CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

https://zenodo.org/records/10694174

https://www.iajps.com/volumes/volume11-january-2024/68-issue-01-january-24/

Available online at: http://www.iajps.com *Review Article*

A STUDY ON INVENTORY CONTROL AND DRUG STORE MANAGEMENT

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Abstract:

A drug Store/Pharmacy/Community Pharmacy/chemist's is a retail shop which provides prescription drugs, among other products. At the drug store, a pharmacist oversees the fulfilment of medical prescriptions and is available to give advice on their offerings of over the-counter drugs. The basic purpose of purchases is to ensure continuous flow of raw materials of right quality, right quantity, and right price and from right sources. Another objective of purchasing the avoidance of duplication and wastage with respect to various items purchased.

Drug store management is based on principles of inventory control. There are different Techniques of Inventory control methods such as ABC analysis, VED analysis, EOQ, Lead time Buffer stock FIFO, FEFO, FSN analysis, SOS analysis, XYZ analysis. The use of computers minimizes the chances of validity of drugs expiring while in storage by the transfer of stocks from the surplus to deficit depots and with advantages such as less investment, less storage, Fast supply of drug, Control on Issue of Drugs, Minimum wastage and Prompt payments.

Keywords: *Inventory control, ABC analysis, Lead time elderly.*

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Please cite this article in press E. Swapna et al., ***A Study On Inventory Control And Drug Store Management****, Indo Am. J. P. Sci, 2024; 11 (01).*

1. INTRODUCTION:

DRUG STORE

A drug Store/Pharmacy/Community Pharmacy/chemist's is a retail shop which provides prescription drugs, among other products. At the drug store, a pharmacist oversees the fulfillment of medical prescriptions and is available to give advice on their offerings of over the-counter drugs. A typical pharmacy would be in the commercial area of a community. Every hospital should have a medical store for the purpose of procuring, stocking, and distributing the drugs and medicines to various departments.

2. ORGANISATION OF DRUG STORE

Stores are defined as a sub-organization in any hospitals where materials obtained are held in abeyance till inspected, approved and stocked. A store should have a standard specification of materials and since the store procured the drugs on behalf of the department for regular flow of material, the condition of storage should be proper.

OBJECTIVES OF DRUG STORE

1. To stock all drugs and accessories required in the hospital.
2. To procure drugs from different sources.
3. To supply drugs to the consuming departments.
4. To store drugs required in research work.
5. To preserve records of receipt and issue of drugs.
6. To maintain records of receipt and issue of drugs.
7. To carry out all operations regarding drugs economically to save revenue.

FEATURES OF GOOD LAYOUT DESIGN

- Proper ventilation.
- Proper illumination
- It must be located on ground floor, close to pharmacy.
- It must have 2 entries, one for receiving and other for issuing materials.
- Walls and roof should be painted with washable paint.
- Sufficient number of wooden or steel racks should be provided.
- Fast moving items should be kept near the counter while slow moving items are kept at back of shelves.
- Bulky items should store at the bottom of shelve.
- Surgical instruments should store in separate racks.
- Cash counter, wrapping counter should be located near entrance.

3. LAYOUT OF DRUG STORE

The drug store should be preferably located on the ground floor close to the pharmacy. An area of at least 600-1000 sq. ft should be allotted to medical stores. Adequate storage facilities should be there so that the drugs, chemicals, biological etc. Do not get deteriorated by moisture or heat. An ideal store should have two entrances, one for receiving the articles and other for issue of materials.

Generally, racks are used for storage of material made of angled iron, having partitions. Costly items are stored in closed bins. The height of racks depends upon the height of ceiling and should be above 2/3 rd. the height.

Since large numbers of products are to be stored in the store, A definite location code is to be followed in order to identify the product or material placed in store. For this purpose, analysis is carried out after studying their inventory like

(a)F S N- Fast moving, slow moving, non-moving

(b)H M L- Heavy, medium, light materials

According to above mentioned categorization, fast moving materials are placed near the issue exit while non-moving articles are placed far from the exit. Similarly heavy items are placed at the bottom and light items on the top.

Now a day's records are maintained using Bin Card system.

4. TYPES OF MATERIALS STOCKED

Sufficient number of racks should be provided for storage of drugs and supplies. Carbon dioxide fire extinguishers should be provided at strategic points along with fire buckets to fight sudden fires due to stored drugs and chemical. Materials which are stocked are listed as under

- Capsules, tablets, liquid dosage form and injections etc.
- Biological antibiotics are stored properly in refrigerator.
- Narcotic and psychotropic substances are stored under lock & key.
- POISOINS are stored in separate closed rack, labelled as" POISION".
- Alcohol and alcohol containing preparations.
- Large bulk items on bottom. Vaccines and other thermo labile drugs are required to be stored at cold store 2- 100 C. Antibiotics, vitamins liver preparations etc should be stored at cool temp (15- 200 C).
- To avoid pilferage costly drugs and prescribed schedule X drugs should be stored separately under lock and key.

