an example illustrating how it leads to the apparent effect.

In our opinion, there is no doubt that our actual constraint is the bed crisis but nevertheless, it remains a probable core problem and can only be confirmed by the dramatic improvement obtained by the following steps of the theory of constraints cycle.

Conclusion

Applying a managerial approach using the theory of constraints, we demonstrated that late cancellations of patients on surgical care in Hamad General Hospital are not more than an undesirable effect of the bed crisis. Workable and effective solutions to reduce cancellation rate are provided in this study. Confirmation of the finding will be obtained by a new study independent following the different steps of implementation. If no improvement is observed, a new cycle has to start looking for another constraint problem. Once the constraints of cancellations applied to the surgical care service is what will ensure its ongoing improvement.

Tables and Figures

Table 1: Types of surgery and rates of cancellations

Table 2: Cancellations by status of patients

Table 3: Types of surgery and rates of cancellations

Table 4: Reasons of Cancellation

Table 5: Reasons of Cancellation

Table 6: Reasons of Cancellation

References


