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DRUG STORE MANAGEMENT AND INVENTORY CONTROL

CONTENT

- Organisation of drug store,
- Types of materials stocked and storage conditions,
- Purchase and inventory control:
 - Principles,
 - Purchase procedure,
 - Purchase order,
 - Procurement and stocking,
 - Economic order quantity,
 - Reorder quantity level, and
 - Methods used for the analysis of the drug expenditure

DRUG STORE/PHARMACY/COMMUNITY PHARMACY/CHEMIST'S

- A retail shop which provides prescription drugs, among other products.
- At the drug store, a pharmacist oversees the fulfillment of medical prescriptions & 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 & distributing the drugs and medicines to various departments.

ORGANISATION OF DRUG STORE

- Stores are defined as a sub-organisation 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.

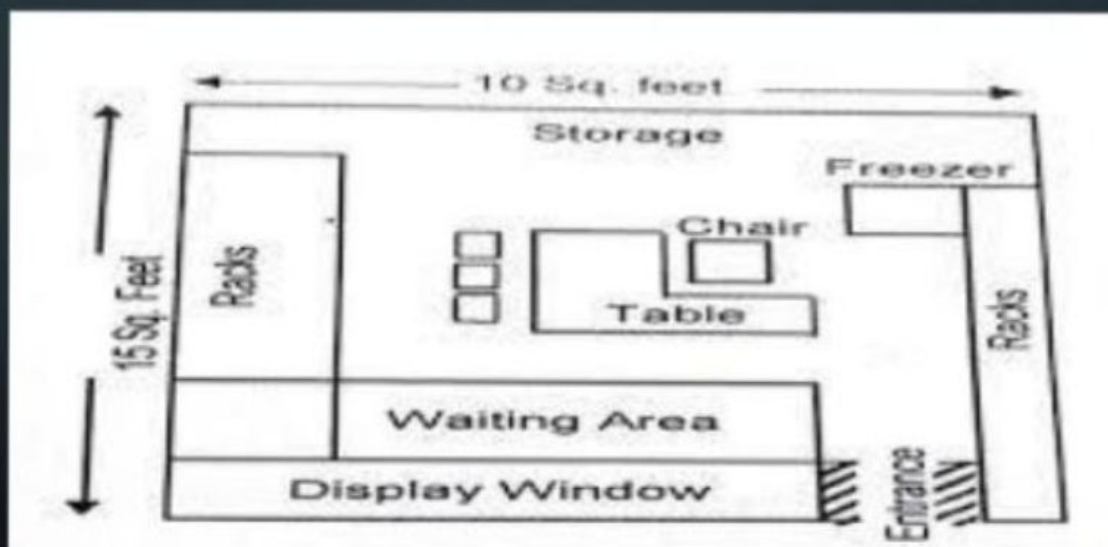
OBJECTIVES OF DRUG STORES

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

LAYOUT OF DRUG STORE

- Preferably located on the ground floor close to the pharmacy.
- Area: at least 600-1000 sq ft.
- Adequate storage facilities to avoid deterioration of the drugs, chemicals, biological etc. by moisture or heat.
- **An ideal store :**
 - 02entrances, one for receiving the articles and other for issue of materials.
 - Racks : for storage of material made of angled iron, having partitions.
 - Costly items are stored in closed bins.
 - The height of racks depend up on the height of ceiling & should be above 2/3rd the height.

RETAIL DRUG STORE DESIGN



DRUG STORE

- A definite location code is to be followed in order to identify the product or material placed in store.
- For this purpose, following system may be adapted:
 - (i) **F S N**- Fast moving, slow moving, non moving
 - (ii) **H M L**- Heavy, medium, light materials
- Fast moving materials are placed near the issue exit while
- Non-moving articles are placed far from the exit.
- Heavy items are placed at the bottom & light items on the top.

DRUG STORE.....

- Records are maintained using Bin Card system.
- A ledger or bin card has 4 codes like-
 - 1 2 3 4 (1-Panel, 2-Row, 3-Rack, 4-Bin)
 - A 5 B 3

This means panel A, 5th row, Rack B and Bin 3

Materials can be entered either in ledger or bin cards in Alphabetical order but this may cause problems as number of drugs are known by different name.

They may be categorised & stored depending up on their therapeutic effect.

