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Article

Value Stream Cost Analysis of the Suture Logistic Processes

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Abstract: Efficiency is key in healthcare supply chain management, especially in surgery, which generates revenue but also incurs significant costs. To cope with increasing demand and stagnant budgets, optimizing processes is essential, with potential operational savings being reinvested. Shifting focus from product supply to solution provision is necessary through new contracting formulas and relationship models, prioritizing value-added actions with a patient-centric approach. This article presents a cost analysis of suture logistic processes from a University Hospital, aiming to develop efficient and safer surgical closure and processes by identifying areas for improvement, promoting cultural change, clinical excellence and proposing operational savings actions. Facilitating value-based healthcare requires attention to the quality of assistance provided, including from the perspective of sutures. This study aimed to analyze the costs related to suture management within the surgical area and diagnose the logistic processes related, to propose solutions for a more efficient and safer surgical closure and suture management process. The analysis was conducted using two blocks of actions: process efficiency and adequacy of clinical practice.

Keywords: Lean healthcare; Value Stream Cost; hospital management; economic impact; surgical process.

Highlights

- Surgical process is a healthcare activity that involves high levels of human and material resources
- In the current context, it's essential to optimize healthcare processes and win efficiency
- Priority of healthcare management always must be increase patients' safety and satisfaction
- Standardization can lead to improvements in clinical practice and patient outcomes
- Efficiency is key in healthcare supply chain management, especially in surgery
- Operational savings can be achieved through efficient stock management and preparation time
- It is possible to reduce around 10% of overconsumption of sutures and 30% of the time of reposition
- Good Processes = Good Results = Value Based Healthcare

Introduction

The activity of surgery today represents one of the main sources of financing of tertiary care hospitals, and managing the resources that are required to carry out this activity is the key to sustainability of the health system [1]. Major efforts are being made, and have been for years, to develop efficient surgical management models [2], and with the introduction of logistics management

in the surgical process [3], very high levels of performance and efficiency have been reached, while also providing an increase in patient safety and in healthcare staff satisfaction [4]. Various studies and experiences related to implementing logistics efficiency projects in the surgical area have been published, some of which experiences have not always been successful. This article provides another example of improvement in the efficiency of the surgical unit, in this case focused on the sutures process. Great results have been obtained, reproduced at several hospitals of Spain, with the added value of the perception of real value by professionals.

Healthcare logistics management is essential for hospital management, given that it has a direct impact on the efficiency and quality of healthcare services [6], and it can contribute a new approach in the use of Performance Measurement Systems (PMSs) among hospital administrators in relation to operational performance and the work culture [7]. This article therefore analyses the logistics process associated with sutures and the costs thereof at a hospital, with the aim of detecting improvement opportunities and optimizing nursing and stock management tasks, as well as optimizing the costs linked to the healthcare activity.

It should be noted that optimization of the logistics processes in healthcare management is a growing trend, given that has a proven impact on efficiency, safety and patient satisfaction. Indeed, errors in the distribution of medical materials can represent a potential risk to patient health [8], and the availability of supplies and efficient care are also key factors in the patient's experience [5]. There are an ever-increasing number of studies that highlight the importance of optimizing logistics to ensure the availability of supplies, reduce costs and improve the quality of healthcare [3].

This project applies the methodology of advanced processes based on the principles of operations management, patient safety and experience, improvement of clinical practice and other methodologies adapted to hospital management. Using this methodology, the article proposes that common consensuses be standardized and established regarding procedures and clinical pathways that have a direct impact on the logistics process in the surgical area, with the objective of improving not only safety but also the satisfaction of the professionals involved. The clinical team of surgeons and nurses is a key piece in this process, and the final result is increased quality, increased safety in clinical practice and methodological innovation [9].

Within this context, the article defines and provides examples of technical and organizational aspects for implementing a project for improving logistics-related processes within the surgical units of tertiary care hospitals.

The main objective of the study is to conduct a dual analysis – both clinical and logistical – regarding the process of selecting the appropriate product and the logistics management associated with the supply of sutures up to the consumption point, thereby identifying improvement opportunities related to product management and the costs associated with the process. The following are at the basis of this objective:

- An analysis, through the expert knowledge of a supply company [10], of the current use of all sutures used in surgery to detect the standardization potential of needs and the improvement of clinical practice.
- The creation of logistics process maps, thereby identifying the costs and tasks of healthcare and non-healthcare staff.
- The detection of improvement opportunities in the logistics process and a proposal of actions that involve an operational savings for hospitals [11].
- Promoting cultural change [12].

