PROFILE OF THE USE OF RESSOURCES IN A SURGERY CLINICS

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ABSTRACT

The continuously increasing amount of funds which the healthcare requires put in front of the healthcare officers the problem for a more efficient economic distribution and spending of the healthcare resources.

The efficiency is related both to the achieved end results of the treatment, which is important for the patients, and to the economic results for the funds invested in treatment activity and the achieved results.

The concentration of a significant amount of personnel, material and financial funds in the Surgery Clinics of University HFAT "Queen Joanna" – Sofia make the issue about their use very actual.

Key words: profile of resource use, surgery clinics, efficiency, volume of activity

The amount of activity, which the Surgery Clinics could perform as a production centre, is determined by the resources it provides with and by the extent these resources are being used /closely related with the organizational model of the resources/. This centre has a series of features relating to the provisioning, use and organization of the resources and these features should be systematically analyzed in order for the analyst to be able to provide answers to the three basic questions, which could have the following wording: Are the current resources used to a lesser or greater extent? Are they being used in an appropriate or inappropriate manner (with a view to the efficiency of use)? And as a result of the answers to this both questions, what reserves or what amount of unused capacity exist? (1)

To provide answers to the first two questions means to know the profile of use of the resources, the determination of the unused capacity (within an extent of activity), however, obliges us to optimize the use of the present resources (whether by means of possible organizational changes or by means of

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improving the efficiency of the resource use). This analysis shall allow us to determine which types of servicing could use its resources better and which have a reserve capacity. Last but not least, within the framework of the process of hospital microplanning one should adjust the resources of the Clinics (to re-distribute them, if necessary or to increase them, if possible) with regard to the Clinics' goals.

The purpose of the research is to analyze the profile of the use of resources in the Surgery Clinics of University HFAT "Queen Joanna" – Sofia.

Method – mathematic and statistic one

Time and place of the observation

According to the goal and the purposes of the research we have assumed to observe the information over the activity of the Surgery Clinics University HFAT "Queen Joanna" – Sofia over a five year long period from 1st January 2000 to 31st December 2004.

2002 and 2004 are periods with disorders in the rhythm of work of the Surgery Clinics. The merging of the Abdominal Surgery Clinics with the Urgent Surgery Clinics in 2002 results in breaking of the work process, as it is an administrative cataclysm. And in the summer of 2004 there has been started a general repair.

RESULTS

In the Surgery Clinics there coefficient between surgeons working and operations performed is 1 surgeon pre 150 big and middle sized operations with 2 surgeons for assistance. The clinics is a referent one and because of this there is personnel engaged in scientific and research work and in study work with students.

The medical personnel provides for the entire set of cares for the patients with regard to the diagnostic researches, the medicine and operative treatment, the pre-operative and post-operative cares and procedures.

With regard to the material basis of the Clinics one could say, that the medical equipment, resulting from the subject of its activity, as well as its communication facilities are all in compliance with the legal requirements.

The modern medicine equipment and appliances which the Clinics has, are in compliance with the requirements of the National Health Insurance Fund on the conclusion of contract for hospital assistance.

The actual structure of the Clinics, which has currently 45 beds, a surgery room and an urgent surgery room is in compliance with the subject of activity of the Clinics and with the requirements of Ordinance Nr. 29/1999 of the Ministry of Health.

Within the framework of the process of hospital microplanning one should adjust the clinics' resources (to re-distribute them, if necessary or to increase them, if possible) with regard to the Clinics' goals.
We focus on the necessity of existence of a close link between the present resources and the amount of work.

As it is already known the description of the profile of use of these resources is done by means of an analysis of two basic definitions: (2)

• The extent of use of the resources shows the link between the real use of the resources and their maximum theoretical capacity. The maximum use of resources means a hundred percent use of the maximum theoretical capacity.
• The efficiency of use of the current resources reflects the link between achieving the goals (medical servicing) and the outlay of resources. The optimum level of efficiency is obtained when one uses adequate level of resources in order to achieve a particular type of activity (of use).

The description of the profile of the use of resources could be analyzed for every type for physical resource, to which a particular type of servicing in a clinics has been assigned.

I. Level of use of the resources

The level of use of the resources in the Surgery Clinics for the examined period has been calculated by us on the following basic indicators:

Employment index

The first physical resource are the bed for hospitalization. It is necessary to establish a relation between the real use of the bed and their maximum theoretical use.

One should calculate the rate or the occupancy index, as the divisor is the maximum amount of possible stays for a specified period of time and the numerator is the actual number of hospital stays within this period.

$$OI = \frac{\text{patients entered} \times \text{average number of days in the hospital}}{\text{number of beds} \times \text{number of days (for the period)}} \cdot 100$$

(1)

As one could clearly see from **Fig. 1** the occupancy index for the Surgery Clinics in 2002 has been 63.36%, in 2003 – 76.90% and in 2004 it has a decrease and amounts to 58.90%.

