Contemporary Issue

Improving medical stores management through automation and effective communication

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ABSTRACT

Background: Medical stores management in hospitals is a tedious and time consuming chore with limited resources tasked for the purpose and poor penetration of Information Technology. The process of automation is slow paced due to various inherent factors and is being challenged by the increasing inventory loads and escalating budgets for procurement of drugs.

Methods: We carried out an indepth case study at the Medical Stores of a tertiary care health care facility. An iterative six step Quality Improvement (QI) process was implemented based on the Plan–Do–Study–Act (PDSA) cycle. The QI process was modified as per requirement to fit the medical stores management model. The results were evaluated after six months.

Results: After the implementation of QI process, 55 drugs of the medical store inventory which had expired since 2009 onwards were replaced with fresh stock by the suppliers as a result of effective communication through upgraded database management. Various pending audit objections were dropped due to the streamlined documentation and processes. Inventory management improved drastically due to automation, with disposal orders being initiated four months prior to the expiry of drugs and correct demands being generated two months prior to depletion of stocks. The monthly expense summary of drugs was now being done within ten days of the closing month.

Conclusion: Improving communication systems within the hospital with vendor database management and reaching out to clinicians is important. Automation of inventory management requires to be simple and user-friendly, utilizing existing hardware. Physical stores monitoring is indispensable, especially due to the scattered nature of stores. Staff training and standardized documentation protocols are the other keystones for optimal medical store management.

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Introduction

Medical services are an important part of the logistic support system of the Armed Forces of any country, during times of peace, war and also during operations other than war (OOTW). It will be appreciated that comprehensive healthcare cannot be provided realistically without professional management of medical stores, which include but are not limited to the armamentarium of pharmaceuticals and expendable and non expandable items of medical use. Thus, this is a crucial component of any organized medical services be it in the military or civilian sector. The effectiveness and efficiency of healthcare delivery in a hospital setting depends on the smooth and proper functioning of the medical stores department.[1]

The major components of medical stores management are inventory and warehouse management. For healthcare managers, monitoring of performance is essential and ground realities dictate that effective communication within the hospital hierarchy and system should be an integral part of logistics management initiatives.

In Armed Forces hospitals, especially those still located in vintage buildings, there may sometimes be a lack of proper infrastructure for medical stores. Often there may be a shortage of qualified pharmacists relative to the workload due to various organizational constraints, such as field and operational deployments besides training capacity limitations. There is also an additional load due to the increasing numbers of military veterans and their dependents, from the Ex Serviceman Contributory Health Scheme (ECHS).

The peculiar requirements of patient care often dictate the provisioning of 'short shelf life' life saving items at short notice. The various contingencies that medical care of a spectrum of patients and illnesses cannot be provisioned for in advance in some situations. The financial and procurement provisions of the Govt may at times also pose an impediment especially in case of emergent purchases of life saving drugs.

Therefore it is very important to have simple yet stringent medical stores management techniques to cope up with the various challenges that provisioning of healthcare is fraught with. The aim of such management is thus, to protect stored items from loss, damage, theft or wastage and to manage reliable movement of supplies from source to user in the most economical and expeditious way.

During an internal audit at a tertiary care hospital, it was found that expired medicines were not being replaced by the vendors as per contractual requirement, thereby blocking funds expended. The aim of our study, was to look into the causes leading to expiry of large numbers of medicines and devise a system for effective medical store management in resource constrained settings.

Materials and methods

The case study methodology[2] is being utilized in this paper to present our approach. The setting is that of a tertiary level healthcare center of the Indian Armed Forces. An iterative six step Quality Improvement (QI) process based on the well established Plan–Do–Study–Act (PDSA) cycle[3] (Fig. 1) was implemented in Sep 2013 and the situation was re-evaluated at predefined intervals. The six steps were modified to fit into effecting improvement in medical stores management. The six step problem solving discipline approach[4] is depicted in Fig. 2.

Step 1: **Defining the problem**: We went through the list of expired drugs in the medical stores and found a large number of drugs lying expired from 2009 onwards. We then prepared a data sheet of these drugs as per date of expiry; details of vendors/dealers or manufacturer, supply order number, quantity purchased and quantity expired. We also found out that the supplying vendors had been intimated of the expiry, but there was no record of any return communication from the vendors. In many cases the expired quantity was more than 50% of the supplied quantity of the medicine. We updated the list of expired drugs from the ledgers after confirming the ground and ledger balance. Certain medicines which were slow moving and nearing their expiry with a high stock position were listed separately.

Step 2: **Identify all possible causes and confirming data gathered in Step 1**: We confirmed the accuracy of data from the ledgers and through a physical verification of stock position. After confirmation and updating the data we prepared a cause and effect diagram to ascertain all possible causes for the expiry of the drugs as depicted in Fig. 3. Based on the cause and effect diagram we could determine reasons for the issues with inventory management leading to expiry of medicines. This allows planners to prioritize and focus on areas for improvement.

Step 3: **Developing the action plan**: After consultative efforts based on the cause and effect diagram and its analysis we prepared an action plan and an action chart was finalized (Fig. 4). The data management system was
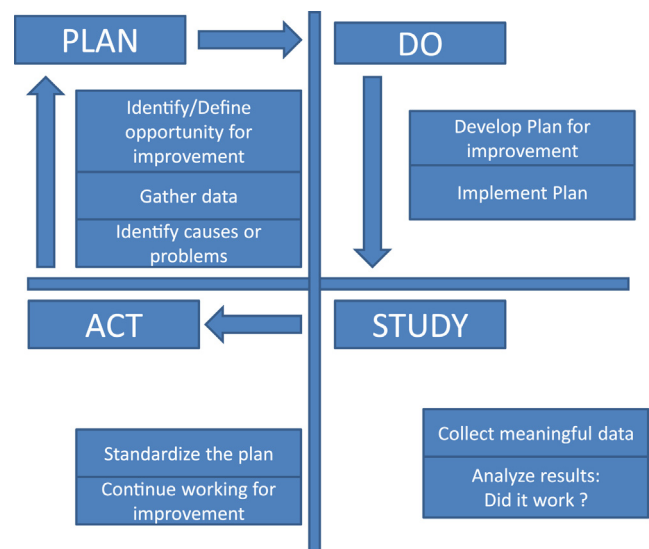

Fig. 1 – Plan–Do–Study–Act cycle.