Based on the context of the surgical environment, the following insights are notable:

- The market is evolving and is transforming with new relationship models.
- The current business models of suppliers must be improved, therefore acting co-responsibly in the processes of hospitals by creating new approaches in shared management.

- Hospitals need overall management solutions through results-oriented processes and models [13].

As major points of the context within which the study on the process of Sutures is developed, we would highlight the following:

- The surgical process in general needs to gain efficiency in all flows [14]. The surgical area is the one that generates the most income in the activity of a hospital, usually representing between 50% and 65% of total revenue. But the Surgical Unit is also a generator of major costs, in both materials and staff. At a general hospital, close to 50% of the hospital's costs are in human resources, while materials can represent between 35% and 40% of overall costs. It is essential that processes be improved so that an increase in healthcare demand can be handled while sustaining a foreseeable stagnation of or decline in government budgets allocated to healthcare[1], in addition to an upward trend in the price of supplies.
- A number of experiences have proved that there is great potential for operational savings in the surgical area [15], which healthcare managers must detect and reinvest in the process [16].
- It is evident that the market needs new formulas for contracting, such as Added-Value Agreements, and new relationship models to change the approach from a supplier-provider to a provider that is part of the solution thanks to the service they offer [17].
- The model proposed by providers is oriented at not merely selling a high-quality product, rather at offering solutions to hospitals and their professionals to contribute value in every action, while placing the patient in the focal point of the process and using efficiency outcomes as the basis.

As improvement aspects to consider within the context of the project, we would highlight the following:

- The logistics circuit of Sutures is a small part of the overall logistics process, and it generally represents few problems for managers, wherefore there is no awareness about the underlying potential for improvement [18]. The logistics of Sutures is not given the importance it has, either at the healthcare level or at the level of the potential time savings for preparation and management by the healthcare staff, even though in a standard surgical unit the average consumption volume is 500 to 800 units per day.
- The study requires an important phase of process auditing and re-engineering in order to be able to understand, raise awareness about and present the potential improvements offered in each surgical process of every hospital. In all surgical units, there is major potential for improvement and operational savings.
- In general, the purchasing policies of hospitals are focused on the price and not on purchasing services and/or solutions.

As a conclusion regarding the proposed context, we believe that the study's approach is correct, although the improvement potential is not merely a matter of improving the supply process of sutures, rather it goes further and involves the proposal of new management models.

The study takes into account the various objectives sought by each one of the main players in the process:

- In general, quality standards on use of the product are highly lacking.
- There could be major unawareness about the wide variety of products and the entire catalogue offered by suppliers.

- The main motivation of purchasing departments or management continues to be highly related to the acquisition price.
- Currently, the majority of healthcare centers are not itemizing the particular costs of each surgery, wherefore there is considerable unawareness about the unit costs per procedure.
- On the other hand, costs need to be reduced in the surgical area, especially in the logistics flow.

Digitalization of the consumption of materials is not optimized. It is a sector that offers major opportunities for transformation, which will require data on the process as we head towards payment for health outcomes in the not too distant future [19].

Method

From the point of view of improvement in surgical processes, a change of approach is proposed, based on promoting a management model that initially prioritizes patient safety as the main focal point, in addition to improving clinical practice and the efficiency of processes.

In this regard, current use of the catalogue of sutures at hospitals is emphasized to detect if procedures are updated with new products and to exhibit new product references of high-performance sutures that contribute clear improvement in patient recovery and better post-surgical results.

The focus on processes means analyzing the general flow of activity, thereby linking the patient flow to the logistics flow of materials that are necessary for each surgery. Upon studying the overall surgical process, different areas of improvement are detected in the planning and preparation of operating theatres, which would optimize the resources of the unit and facilitate fine-tuning for surgery. Surgical scheduling therefore ends up being linked to standardizing the list of sutures for each operation, thereby contributing to patient safety and assurance of the supply.

The value proposal for improvement of the Sutures process can be framed within the Value-based Healthcare (VBHC) plan [20], in which value is defined as patient outcomes related to the costs of obtaining those outcomes. Although, before proposing a model based on clinical outcomes, which is still difficult to do and demonstrate due to the lack of standardization and support tools that can reliably monitor these outcomes, it seems more appropriate to associate the value proposal with a Value-based Procurement (VBP) model.