TYPES OF MATERIALS STOCKED

- Sufficient number of racks should be provided for storage of drugs & supplies.
- CO₂ fire extinguishers at strategic points along with fire buckets to fight sudden fires due to stored drugs & chemical.
- Stocked Materials are:
 - (i) Capsules, tablets, liquid dosage form & injections etc.
 - (ii) Biological antibiotics in refrigerator.
 - (iii) Narcotic & psychotropic substances stored under lock & key.
 - (iv) POISONS are stored in separate closed rack, labelled as "POISON".
 - (v) Alcohol & alcohol containing preparations.
 - (vi) Large bulk items on bottom.
 - (vii) Vaccines & other thermolabile drugs @ cold store (2-10°C).
Antibiotics, vitamins liver preparations @ at cool temp (15-20°C).
 - (viii) To avoid pilferage, store costly drugs & prescribed schedule X drugs separately under lock & key.

STORAGE CONDITIONS

Condition	Temperature
Cold storage	2-8°C
Cool temp	8-25°C
Room temp RT-temp	Temperature prevailing in working area
Warm	30-40°C
Excessive Heat	Above 40°C

COLD STORAGE (2-8°C)

- A separate room or a portion should be maintained at this temp range.
- Should have a recording thermometer & temp should be noted at least twice daily.
- It should remain under the supervisor & in case a separate room is not available, adequate number of refrigerator should be provided for the purpose.
- The maintenance of these refrigerators in working order is the responsibility of the supervisor.
- Drugs : insulin, sera, whole human blood, frozen plasma, thromboplastin, oxytocin injection, and certain vaccines etc. **are not allowed to freeze.**
- The chief pharmacist should personally check that such drugs are stored at respective places as per their prescribed storage conditions.

LIST A – (DRUGS REQUIRING COLD STORAGE 2-8°C)

1. Sera
2. Vaccines
3. Whole human blood
4. Concentrated human red blood corpuscles(4-6°C)
5. Normal human plasma
6. Frozen plasma –at a temp not above -18°C
7. Thrombin
8. Tromboplastin
9. Cobra venom in solution
10. Viper venom in solution
11. Posterior pituitary injection
12. Oxytocin injection
13. Vasopressin injection
14. Corticotropin gelatin injection
15. Corticotrophin zinc oxide injection
16. Cholistin sulphamethate injection]
17. Suxamethonium chloride injection
18. Insulin preparation
19. Human gamma globulin injection
20. Normal liquid human serum albumin
21. Schick test toxin

STORAGE AT COOL TEMPERATURE (8-25°C)

- The space of this room should be adequate considering the maximum stock of drugs likely to be purchased by the hospital during any time of the year.
- The chief pharmacist should ensure that no drug falling in this category is stocked away from this room.
- An inspection register should be maintained by the Chief pharmacist.
- Examples: antibiotics, vitamins, liver preparations.

LIST – B (DRUGS REQUIRING STORAGE AT COOL TEMP. 8-25°C)

Antibiotics preparations

- Crystalline penicillin
- Potassium phenoxymethyl penicillin
- Benzathine penicillin
- Cloxacillin
- Methicillin
- Ampicillin
- Streptomycin sulphate and chloride
- Tetracycline, oxytetracycline, chlortetracycline
- Bacitracin and zinc bacitracin

Arsenicals (inj)

- Neoarsphenamine
- Sulpharsphenamine
- Tryparsanide

Blood Preparations (-below 20°C)

- Dried plasma
- Human fibrin foam
- Human fibrinogen
- Human serum dried
- Human thrombin

Hormone preparations

- Corticotropin
- Betamethasone sodium phosphate injection
- Chorionic gonadotropin
- Prednisolone sodium phosphate injection
- Oxytocin tablets

Others

- Dextran injection
- Dextran sulphate injection
- Dextrose injection
- Dextrose and sodium injection
- Heparin injection BP
- Hyaluronidase injection
- Chlorambucin preparations
- Chorexidine
- Choline theophylline preparation
- Liver injection crude
- Ergot liquid extract.

Vitamin preparations

- Preparation containing vit. A, vit. B1, vit. B2, vit. B6, vit. C, vit. D
- Vit. B complex elixir and injection
- Vit. K injection
- Vit. K preparations

PURCHASE AND INVENTORY CONTROL

- Basic purpose of purchases : To ensure continuous flow of raw materials of right quality, right quantity, right price and from right sources.

Objective of purchasing : avoidance of duplication & wastage with respect to various items purchased.

Centralized purchase by medical stores procures the drugs on behalf of all the departments & helps in getting quality drugs at cheaper rates.

Some important terms

1. **Right Quality** - 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.

2. **Right Quantity** - 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.

