

Digitalizing the Pharmaceutical Logistics in Healthcare Units: The Case of a Public Hospital

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Abstract: The Ministry of Health and Social Protection (MHSP), aware of the crucial importance of the pharmaceutical logistics in healthcare departments in securing the drugs circuit in hospitals, has opted, as part of the health system modernization program, for the acquisition and installation of new automated and secure stations for the distribution of medicines and medical devices in the healthcare departments of the SEGMA public hospitals. For the sake of our analysis, we used the « 5M » method (or Ishikawa diagram) with the aim of: (i) evaluating the contributing factors capable of ensuring the smooth operation of these stations; (ii) identifying strengths for optimizing the management of supplies at the department level; and (iii) proposing appropriate solutions to overcome the critical points necessary for improving the storage and traceability conditions for medicines and medical devices at the level of healthcare departments. The results of our study support the arguments in favor of digitizing pharmaceutical logistics in public hospitals, but also highlight the points that need to be improved in order to make the hospital drug circuit more secure.

1 INTRODUCTION

Optimizing the logistical cycle of a hospital pharmacy is a major concern when it comes to rationalizing expenditure. And the pharmaceutical logistics of healthcare departments constitute a crucial phase in securing the hospital drug circuit.

To achieve this main objective of improving the safety of the drugs circuit in public hospitals, the Ministry of Health and Social Protection (MHSP) has opted, as part of the program to modernize health systems, in particular through the construction of new hospital structures, for the acquisition and installation of new automated and secure stations for the distribution of medication and medical devices in healthcare units of public hospital SEGMA.

The specific objectives set for this study are as follows: (i) to assess the factors contributing to the smooth operation of these stations; (ii) to identify strengths for optimizing the management of supplies at the level of departments; and (iii) to propose solutions for overcoming the critical points needed to improve the storage and traceability conditions for medicines and medical devices at department level.

2 MATERIALS AND METHODS

The MHSP has equipped the public hospital SEGMA with five automated and secure stations for the distribution of medicines and medical devices, which it has installed in the pilot units identified in agreement with the hospital's management: central operating room, intensive care unit, maternity unit, medicine unit and trauma unit.

Each station consists of the following four components: a) modular main station with 6 different drawers classified according to their level of access security (matrices, cubies and mini-drawers), and equipped with a touch screen, a keyboard, a printer, a barcode scanner and a biometric user identification window; b) two auxiliary cabinets with 7 drawers; c) two auxiliary cabinets with double glass doors; d) a secure locking key for the refrigerator fitted with a probe for continuously recording the temperature inside the chamber. All five stations are connected to a central server located in the hospital's biomedical maintenance office and controlled by a computer in the hospital's pharmacy department.

For the sake of our analysis, we used the « 5M » method (or Ishikawa diagram) to assess the potential

causes of problems, in order to propose a method for resolving them.

3 RESULTS

The analysis of the factors contributing to the smooth operation of these stations in healthcare departments, using the « 5M » method, enabled us to identify the main causes that are holding back the commissioning and operation of these stations by health professionals. At the end of this analysis, we were able to propose concrete solutions to ensure the operation of these new stations in healthcare departments.

The results of this analysis are summarized in the table below.

Table 1.

Dimension (5M)	Constraints encountered	Proposed solutions
Material	<ul style="list-style-type: none"> -The standard configuration of the components of each station does not take into account the management particularities of each type of healthcare department -The expiry of the warranty on the stations and the server, as well as the expiry of the antivirus and Office operating licenses, deactivates certain system functions 	<ul style="list-style-type: none"> -Redeploy certain station components between the concerned departments to ensure their optimal use -Schedule the launch of the maintenance contract (EMD¹) and the acquisition of software licenses (IMD²)
Milieu (Environment)	<ul style="list-style-type: none"> -The size of the station is not adapted to the surface area of the department's "pharmacy" room -The air conditioning in the server room is not powerful enough to 	<ul style="list-style-type: none"> -Install the stations in spacious premises equipped with functional intranet sockets (e.g. treatment room) -Replace the existing air conditioning unit with a second, more powerful

	<p>ensure continuous operation of the central server</p> <p>-Frequent interruptions to the intranet connection between the central server and the stations, via the intermediate cabinet on the floors, have a negative impact on the optimal operation of the stations</p> <p>-The difficulty of interfacing between the central server of the stations and the hospital's other software (RAS³ and SGMPS-V1) means that patient identifiers have to be transcribed manually by healthcare personnel</p>	<p>unit capable of ensuring continuous operation of the servers</p> <p>-Invite the service provider to reconfigure the intranet network connection and the wall sockets between the central server and the stations.</p> <p>-Unsolved Problem !</p>
Matter	<p>-The dimensions of certain bulky medicines and medical devices (e.g. massive fluid vials) are not adapted to those of the station's drawers.</p> <p>-The difficulty of managing products delivered in kits to the stations</p>	<p>-Keep the management of these products outside the stations pending the acquisition of stations with suitable configurations and dimensions</p> <p>-Include the composition of the kits used in the station database</p>
Methods	<p>-Loading (replenishing) the stations is an extra workload for healthcare personnel</p>	<p>-Reinforce the pharmaceutical team with a person who will be in charge of the logistics of the floors/ departments.</p>
Manpower	<p>-Lack of ownership /adherence by the pharmaceutical and</p>	<p>-Designate a focal point to provide ongoing support for the</p>

	care teams to the use of the stations -Reluctance on the part of some healthcare personnel to use biometric identification (fingerprint) on the stations	training of pharmaceutical and healthcare teams -Opt for access by digital code or badge to ensure that the healthcare personnel can handle the stations
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1-Equipment and Maintenance Directorate
2- IT and Methods Division
3-Reception and Admissions Service

4 DISCUSSION AND CONCLUSION

Digitizing the pharmaceutical logistics of the hospital's departments has made it possible to: (i) secure and rationalize the movement of medicines, in particular by restricting access to the station to authorized operators only; (ii) improve stock-keeping in the departments, in compliance with the storage conditions recommended by the manufacturers; (iii) simplify the management of supplies to the departments, through the adoption of the full-empty replenishment system by the hospital pharmacy; (iv) improve the traceability of medicines in the department, through the systematic recording of all operations carried out at the station; (v) ensure continuous and regular monitoring of the temperature inside the refrigerator to guarantee better safety and quality of thermolabile medicines in healthcare departments.

Despite all these strong points in favor of digitizing the department's pharmacy, much remains to be done to improve the operation of these automated and secure stations, in particular through : a) providing ongoing, regular support for the change management process for the various professionals involved (pharmacists, pharmacy assistants, nurses, doctors, etc.), in order to increase their confidence in the system ; b) providing healthcare department managers (senior doctors and senior nurses) with an interface for steering and monitoring movements on the department's station, including the possibility of using these stations to produce dashboards of nominative consumption; c) freeing up nurses' time by lightening their workload, by transferring the task of loading the stations to qualified support staff authorized by the pharmacy, and by providing ongoing and regular training for all the department's

healthcare personnel in the safe and easy handling of the stations; and d) full interoperability with the hospital information system to ensure better integration into the patient file.

In conclusion, the digitization of pharmaceutical logistics in public hospitals represents an essential opportunity to improve the safety of the hospital drug circuit. This requires a very detailed study of the project to ensure the best return on this investment.

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