Acquisition based on value consists in making purchasing decisions that consider how a product or solution can better offer the outcomes that are being measured and reduce the overall cost of care, instead of focusing solely on purchasing a specific product at a lower price.

This concept seeks to change the current customer-supplier relationship that exists between industry and hospitals towards one of a partnership for supplying the right product for each patient, at the right time and at the best price, focused on outcomes based on patient recovery (Figure 1).

Results

The study is focused exclusively on detecting the needs of the logistics process of sutures, subsequently diagnosing the baseline status and the optimization needs of the studied process so that relevant information can be offered for decision-making.

The preliminary analysis allows an initial evaluation to determine the current state and orient the improvement project, depending on the needs of each hospital based on known problems, purchasing data and recorded consumption. It is very important to not only have the cooperation of the heads of the surgical unit, of purchasing and of logistics but also set up a participatory and multidisciplinary group for analysis and improvement of the process.

For analyzing the process and the current situation, it is important to produce a Value Stream Map (VSM), thereby identifying problems related to the logistics flow and the communication of needs [21]. The map is complemented by data regarding demand and the resources involved.

This analysis of the current standard serves to analyze how each group works and analyze the associated problems of coordination, communication, logistics flow, etc.

In this case, the evaluation is focused on studying the logistics process for the purchase, storage, consumption and replenishment of sutures in order to be able to define specific actions and lines of work to improve the logistics process of sutures.

Analysis of the data and observation

In the initial phase of the study, purchasing and consumption data on all sutures used at a hospital must be analyzed so that a quantitative and qualitative report on the logistics process can be drawn up (number of references, inventories, product rotation, staff involved in the logistics process, costs of the process, etc.) and to have a view of the current state of needs related to the product.

Apart from the data analysis, observing the process together with the professionals who lead it is essential to understanding their current and future vision of their daily work. Using this information, a report of results can be drafted, which establishes the starting point of the study, including some improvement proposals and the expected impact on the logistics process.

Observation and analysis at the surgical unit includes several stages: an analysis of the structure and of the storage locations, an analysis of the Inventory Management Process, a Product Flow Analysis, an Analysis of Traceability in Materials Management and, finally, an Analysis of the Consumption and Replenishment Process of the Material.

The analysis of the structure and of the surgical storage locations consists in observing and determining the existing locations for surgical materials in the surgery areas. It is important to differentiate between "official" locations recognized by the hospital's logistics system and "unofficial" ones that are not included in the same replenishment dynamic, given that they are not included in the storage system and are managed directly by the nursing teams of the hospital. The direct consequence is an increase in the cost of management and replenishment, as well as added responsibility for the process by nursing.

The analysis of the inventory management process seeks to determine, for example, if all the product references used in the surgery unit are included in the management process, if there are management and consumption indicators, if there are duplicate references of products and if the inventory status is provided in real time.

The **product flow analysis** consists in observing if the circuit is optimal and if it is well defined, if the product is distributed internally in the best possible format according to needs, if overall and permanent control of expiry dates is established and if there is automatic control of replenishment that includes all the suture products.

The objective of the **traceability analysis** in management of the material is to detect if there is secure and permanent identification of the material; if all locations are well defined, correctly managed and recognized by the system; if the structure of the cost centers is optimal; and if there are defined and controlled traceability indicators (batch number and expiry).

The **analysis of the consumption and replenishment process** of the material allows detecting if there is a clear and complete process at all logistics points, if there is a defined process for the replenishment of additional material during a surgical procedure, if there is a clear distribution of the roles and the responsibility of the staff involved, if there are replenishment tools connected to the hospital's system for 100% of the materials and if there are adequately defined and measured indicators.

Analysis of the logistics process and of the associated costs

The analysis of the logistics process, together with standardization of the use of sutures and with control related to possible sub-consumption, determines the final cost study of the project. To analyze the total costs, not only must the product purchase cost be taken into account, the costs of the complete logistics process over one year also need to be added, which include the costs of distribution and storage, the purchasing line cost and the replenishment cost (of both the supplier and the

hospital's own nursing team). For this type of product, the cost of final elimination of the waste is minimal and has not been taken into account in the study.

If only the direct cost estimate is taken into account based on the purchase of the product, a set of hidden costs that determine the efficiency of the overall logistics process are lost.

