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Interest of the « Adress-Position Code » and the « Internal Customer-Supplier System » in Hospital Pharmacy Stock Management

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Abstract

Despite the undeniable contribution of the computerized inventory management in hospital pharmacy and the increasing performance of storage facilities, the practice has revealed several shortcomings and difficulties in terms of stock management. The aim of this work is to suggest two organizational approaches that result from a long experience over five phases, which benefited from the commitment of our hospital top management. It's about the Address-Position Code (APC) and the Internal Customer-Supplier System (ICSS). These two approaches allow us optimizing stock management and securing pharmaceutical products while improving their availability for the benefit of their users. Thus, they could be applicable in other similar structures to master pharmaceutical products flow and stock management.

Keywords: Address-Position Code, Internal Customer-Supplier System, stock management, computerized management, pharmaceutical products, hospital pharmacy.

INTRODUCTION

Despite the undeniable contributions of computerized inventory management in hospital pharmacies and increasingly efficient storage facilities, practice has made it possible to identify several shortcomings and difficulties in mastering this management. Over-stocking, expiration losses and stock-outs are part of the daily life of hospitals.

The provision of high-performance tools should be accompanied by a practical organization, making it possible to perfect the inventory management process.

Efficiency in the stocks management of pharmaceutical products presupposes a mastery of qualitative and quantitative needs, which would make it possible to have the right drug for the right patient at the right time and at the best possible cost for both patient and hospital [1]. The imperatives of availability, quality and safety, deadlines and costs must then be taken into consideration.

In terms of availability, the categorization of pharmaceutical products into life-saving, essential and non-essential products as well as the distinction between hospital products and ambulatory use products are all approaches that make it possible to reduce the number of managed products to a strict minimum and therefore to contribute to the stock management mastery in hospitals. The control of the periodic consumption (daily, weekly, monthly, etc.), the needs expression by care units and the prioritization rules such as PARETO law make it possible to control the quantitative aspects and therefore to decide on the quantities to be put in stock. These approaches would make it possible to avoid losses due to expiry [2], stock-outs, dead stocks (products with zero consumption that do not qualitatively correspond to the real need) and slow stocks (products with consumption lower than expected that do not quantitatively correspond to the real need).

In terms of quality and safety, despite the efforts and the organization to control the quality of pharmaceutical products during their acquisition (preparation of specifications, conformity analysis, etc.), this quality can be altered in case of poor storage or poor stock access management, thus exposing, among other things, to the risks of degraded products use or medication errors.

In terms of lead times, the time needed to access the pharmaceutical products and make them available to patients or care units within the set time limits can be negatively impacted in the case of poorly stored product or nonstored product due to the lack of forecast or to a default or a delay in ordering or delivery. The consequences can seriously compromise the patients therapeutic management quality. As a result, mastering stock-out alerts, organization and rules for storing and tracking pharmaceutical products are decisive for the quality of stock management.

In terms of costs, stocks management generates costs of several kinds [3]. On the one hand, we find the basic costs corresponding to the unavoidable costs, including the costs of holding stocks and placing orders, and on the other hand those that can be described as additional costs, corresponding to the avoidable losses generated first by repetitive orders in deviation from the optimal orders number that make it possible to equalize the placing cost and the holding cost, and then by the loss of profit that could be possible through the purchase of large quantities (economy of scale), not to mention the additional consumption induced by complementary or substitute therapies necessary for possible complications management. The latter are often due to a delay in therapeutic management secondary to a stock shortage or dispensing delay.

By properly organizing stocks in pharmaceutical products circuit at hospitals and improving the patient care quality, significant savings could be made and many budgetary losses can be avoided [4].

The objective of our work is to propose two organizational approaches that we have experienced in our hospital and which can contribute to the stock management mastery. These are the “Address-Position Code” (APC) and the “Internal Customer-Supplier System” (ICSS).

MATERIAL AND METHODS

This experience, which benefited from our top management’s commitment, took place in five phases:

Phase 1: first APC trial at in vitro diagnostic medical devices department of Mohammed V Military Teaching Hospital (MVMTH) in Rabat (Morocco).

Phase 2: ICSS implementation at in vitro diagnostic medical devices department of MVMTH and start of reflection and preparation of APC implementation at the other pharmacy departments (drugs department and medical devices department).

At the end of these two phases, the first experiences enabled us to identify in practice the strengths and weaknesses of these two organizational approaches and to identify improvement areas.

Phase 3: adoption of the APC as a secondary reference for pharmaceutical products identification and tracking at the three MVMTH pharmacy departments.