STORAGE CONDITIONS

- Cold storage: 2-8^{0}c
- Cool temp: 8-25
- Room temp RT-temp. Temperature prevailing in working area.
- Warm: 30-40oC
- Excessive Heat: Above 40o c

5. PURCHASE AND INVENTORY CONTROL

The basic purpose of purchases is to ensure continuous flow of raw materials of right quality, right quantity, and right price and from right sources. Another objective of purchasing the avoidance of duplication and wastage with respect to various items purchase.

Centralized purchase by medical stores procures the drugs on behalf of all the departments and helps in getting quality drugs at cheaper rates. Some important terms explained below.

- **Right Quality**-Right quality means the quality which is available according to the particulars mentioned in terms of grades, brands or trade name, Physico -chemical characteristics, etc. The quality must describe even the national standards to the extent it is possible.
- **Right Quantity**-Right quantity is an important parameter of purchasing for continuous supply of raw materials. "Economic order Quantity" or any other technique may be followed in order to avoid shortage.
- **Right Price**-The term right price means consistent matching with the quality of drug. Generally tender system is followed in hospitals and the lowest bidder is chosen for supplying the order
- **Right Source**-The supplier should be dependable and capable of supplying
- **Right Time**-Purchased department should have lead time information for all products. Lead time is the total time period between the placing of order and receipt of material while doing purchases. The purchase committee should consider emergency situations like floods, strikes, accidents, etc.

6. PURCHASE PROCEDURE

Purchase procedure involves different steps for procurement of goods.
They are as under:

I. DETERMINATION OF REQUIREMENT

The materials to be purchased for particular period are well planned for the purpose of their regular and continuous use. Purchase requisition is generally prepared by departmental heads and provides information mentioned below.
(a)Type of material to be purchased,
(b)Time of requirement,
(c)Quantity to be purchased

II. SOURCE OF SUPPLY

The pharmacy and therapeutic committee sets adequate standards for the purchase of quality drugs. Procurement of stores is generally done by following sources:

i. Medical store depot
ii. Directorate general supplies and disposals
iii. Direct from wholesalers and manufacturers
iv. By inviting tenders
v. Emergency drugs

III. PURCHASE ORDER

After selecting the supplier, the chief pharmacist or any other suitable authority prepares a purchase order giving detailed description, specification, packaging, price and quantity needed etc. of the items. This purchase order is in written form, and it is the evidence of contract between the buyer and the supplier. Number of purchase order copies varies from hospitals to hospital.
(a) The original copy is sent to the supplier.
(b) One copy for accounts section.
(c) One copy for purchase department.
(d) One copy for the department.
(e) Fifth and Sixth copy for concerned receiving department.
(f) Seventh copy as history copy. The purchase order should clearly indicate the terms and conditions, i.e., price, quality, and time of delivery. There should be a regular follow-up of purchase order so the drugs and supplies can be received timely.

GENERAL TERMS AND CONDITIONS

- ✓ Deliveries must be made inside the hospital premises.
- ✓ Prepare all transport charges.
- ✓ The hospital will not be responsible for goods supplied which are not on this order form, not duly signed by the purchase officer.
- ✓ All consignments are subject to inspection.
- ✓ Installation and Demonstration, if required, is essential.
- ✓ No packing, forwarding or any other charges will be paid extra.

IV. RECEIPT OF ACKNOWLEDGMENT

After placing the order to supplier by sending a copy of purchase order, the supplier in turn sends acknowledgement of the order saying that he will be able to supply the goods with the terms and conditions which are mentioned in the purchase order.

V. RECEIPT OF DRUGS

On receipt of drugs, there should be a system in the stores whereby the supply of drugs received in the medical stores from the manufacturer are properly checked by person specially assigned for this purpose. Preferably the same person is responsible for reviewing the stocks, date of expiry, description, quantity, batch number, as mentioned in the order form.

Random sampling can be done to make sure that products confirm to the tendered specifications like date of expiry and visible sign of deterioration, such as change of colour, caking etc.

If any such deterioration is observed the matter should be reported to medical superintendent and local drug inspector. These stocks should never be used until the drug inspector's permission is granted and even the information should be sent to the manufacturer.