One considers the optimum occupancy index to be 85%, since it allows having a specific number of unoccupied beds, which provide the opportunity for flexibility when receiving both urgent and not urgent cases. The improvement of occupancy index until it reaches optimum values could be possible by means of influence

over the variables relating to the numerator in the formula, namely the number of entered patients and average stay, or relating to the divisor – number of beds. In order to go from 76% to 85% occupancy one should have to increase the use of beds, i.e. the number of the used daybeds (which means to increase the entry of patients) or to decrease the number of beds, if the first possibility is not applicable. (3)
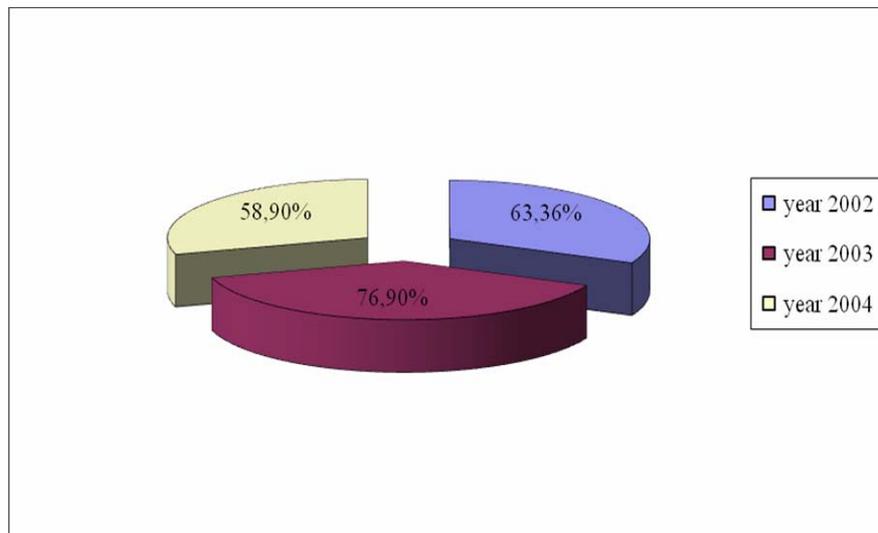

Figure 1. Occupancy index

Performance of the operation rooms
In this case the physical resource are the operation rooms. One should establish once again for a specific period of time the coefficient between the time of use of the surgery rooms and the theoretic time, corresponding to a particular type of intervention. This rate is referred to as productivity of the surgery rooms (PSR). In order to calculate this one should know the used surgery time (UST) and theoretical surgery time (TST). (2)

For the calculation of TST one should indicate what amount of surgery time one has: the number of operations, the period of time and the hours of theoretic functioning of every surgery room.

$$TST = \text{number of operations (for the period)} \times \text{hours of operation} \times 60 \text{ (in min.)}.$$

(2)

The calculation of UST is more complex. For this purpose it is necessary to know the total time used for performing the total amount of all interventions, whether they include entry of the patient into the hospital or just ambulatory interventions, for a particular period of time. There are two possible ways to perform depending on whether the details on the activity and time of use of a surgery unit are presented as information.

$$UST = (\text{number of interventions with hospitalization} \times \text{average duration}) + (\text{number of ambulatory interventions} \times \text{average duration})$$

(3)

$$PSR = \frac{UST}{TST} \cdot 100$$

(4)

The surgery unit is one of the hospital areas, which are equipped with most human and technical resources. The determination of this resource for every type of surgery activity means determining the physical space, the entire personnel of the surgery unit

(anaesthetists, nurses, hospital attendants etc.) and of the technical resources. The surgery unit should be programmed for maximum occupancy.

Performance of the doctor rooms
Just as it is with the operation rooms, here again the issue is to determine the ratio between time, used for consultations and the theoretical time which we have. This ration is referred to as performance of doctor's consultation (PDC). In order to calculate it one

should determine the theoretical consultation time (TCT) and the time used for consultation (TUC).

The calculation of TCT is easy if we know the time, which is available for a specific type of consultation. One should know the number of consultations for the period of time, which we are interested in and there should be implemented only the working hours of each doctor room.

$$TCT = \text{number of doctor rooms (for the period) . working hours . 60 (in minutes)}$$

(5)

$$TUC = (\text{number of first visits . average duration}) + (\text{number of following visits . average duration})$$

(6)

$$PDC = \frac{TUC}{TCT} \cdot 100$$

(7)

One of the ways for getting a notion about the use of the doctor rooms is to calculate the number of examined patients in every single room. The organization of this resource as well as of any other is of great importance in the pursuit of optimum levels of use: it is not one and the same when there are specialized and polyvalent doctor rooms.

After a certain decrease of the examinations from 6934 to 3732 and of the worked out hours from 10569 to 8350 in the urgent surgery room and the surgery room for the years 2001 and 2002, which was due to a decrease in the number of beds from 64 to 40, we observe again an increase in the following years, namely 6755 examinations and 10531 worked out hours. We recommend that this trend should be maintained.