Phase 4: a period coinciding with the reorganization of the MVMTH pharmaceutical departments and which was devoted to reengineering the pharmacy pole management processes and to a systematic survey of initial data relating to the stock management indicators.

Phase 5: APC computerization and implementation as the main reference for pharmaceutical products identification and tracking and setting up the ICSS as an organization of stock management, with main depots as "internal suppliers" and distribution stores as "internal customers" which are independent. The APC and ICSS logics have thus been integrated into the stock management IT solution.

RESULTS AND DISCUSSION

The two organizational models that we have proposed are the following:

1. The Address-Position Code (APC)

The standard storage warehouse layout includes a number of rows (R), which are made up of columns (C). Each column includes a certain number of shelves (S) and on each shelf you can define several positions (P).

a. Identification of storage positions:

The storage positions identification is based on the definition of a code in following format: Rx.Cy.Sz.Pt, where x, y, z and t indices designate the presentation order of rows, columns, shelves and positions occupied by the stored products.

Example: Either the following position address: R1C3S2P1

This is a product that is in the first row, in the third column and on the second shelf where it occupies the first position.

By convention, the selected numbering directions are as follows (Figure 1):

- From left to right, for rows, columns and positions;
- From bottom to top for shelves.

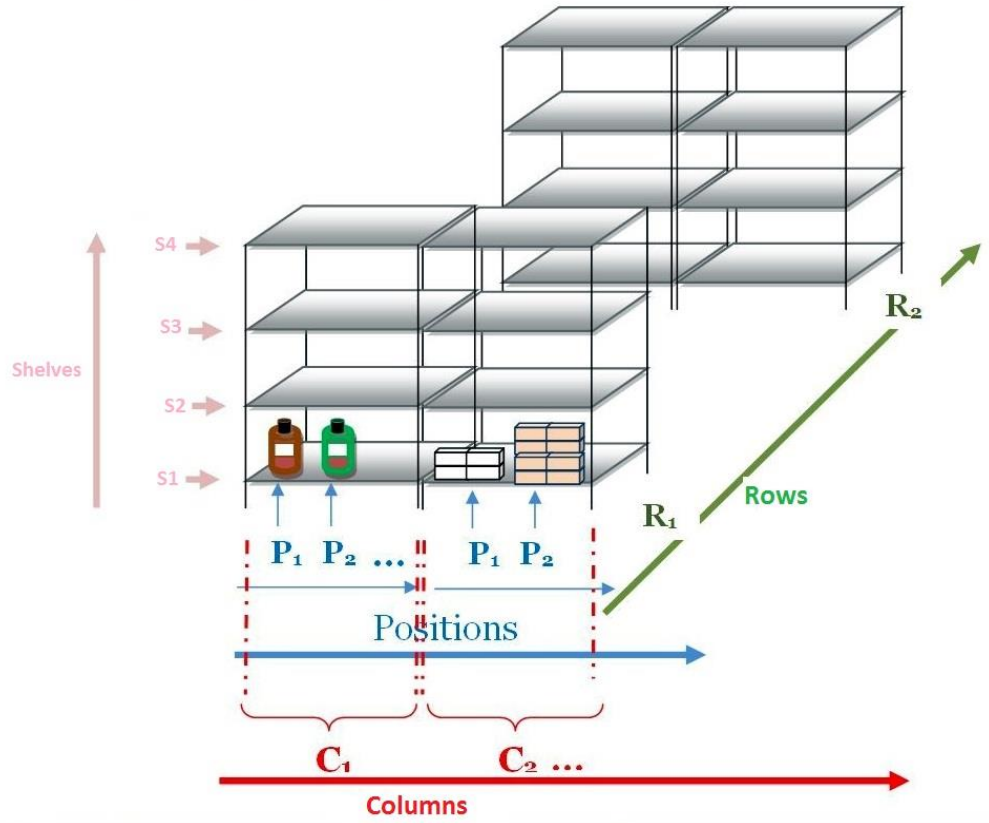

Figure 1: APC numbering directions

b. Rules for assigning codes

Two variants of APC code are possible: the fixed APC code and the variable APC code.

- *Fixed CAP code:*

The same product is always stored in the same position, and will keep its APC code permanently. This solution has the advantage of great simplicity in allocating codes and their computerized management (the entry of a code will be done only once when acquiring a new product). However, it has the disadvantage of not making it possible to exploit the free positions that could be left by products temporarily absent or in reduced quantities compared to those usually held.

When receiving a product already in stock, if it has a different expiry date, it will have a new APC code and will be considered as a different product. The geographical remoteness of two batches of the same product having two different expiry dates makes it possible to better manage expiry dates during dispensations. The computer system, having adopted the APC logic, will provide when distributing products, in addition to the product designation, the APC code of the product whose expiry date is closest.