Costs are not solely attributable to the buyer, given that part of the costs are assumed by the supplier. It is therefore essential to analyze the process from the viewpoint of costs of the value chain through VSC.

Value Stream Costing (VSC) calculates the costs of the value chain. It is a process of identifying and establishing costs for all steps of the process that are necessary for delivering value to the user. It is a function for determining how much value or cost is created in each part of the process, therefore tracing all steps associated with an activity between the supplier and the user. Mapping of the value stream is a key element of the Lean methodology [22] and represents an attempt to focus on and deliver value to the hospital, to identify the waste running through all steps of the process and to determine how much value and cost is associated with each action.

Activities that do not contribute value to the hospital are considered to have no added value: these are the steps that need to be identified and eliminated from the process, or at least minimized, in order to reduce their impact on costs. The cost mapping and analysis must begin at the supplier and continue throughout the logistics process until the end of the cycle, either as waste or as material to be reused.

Understanding the activities of the value chain is a fairly simple process. From a practical point of view, calculating the costs of the different value streams backwards from consumption at the patient to the source is more revealing than what traditional cost accounting systems provide. The analysis and calculation of costs based on activities is a tool that can be used to help analyze the activities of the value chain. The correlation of the value stream must be applied and assessed from the hospital's point of view. Activities of the value chain that provide the greatest impact on earnings must be given priority.

In the logistics process of sutures, the acquisition price is the determining factor, given that it represents between 85% and 92% **of the total costs of the process**, but in VSC, apart from the acquisition cost of the product, the following are emphasized:

- Order costs: these are the costs associated with placing an order. Some hospitals have purchasing departments, where a cost per order line is frequently assumed. These costs, knowing that each suture has a reference number and that the hospital has different cost centers (locations), represent a very high annual amount.
- Cost of transport: this is the cost associated with the replenishment of a new product. Depending on the space reserved for these products in storage, there will be a higher or lower number of weekly trips taken. It should be pointed out that the replenishment method is important, given that there are differences according to PUSH or PULL. If the PUSH method is used, the supplier manages deliveries and takes to the hospital the product that the supplier deems necessary or appropriate to deliver. It is not a highly recommendable method for managing stores and leaves management in hands of the supplier. Conversely, the PULL method means that supplies are sent on demand from the hospital and that only the number of units consumed and/or agreed on as an order point are replenished. These PULL supplies can be ordered manually by the hospital's logistics staff or using digital stock management tools by automatic order points, with the detection of consumption in real time.
- Storage cost: it is the opportunity cost associated with investing storage space in a product in inventory. This cost is linked to the maintenance costs of storage areas (shelves, cleaning, consumption, etc.).

- Inventory costs: the operating costs of holding excess inventory. A standard cost of 2% of the annual purchasing cost is assumed (this cost can be attributed due to expiry, product or package breakage, internally lost boxes of product, etc.).
- Replenishment costs: cost of the staff engaged in moving product between storage areas (main warehouse, intermediate stores within the unit, supply shelves or dispensing machines). This staff can be internal hospital staff, can be subcontracted from the logistics management company or can be employed by the supplier.
- Waste management cost: even though sutures represent a negligible volume and are not considered biological waste, they are considered sanitary waste and managing the collection and elimination thereof forms a part of the complete logistics process. Every hospital establishes its surgical waste management system. In this study on sutures, this cost is insignificant.

As stated, if the costs are only assessed by direct estimate, a major deviation from the final cost by the hospital and the logistics supplier would be detected.

In the case of a logistics process such as the one under study (Figure 2), observation and analysis should begin with the dispersion that could exist regarding the locations of materials, given that they could be located at various points (main warehouse, storage of the surgical unit, operating theatre cabinets, carts distributed throughout the unit), often with reference numbers repeated by suppliers and with various frequencies of purchasing rotation related to surgical use.

It is therefore essential to transfer this dispersion of material towards a standardization of use of sutures that rationalizes the product catalogue, in addition to standardization of the preparation process for surgery. All this provides an overall analysis of the logistics process so that improvement actions with a high impact on financial management of the surgical unit can be taken.

The Logistics Process is one of the 3 key flows for management of the Surgical Process. By definition, the surgical process is conditioned mainly by the patient flow, which determines the pace and the activity to be performed. Based on inclusion in the Surgery Wait List (abbreviated as "LEQ" in Spanish), hospitals know the volume of activity they will have in the upcoming weeks.