3. **Right Price** - consistent matching with the quality of drug. Generally tender system is followed in hospitals & the lowest bidder is chosen for supplying the order.

4. **Right Source** -The supplier should be dependable & capable of supplying as per requirements from time to time.

The selection of supplier requires consideration of various factors.

5. **Right Time** -Purchase department should have lead time information for all products.

Lead time: Total time period between the placing of order & receipt of material while doing purchases.
The purchase committee should consider emergency situations like floods, strikes, accidents, etc.

PURCHASE PROCEDURE

- **Steps for procurement of goods:**

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 & 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 purchases from local market

(i) Medical Store Depot (MSD).

- This organisation has 06 medical store depot: Mumbai, Chennai, Calcutta, karnal, Hyderabad, Guwahati.
- The purchased items are subjected to various in house tests at the testing units in Chennai and Mumbai.
- It runs on no-profit & no-loss basis.

(ii) Directorate General Supplies and Disposals (DGS &D)

- DGS&D calls for tender and places the order. The payment is made only after the verification of inspection report by the indenter on the prescribed Performa.

(iii) Direct Purchase from Wholesellers or Manufacturer

- Direct purchases from wholesalers, manufacturers are done following a proper purchase procedure. Materials are then received and stocked at their relevant places under proper storage conditions.

(iv) By Inviting tenders

- Tenders are invited from various supplier and generally the lowest bidder is choosen for supplying the order. However price and quality both are considered as well.

(v) Emergency drugs from local market

- Items not available at MSD, DGS & D and any emergency drug which is out of stock can be immediately purchased from local market. For this purchase form is prepared in duplicate, one copy is sent to the department & other copy is retained in the pharmacy.
- This avoids the department concerned to re-order the same item.

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 that drugs and supplies can be received timely.

PURCHASE REQUEST FORM

PURCHASE REQUEST FORM

All India Institute of Medical Sciences (AIIMS), Bhubaneswar

Ref. _____ Date _____
 Code no. _____ Charge no. _____
 Purchase order no. _____

Date of supply: _____

Suggested Vendors:

1. _____
2. _____
3. _____

No	Description of items required, Specification/Prepacking	Price per unit	Units Required	Total Price	Quantity in Hand Required

Requested by: _____ Approved By: _____

All India Institute of Medical Sciences (AIIMS), Bhubaneswar

To ME: _____ Purchase Order No. _____ (Quote this No. on all package)

Date: _____ Our Ref. No. _____

Account Code no. _____

Name of Account: _____ Date: _____

Item No.	Specifications/Packing	Price per Unit	Quantity	Net amount/paid

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 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 either 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 off "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.

Inventory Control

- Inventory control is a scientific system which indicates as to what to order, when to order, how much to order, and how much to stock so that purchasing costs and storing costs are kept as low as possible.
 - Inventory Control is the process by which inventory is measured and regulated according to predetermined norms such as economic lot size for order or production, safety stock, minimum level, maximum level, order level etc.
 - Inventory control is the technique of maintaining the size of inventory at some desire level keeping in view the best economic interest of an organization.
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Objectives of Inventory Control

- To supply the materials in time.
 - To give maximum clients service by meeting their requirement timely, effectively, smoothly and satisfactorily
 - To reduce or minimize idle time by avoiding stock out and shortages
 - To reduce loss due to changes in prices of inventory items
 - To avoid shortage of stock
 - To meet future demand
 - To average out demand fluctuations
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Functions of Inventory Control

- To carry adequate stock to avoid stock-outs
- To order sufficient quantity per order to reduce order cost
- To stock just sufficient quantity to minimize inventory carrying cost
- To make judicial selection of limiting the quantity of perishable items and costly materials
- To take advantage of seasonal cyclic variation on availability of materials to order the right quantity at the right time.
- To provide safety stock to take care of fluctuation in demand/ consumption during lead time.
- To ensure optimum level of inventory holding to minimize the total inventory 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.

➤ With an objective of avoidance of duplication and wastage with respect to various items purchase

Purchase Procedure

It involve different steps for procurement of goods

1. Determination of requirements

- Through purchase requisition prepared by departmental head including types of material, time and quantity required

2. Sources of supply

- Medical store depot
 - DGS&D
 - From wholesaler or manufacturer
 - By inviting tenders
 - Emergency drug from local market
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3. Purchase order

It is a contract between buyer and supplier

4. Receipt of acknowledgement

5. Receipt of drug

6. Distribution of drug to wards

Inventory Analysis

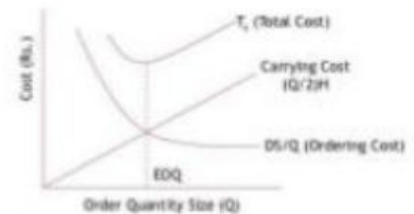
- Three level of analysis-
 - Overall analysis,
 - Category analysis
 - Individual item analysis

Economic order Quantity (EOQ)

- Economic Order Quantity or Fixed Order Quantity system is the technique of ordering materials whenever stock reaches the reorder point.