- *Variable APC code:*

The same product can be stored in different positions and several codes are then assigned to it even if it is the same batch. This variant has the advantage of making it possible to use the maximum number of available positions and to prevent the difficulties encountered when receiving quantities which volume is greater than that provided for the position initially dedicated to the product. The tedious APC computerized codes management represents the main drawback of this variable approach, given that the allocation and entry of APC codes will have to be done each time the product is received.

2. The Internal Customer-Supplier System (ICSS)

The traditional reception-distribution management diagram within our hospital is shown in Figure 2. This model generates several management constraints and exposes hospital pharmacies, on the one hand to the vagaries of supply irregularities (stockouts at the external supplier, delivery delays, etc.) and on the other hand to the consequences of consumption rates variation (unconsumed products expiry or rupture due to overconsumption).

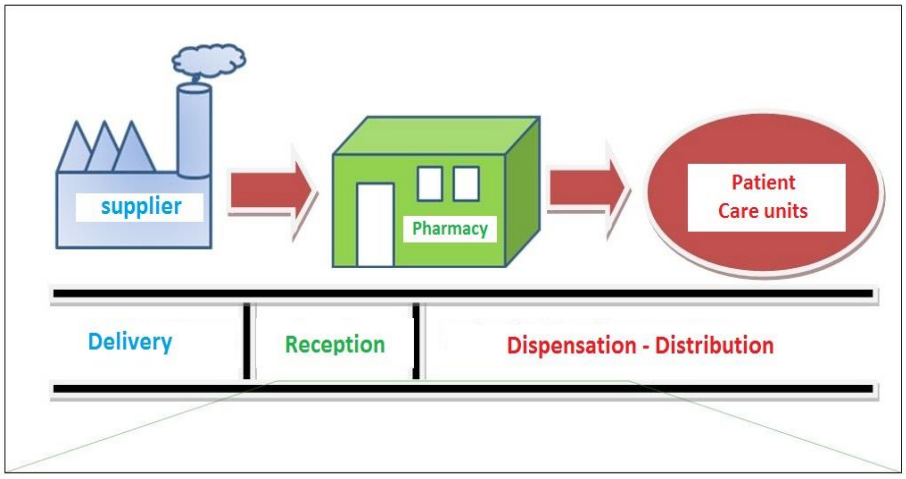

Figure 2: Traditional hospital reception-distribution management diagram

In terms of entries and exits control, the rhythm is often irregular and the stocks states vary considerably over time. Inventories are often difficult to perform due to the need to temporarily stop stock movements during the inventory period.

The ICSS that we present is built on an organizational model which consists of individualizing the main depot and the distribution store. The reception-distribution management scheme according to this system is shown in Figure 3.