Based on the patient flow, the communication flow between the hospital and the patient is defined so that a surgery effectively takes place, and at the same time, the logistics flow is set up, which will ensure that the materials required for the surgery will be prepared at the right time and with the required quantity [23].

Mapping the activity and the 3 flows (patient, communication and materials) allows initiating a process of standardizing the allocation of materials that are necessary for each procedure. This would allow, based on the confirmed surgery schedule, early preparation of the required materials, and it would facilitate assigning all the products used to the patient.

Discussion

After having analyzed the suture consumption data of the surgical unit, the large annual volume represented by units of sutures is detected, as well as the impact thereof on purchasing management. Moreover, 97% of sutures are concentrated in just a few, but large, suppliers.

There is also major potential for improvement in resolving product duplicities and overconsumption due to inefficiencies in the replenishment and storage process.

After analyzing the current situation of the process and from the point of view of optimization and seeking operational excellence, a target situation can be determined based on implementing a series of potential improvement actions according to 4 main lines. The following figure shows a subjective proposal of the current situation and of the potential situation that could be reached by the logistics process of Sutures at any hospital (Figure 3).

These improvement opportunities have been classified into 3 main areas of work corresponding to the logistics flow in question: rationalization of the consumption and use of duplicated products for the same surgery, standardization of the consumption points and a cost analysis to define the best relationship between stock in inventory and the frequency of replenishment orders.

Actions related to the current process

Based on the study conducted, 3 major actions related to the current logistics process of hospitals are proposed.

The **first** major action consists in **rationalizing the use of sutures** and **reducing the variability** in product selection to prevent overconsumption and to adapt the purchasing catalogue in order to standardize needs according to the surgical activity of the hospital and the types of procedures, thereby eliminating the duplicities that exist between products from different suppliers that have the same characteristics.

The catalogues of hospitals are fairly uniform regarding duplicated materials (around 20%). However, an increase that is proportional to the size of a hospital is observed, as well as to the volume of healthcare activity and to the level of surgical specialization.

The material purchasing process also has an influence: whether or not it takes place through public tender, which is always more restrictive.

In one of the hospitals, the study shows that, of the total of 237,780 units of sutures consumed during 2021, a total of 4,130 purchase orders were required. Moreover, overconsumption of approximately 11% over the ideal theoretical consumption was detected, based on the number of annual surgeries performed.

The study has shown the great potential for optimizing the currently available product catalogue, given that there is duplicity of 18% with respect to sutures that have the same characteristics, but from different suppliers. Having a percentage of duplicities in product references means an over-stock of product, including the unnecessary cost of managing replenishments and the occupation of space in a warehouse and in the Surgical Unit.

To resolve this impact and reduce the volume of product references, a single, generic allocation of product needs must be standardized and agreed on. This decision must be made by the surgical teams, therefore attempting to reach an agreement among surgeons of the same procedures regarding the best product for each need, thereby contributing to the improvement of clinical practice.

Second, product references must be **placed in the proper locations**. In the current situation, it is common to find both official locations and various, “unofficial” locations that are found in some operating theatres, above all those that are used extensively, or a product in question is more specific according to the type of surgery.

In this case, the proposal is for sutures to be included within the same management circuit concept as all other standardized products, with daily replenishment from the warehouse by the supplier, without any direct need by nursing to control the stocks. The idea is to standardize the replenishment of sutures just like any other highly consumed product, therefore using the double drawer of each cart in every surgery unit and Kanban cards. The double drawer has an initial impact on consumption because it can slightly increase the stock, but it more effectively decreases the management time and the impact on back orders of suppliers.

Apart from the proposal to use the operating theatre carts for sutures as well, after having had agreed on the most common needs and having added any special needs to specific carts, we would propose that the model evolve towards proposed unit consumptions attributable to a procedure based on dispensers per module. This proposal requires considerable standardization of sutures per procedure and sufficient advance preparation so that the pace of work of an operating theatre is not affected.

The third action proposes analyzing the costs of the logistics process and eliminating or at least reducing everything that does not contribute value to the system of preparing materials for surgery or to the logistics of replenishment.

3 cost study concepts for sutures have been designed:

1. By theoretical estimate of suture consumption based on surgical activity.
2. By real estimate based on direct purchases of the product throughout one year.
3. By estimate of the hidden costs of the logistics process added to the purchase cost.