After the thorough examination of drugs, the above officer should give "No objection to accept the supply" in writing on the hospital copies of delivery challans, Invoices by putting signature and date. The invoice received from the supplier is sent to accounts section for accuracy along with price and quantity. After verification, the accounts section certifies and passes, the invoice for payment and on this basis, cashier makes the payment by cheque/draft.

VI. DISTRIBUTION OF DRUGS TO WARDS

Drugs should be supplied in the original packing of manufacturers. However, if it is not possible to do so, then that should be supplied in clean containers so that the integrity and original properties can be preserved. Name and quantity of the drug should be properly labelled.

It is always advisable that suitable precautions should be taken to dispose of "Original empty containers" in order to avoid their misuse. The containers should be destroyed in the presence of a responsible person with a written statement signed by him. Chief pharmacist should visit wards to check whether the drugs are properly stored under special storage conditions like cold storage, cool temperature and at room temperature.

7. INVENTORY CONTROL

Drug store management is based on principles of inventory control. Mismanagement of stores and non-applicability of Scientific and Modern techniques has been identified as the root cause of material storage in majority of hospitals.

OBJECTIVE OF INVENTORY CONTROL

- To supply the materials in time.
- To reduce investment in inventories and made effective use of capital investment.
- Efforts are made to procure goods at minimum price without bargaining the quality.
- To avoid stock out and shortage.
- Wastage is avoided.
- To average out demand fluctuations.

FUNCTIONS OF INVENTORY CONTROL

- ✓ To carry adequate stock to avoid stock -outs.
- ✓ To order sufficient quantity per order to reduce order cost.
- ✓ Purchasing is basic function in inventory management.
- ✓ The basic purpose of purchasing is to ensure continuous flow of raw material of right quality, right quantity, and right price from right source at right time.
- ✓ To stock just enough to minimize inventory carrying cost.

8. TECHNIQUES OF INVENTORY CONTROL / METHODS USED FOR ANALYSIS OF DRUG EXPENDITURE

a) ABC analysis
b) VED analysis
c) EOQ
d) Lead time
e) Buffer stock
f) FIFO
g) FEFO
h) FSN analysis
i) SOS analysis
j) XYZ analysis

ABC ANALYSIS

ABC (Always, Better, Control) analysis is an inventory categorization technique. It is a basic tool with a selective approach for concentration upon the items. As ABC analysis the items are divided into three categories

"A item" with very tight control and accurate records,
"B items" with less tightly controlled and good records, and
"C items" with the simplest controls possible and minimal records.

The ABC analysis provides a mechanism for identifying items that will have a significant impact on overall inventory cost, while also providing a mechanism for identifying different categories of stock that will require different management and controls.

The ABC analysis suggests that inventories of an organization are not of equal value. Thus, the inventory is grouped into three categories (A, B, and C) in order of their estimated importance.
A "items are very important for an organization. Because of the high value of these 'A' items, frequent value analysis is required. In addition to that, an organization needs to choose an appropriate order pattern (e.g., 'just-in-time') to avoid excess capacity.
'B' items are important, but of course less important than 'A' items and more important than 'C' items. Therefore, 'B' items are intergroup items.
'C' items are marginally important.
There are no fixed thresholds for each class, and different proportions can be applied based on objectives and criteria. ABC Analysis is similar to the Pareto principle in that the 'A' items will typically account for a large proportion of the overall value, but a small percentage of the number of items.

Examples of ABC class are
'A' item – 20% of the item's accounts for 70% of the annual consumption value of the items
'B' items – 30% of the item's accounts for 25% of the annual consumption value of the items
'C' items – 50% of the item's accounts for 5% of the annual consumption value of the items

Another recommended breakdown of ABC classes
"A" approximately 10% of items or 66.6% of value
"B" approximately 20% of items or 23.3% of value
"C" approximately 70% of items or 10.1% of value

(II) VED ANALYSIS
It is an inventory management technique that classifies inventory based on its functional importance. It categorizes stock under three heads based on its importance and necessity for an organization for production or any of its other activities. VED analysis stands for Vital, Essential, and Desirable

V- VITAL CATEGORY
As the name suggests, the category "Vital" includes inventory, which is necessary for production or any other process in an organization. The shortage of items under this category can severely hamper or disrupt the proper functioning of operations. Hence, continuous checking, evaluation, and replenishment happen for such stocks. If any of such inventories are unavailable, the entire production chain may stop. Also, a missing essential component may be of need at the time of a breakdown. Therefore, order for such inventory should be before-hand. Proper checks should be put in place by the management to ensure the continuous availability of items under the "vital" category.