- It includes ordering cost and carrying cost

- Ordering Costs-It is the cost of ordering the item and securing its supply.
- It Includes Expenses from raising the indent, Purchase requisition by user department till the execution of order, Receipt and inspection of material
- Inventory Carrying Costs- Costs incurred for holding the volume of inventory and measured as a percentage of unit cost of an item
- It includes Capital cost, Deterioration cost, Taxes on inventory, Insurance cost, Storage & handling cost
- Can be calculate by tabular method,
graphical method or algebraic formula



Techniques or methods of inventory analysis

1. Always Better Control (ABC) Analysis

- This technique divides inventory into three categories A, B & C based on cost of material and annual consumption value.

 - A item- 10% of total items (costly) which have the highest rupee percentages (approx. 70%). Require proper storage and handling, over stocking should be avoided.

 - B item - 20% of all items (neither costly nor cheaper) with the next highest rupee percentages (20%).

 - C item- 70% of all items (cheaper) with the lowest rupee percentages (10 %)
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Advantages of ABC Analysis

- Gives rewarding results quickly
- Helps to point out obsolete stocks easily
- In case of “A” items careful attention can be paid at every step such as estimate of requirements, purchase, safety stock, receipts, inspections, issues, etc. & close control is maintained
- Helps better planning of inventory control
- Provides sound basis for allocation of funds & human resources

Disadvantages of ABC Analysis

- Proper standardization & codification of inventory items needed
 - Considers only money value of items & neglects the importance of items for the production process or assembly or functioning
-

2. VED (Vital, Essential & Desirable) Analysis

- It is based on utility of material, importance of item and its effect on the functioning and efficiency of a hospital
 - Vital items – Its shortage may cause havoc & stop the work in hospital/ward/patient care. They are stocked adequately to ensure smooth operation.
 - Essential items - Here, reasonable risk can be taken. If not available, the work does not stop; but the efficiency of functions in hospital/ward/patient care is adversely affected due to expediting expenses. They should be sufficiently stocked to ensure regular flow of work
 - Desirable items – Its non availability does not stop the work because they can be easily purchased from the market as & when needed. They may be stocked very low or not stocked.
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3. FSN (Fast moving, slow moving & non moving) Analysis

- Classification is based on the pattern of issues from stores & is useful in controlling obsolescence
- Date of receipt or last date of issue, whichever is later, is taken to determine the no. of months which have lapsed since the last transaction

- It helps to avoid investments in non moving or slow items.
- N item- If there are no issues of an item during the period (1 – 2 yr)
- S item- up to certain limit, say 10-15 issues in the period
- F items- The items exceeding limit of no. of issues during the period

- The period of consideration & the limiting number of issues vary from organization to organization.

4. Perpetual Inventory System

- Recording of store balance after receipt and issue of item to facilitate regular checking
 - After every receipt or issue the entry is made in bin card and balance is adjusted
 - **Bin card** is a document maintained by store keeper to keep record of all items
 - Bin card is used for each material
 - Each receipt, issue or returns are recorded on bin card in chronological order and latest balance is maintained
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Reorder Level

- The reorder level is the level of the stock of a particular item, held by the firm, when an order is needed to be placed for avoiding the risk of being out of stock. It is based on the average time taken by the supplier for replenishment, maximum usage of the item during the replenishment time, & safety stock requirement. It is also known as reorder point. Reorder level is the stock level of a particular item of inventory, at which a firm needs to place an order for the fresh supply or replenishment of the item. It gives a signal regarding when to place a new order for the fresh supply of an inventory item.
- The internal factors involved in reorder level are maximum usage during the lead time, safety level, & replenishment period. Whereas the external factor involved in reorder level is lead time taken by the supplier. The main risk factor in reorder level is being out of stock & some other risk factors are disruption in production & foregone sales.
- Formula for estimation of reorder level:

$$\text{Reorder level} = (\text{Average daily usage rate} \times \text{Average lead time in days}) + \text{Safety level}$$