II. Efficiency of the use
As it is already known, this is the second definition of the profile of use of resources. The extent of efficiency should show the coefficient between the result of the activity and the outlay of resources. Achieving an optimal extent of efficiency means achieving a specific extent of activity with optimum extent of resources. This means that the outlay of

resources should become adequate to the activity. (2)

Through the number of the hospital beds one calculates the first element of the profile of use: the occupancy index. Regardless of whether the beds are used to a greater or lesser extent, from the point of view of efficiency the stay could be adequate or not. The stay is a classical intermediate product and as such it is used for placing a diagnose and/or treatment of patients.

The number of beddays for every single patient is determined by the disease and depends directly on the clinical estimation of the doctor. It depends on outer factors, too, which are different than the doctor's decision itself and are typical for the performance processes in other units.

The efficient use of hospital beds is based on the total efficiency of secondary or medicine performance (coordinating the beddays with the optimum number for the typology of every single patient) and on the primary and technical performance (when it is not resulting in unnecessary prolongation of the beddays).

In order to measure the efficiency in the use of hospital beds, one takes the average stay (AS), which is calculated as one divides the number of the bed-days used within a specified period of time to the number of the patients, who have entered the hospital for the same period of time. (4)

$$AS \text{ (in days)} = \frac{\text{total number of the bed-days (for the period)}}{\text{total number of the patients entered (for the period)}}$$

(8)

The average hospital stay is the usual information which is given when presenting the details over the activity of a particular hospital. It is used also when one compares the activity of the different hospitals and when one analyzes the development of a particular hospital in the course of time.

We can notice a positive trend towards its decrease within the examined period. **(Fig. 2)** The data are as follows: in 2000 the average stay for Abdominal Surgery has been 11.25 days, and for Urgent Surgery – 9.83 days; in 2001 for Abdominal Surgery it has been 9.66 days and for Urgent Surgery – 8.81 days; in 2002 for Surgery Clinics it has been 7.46 days; in 2003 it has been 7.68 days and in 2004 it has been 6.42 days.
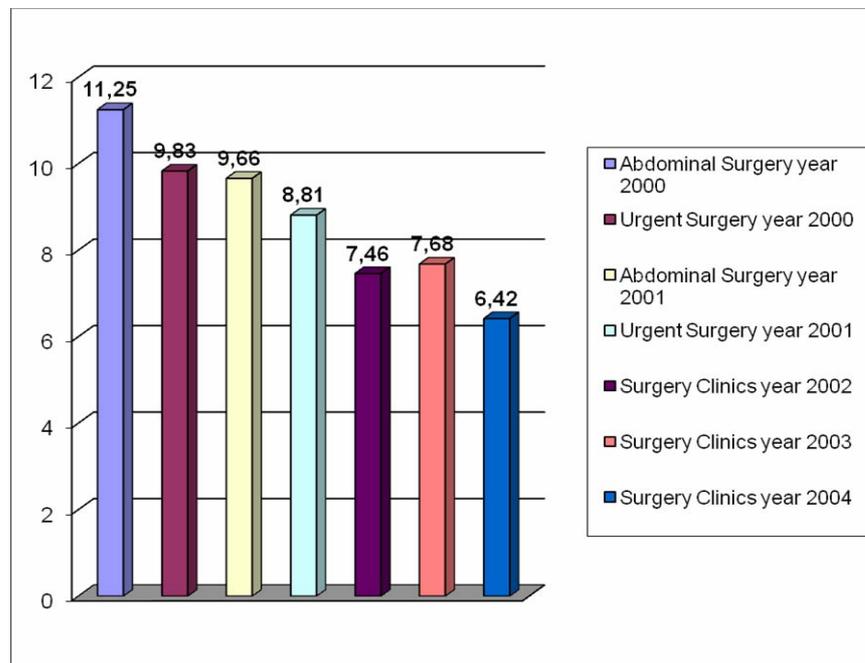

Figure 2. Average stay

CONCLUSIONS

In order to achieve a favourable outcome of the disease with a rational use of the hospital resources it is necessary that the diagnostic and treatment process in the Clinics should secure their efficient use.

There must be a close relations between the current resources and the volume of activity: the more resources, the greater activity and vice versa. This principle is a simple one, however we have to go from there in order to draw the necessary conclusions at a later stage. In this way in order to establish the needs of resources of a particular unit, one should first know the extent of the activity, which should be undertaken. This is valid for planning the establishment of a new type of servicing in the hospital. The principle, however, is the reverse one and one should start from servicing for which there has been already assigned specific resources, which perform a specific type of activity and so they have to be re-distributed several times. The description of the profile of use of resources shall be beneficial in order to see whether the resources are in compliance with the activity.

The professional use of the rich amount of information which is related to the diagnostic and treatment process supports both its planning, organization, funding, control, assessment and prognostication, and its reflection in the entire activity of the Clinics.

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