E- ESSENTIAL CATEGORY
The essential category includes inventory, which is next to being vital. These, too, are very important for any organization because they may lead to a stoppage of production or hamper some other process. But the loss due to their unavailability may be temporary, or it might be possible to repair the stock item or part. The management should ensure optimum availability and maintenance of inventory under the "Essential" category too. The unavailability of inventory under this category should not cause any stoppage or delays.

D- DESIRABLE CATEGORY
The desirable category of inventory is the least important among the three, and their unavailability may result in minor stoppages in production or other processes. Moreover, the easy replenishment of such shortages is possible in a short duration of time.

(III) ECONOMIC ORDER QUANTITY (EOQ)
Economic order quantity (EOQ) is the ideal order quantity a company should purchase to minimize inventory costs such as holding costs, shortage costs, and order costs. The formula assumes that demand, ordering, and holding costs all remain constant.

EOQ is an important cash flow tool. The formula can help a company control the amount of cash tied up in the inventory balance. For many companies, inventory is its largest asset other than its human resources, and these businesses must carry sufficient inventory to meet the needs of customers. If EOQ can help minimize the level of inventory, the cash savings can be used for some other business purpose or investment.

The EOQ formula determines a company's inventory reorder point. When inventory falls to a certain level, the EOQ formula, if applied to business processes,

triggers the need to place an order for more units. By determining a reorder point, the business avoids running out of inventory and can continue to fill customer orders. If the company runs out of inventory, there is a shortage cost, which is the revenue, lost because the company has insufficient inventory to fill an order. An inventory shortage may also mean the company loses the customer or the client will order less in the future.

(IV) LEAD TIME

The lead time is the sum of the supply delay and the reordering delay. The lead time is the applicable duration to calculate the lead demand, the safety stock or the reorder point through a direct quantile forecast. The longer the lead time, the higher the total inventory level or the larger is the safety stock, resulting in excess of investment in inventories. As far as possible efforts should be made to decrease the lead time for effective inventory control.

(V) BUFFER STOCK

Buffer stock is used in emergency to meet the unforeseen demands. in other words, it refers to minimum quantity of a particular item which must be kept in the stores of all time. Buffer stocks can be calculated using the following formula

Buffer stocks needs following factors to be taken into consideration like

Buffer stocks= (Maximum consumption rate / day average- consumption rate / day) X lead time.

- Lead time

(VI) FIFO

F- First
I-In
F-First
O-Out

First – In, First -Out, is important for companies that distribute products with expiration dates.
It is a safe practice that ensures your products will not expire or go bad.

With FIFO, the oldest products are used or picked first, ensuring product quality and safety.

(VII) FEFO

F-First
E-Expire
F-First
O-Out

- First Expired, First-Out, is similar to FIFO in that items closest to the expiration will be shipped first.
- The "E" refers to the expiration date of the product. In order for the FEFO methodology to be used, items must have serial or lot numbers on them and the item has to be posted to inventory with an expiration date.

(VIII) FSN ANALYSIS

- FSN: Fast moving, slow moving and non-moving.
- Date of receipt or last date of issue, whichever is later, is taken to determine the no. of months which have lapsed since that last transaction.
- The items are usually grouped in periods of 12 months.
- It helps to avoid investments in non-moving or slow items. It is also useful in facilitating timely control.
- For analysis, the issue of items in past two or three years are considered.
- If there are no issues of an item during the period, it is 'N' item.
- Then up to certain limit, say 10-15 issues in the period, the item is 'S' item.
- The items exceeding such limit of no. of issues during the period are 'F' items.
- The period of consideration and the limiting number of issues vary from organization to organization.

(IX) **SOS ANALYSIS**

- 'S' stands for Seasonal items and 'OS'- Off Seasonal items.
- In general, it is merit to seller to buy seasonal items at lower price and kept inventory and sell them at high price during off seasons.
- If not, the seller must buy the goods at higher prices during off seasons.
- Decisions are taken based on the fluctuations and availability.

XYZ ANALYSIS

- This helps to control the average inventory model value.
- 'X' items which are 10% of no. of items stored.
- 'Y' items are 20% of no. of items stored.
- 'Z' items are 70% of no. of items stored.
- This analysis focuses on efforts to reduce the inventory of these items.

9. MODERN COMPUTERIZATION OF INVENTORY CONTROL

Presently national information centre (NIC) is working hard to prepare software which would facilitate proper control of inventory through the implementation of accepted principles of material management such as ABC analysis, "Last is the first out" etc. It would minimize the chances of validity of drugs expiring while in storage by the transfer of stocks from the surplus to deficit depots.

Computerization will serve following purposes

- Less investment
- Less storage
- Fast supply of drug
- Control on Issue of Drugs
- Minimum wastage
- Prompt payments

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