In the case of the theoretical estimate according to surgical activity, based on the cost of the product, the theoretical amount of the necessary sutures can be estimated by calculating the number of active operating theatres per day at the hospital, by the number of surgeries planned per day and by the average number of sutures required per surgery, together with use per work shift and the working days per year in order to calculate the total annual consumption.

As an example, a large tertiary hospital could represent a theoretical annual volume of close to 180,000 units, with an annual cost of approximately €480,000/year. This exercise does not contribute major value to the process of the purchasing decision or to a comparison between purchasing and/or replenishment processes, given that it does not take into account either the hidden costs of the logistics process or time considerations for management. In this case, the VSC must be analyzed to determine the set of costs involved in each process as a whole and the part assumed by the supplier and the hospital in a complete annual cycle.

Before conducting the cost analysis, and initially based on real data regarding purchases of units of sutures, in this case the following can be verified: 203,300 units were consumed in the surgical unit, and comparing this figure with the theoretical data based on surgical activity, overconsumption of 11% between expected consumption and real consumption is detected. This overconsumption represents annual waste of €61,600 euros for the hospital, before conducting the study on hidden costs throughout the process.

It is therefore necessary to conduct and evaluate the cost study based on VSC, which analyses the various concepts of the cost generation arrow (Figure 4).

Following this cost analysis dynamic, the study of the logistics process of this hospital represents a total of over €567,000 each year (counting the acquisition cost). But of these costs, waste represents 11%, squandered mainly due to overconsumption because of poor management, lost material or expiry, with the remainder due to the low-value time of professionals invested in logistics management.

If, at the same time as the aforementioned hidden costs of suture overconsumption, we take into account the purchasing and storage costs, the total cost to be added to purchase of the product represents an increase of over €86,000 per year.

If the surgical teams reach an agreement on the most appropriate, efficient and beneficial type of sutures for improving clinical practice, it will be possible to not only optimize the use of the required sutures but also reduce the purchasing volume of the various product references, which will translate into a decrease in costs per order.

Conclusions

Therefore, the study on the logistics process of sutures at the hospital in question reveals that there is a major cost overrun in the operating process, which directly affects the efficiency of the surgical process, something that is repeated in the vast majority of hospitals. The current cost of the operating process represents a cost overrun of €86,000 for the hospital, with a large part of this overrun attributable to the detected 11% overconsumption based on the estimated cost for a hospital of similar size.

However, the study also identifies a series of actions that can significantly improve the efficiency of the surgical process and reduce the operating costs of hospitals. One of these actions consists in standardizing the selection of sutures as a consequence of standardizing the clinical procedures, which would reduce the storage space of sutures on carts by eliminating 20% of the duplicities.

Moreover, if the stock of the selected product references is increased, then the replenishment point can be increased, which would allow reducing replenishments and, therefore, both the cost of an order per purchase line and the management by staff for replenishing and restocking sutures.

Adopting these measures could generate major operational savings per year for hospitals as a whole. The reduction due to improvement of the Operating Process (75% in overconsumption and 50% in purchase lines) could, for this hospital example, represent a savings of €49,300 in the first year, while the reduction due to improvement of the Operating Process (50% in replenishment cost, 50% in space and 50% in excess inventory) could represent an operating savings of €17,400 every year.

Consequently, implementing these actions would considerably offset the cost of the investment in standardization work by surgical teams. In fact, the economic impact of these measures is greater than the costs of such investment, which suggests that adopting these strategies is a viable and profitable option for improving the efficiency of the surgical process at hospitals. Moreover, these findings can be extrapolated to other materials that take part in the surgical process as a whole (sutures represent only 1% of the costs of a Surgical Unit), which could represent major financial savings for a hospital and improve the quality of patient care.

As conclusions to the study, it is confirmed that the surgical unit of a hospital represents a major financial cost, and it is an inexhaustible source of possible efficiencies: this case is just one example. The optimization of logistics processes and efficiency in stock management generate operational savings and improved preparation times for surgery. The standardization of materials also helps to improve clinical practice, which has an impact on the safety and the health outcomes of patients.

The methodology that has been followed is applicable to any improvement project at a hospital, and the benefits obtained in these projects are always far greater than the cost of the investment. We must be able to leave room for professionals and provide them with training on the culture of improvement so that, in the medium term, it forms a part of a hospital's routine.

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