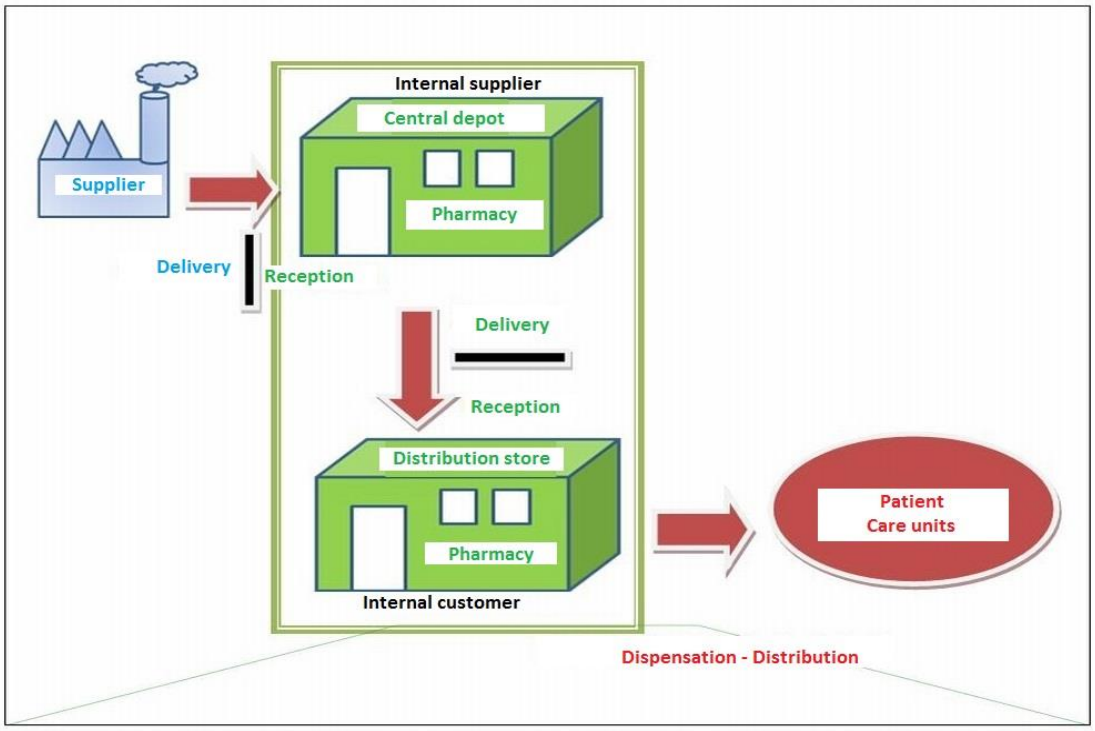

Figure 3: ICSS hospital reception-distribution management scheme

This organization allows individualized management of the central pharmacy depot, which is likened to an "internal supplier" and which supplies the distribution store according to a "supplier-customer" logic. Indeed, the distribution store triggers its periodic orders according to the products consumption and the predefined replenishment thresholds. It sends a replenishment request (equivalent to an order form) to the central depot (internal supplier) and the quantities granted by the head of the main depot appear opposite the quantities requested on an edited document (equivalent to a delivery note). This will serve as an acknowledgment of receipt.

The advantages of such an approach are:

- Better management of shortages risk as the quantities delivered during replenishment can trigger an order if the alert thresholds are reached. In addition, the distribution store continues to deliver patients and care units during the external

supplier delivery times, and for more guarantee, the main depot also has a safety stock so as not to feel delays in delivery at products use points;

- Better expirations control via additional control during the replenishment stage;
- Better control of products quality thanks to multiple controls of their conformity. In fact, checks are possible upon receipt from the external supplier, when restocking the distribution store and during dispensing to patients or distribution to care units;
- Better control of product flows and ease of inventory. Indeed, even if the managed quantities at the main depot are very large, the products movements being carried out only towards the distribution store and with a reduced frequency, remain easily controllable. Inventories are possible at any time because they do not require stopping movements. Regarding the distribution store, despite the high frequency of outings to patients and care units, the quantities held in stock are reduced and their inventory is quick and does not require a stoppage of activity for a long period.

In order to optimize the performance of this stock management model, an IT system built on the same logic must be put in place and must meet the following criteria:

- The stock entry at the central warehouse is made after validation of the entry slip by the storekeeper in charge;
- Product orders for the distribution store are made electronically;
- The central warehouse manager (internal supplier) electronically agrees the quantities to be supplied to his client (distribution store);
- Acceptance by the internal customer consists of comparing the quantities granted with the physical quantities delivered by the internal supplier (central warehouse);
- The signature of the receipt report allows the transaction electronic validation and therefore automatically deducts the quantities granted from the stock of the central depot and systematically adds it to the distribution store stock.

CONCLUSION

The maturity of management processes integrating the APC and the ICSS is the result of numerous experiments carried out by pharmaceutical teams committed to optimizing their activities. These approaches enabled us to implement an optimized solution at the level of the various departments of our hospital pharmacy pole and thus to obtain satisfactory results in terms of stock management performance indicators. In addition, this organization allowed us to obtain a better traceability of the operations carried out within the framework of the pharmaceutical products management cycle in our hospital. Computerization of pharmacy management integrating APC and ICSS approaches would improve management processes and simplify their execution in similar structures. Finally, it is not a question in this work of questioning the basic rules of inventory management, but of providing an organizational approach which could contribute to the optimization of this management and to the reduction of non-conformities risk.

REFERENCES

1. Marais, N., Beuzit, K., & Faucher–Grassin, J. (2005). Logistique des approvisionnements et assurance qualité. *Actualités Pharmaceutiques Hospitalières*, 4, 43-45.
2. Ministère de la santé, des affaires sociales et de la famille / direction générale de la santé - République démocratique du Congo, 2008, Manuel de Gestion des médicaments dans les pharmacies des circonscriptions socio-sanitaires, World Health Organisation.
3. Julien, N. (2009). Gestion de stock. *Actualités Pharmaceutiques*, 484, 41-43.
4. Alfidja-Cisse, A. (2003). Guide pharmaceutique PSF-CI: Comment mieux gérer les entrepôts pharmaceutiques, Pharmaciens Sans Frontières-Comité International.