**MATERIAL MANAGEMENT**

## Introduction

Material management is a scientific technique, concerned with Planning, Organizing and Control of flow of materials, from their initial purchase to destination. It is concerned with planning, organizing and controlling the flow of materials from their initial purchase through internal operations to the service point through distribution. The material management in the health care system is concerned with providing the drugs, supplies and equipment needed by health personnel to deliver health services.. About 40 percent of the funds in the health care system are used up for providing materials. It is of great importance that materials of right quality are supplied to the consumers

Material management integrates all materials functions

* Planning for materials
* Demand estimation
* Purchasing
* Inventory management
* Inbound traffic
* Warehousing and stores
* Incoming quality control

## 1. Concepts

Material management is concerned with providing the drugs, supplies and equipment needed by health personnel to deliver health services. The right drugs, supplies and equipment must be at the right place, at the right time and in the right quantity in order that health personnel deliver health services. Without proper material, health personnel cannot work effectively, they feel frustrated and the community lacks confidence in the health services and unless appropriate materials are provided in proper time and is required quantity, productivity of personnel will not be upto expectation.

## Definition

Material management is concerned with providing the drugs, supplies and equipment needed by health personnel to deliver health services.

## Objectives of material management

* To reduce cost of material
* Ensure a good support with suppliers(vendors)
* Effective and efficient handling of materials at all stages and in all sections. In other hand objectives of material management
  + Low purchase price
  + Maintaining continuous supply
  + Maintaining quality
  + Cordial relationship with supplier
  + Low pay roll cost
  + Development of vendose
  + Good evidence
  + Low storage cost
  + Favourable reciprocal relation
  + New material & products
  + Standardization
  + Product improvement
  + Interdepartmental harmony
  + Economic forecasting.

## Goals of material management:

**Optimum materials acquisition**: the purchase of materials must be governed by the most effective purchase, storage, handling and usage practices.

1. **Optimum inventory turnover rate**: inventories of all items must be maintained at the lowest optimum level.
2. **Good vendor relationship**: the organization‟s relationship with its suppliers have a direct bearing on its ability to procure materials on the best possible terms.
3. **Materials cost control**: materials purchase process must be economical and as possible. There must be continuous cost reduction programme.
4. **Effective issue and distribution**: the system of issue and distribution must cater to economical holdings at the point of usage with no possibility of accumulation of large quantities of stock.
5. **Elimination of losses and pilferage**: wastage and pilferage should be controlled by a system of internal audit.

## Aim of Material Management

To get

* 1. The right quality
  2. Right quantity of supplies
  3. At the right time
  4. At the right place
  5. For the right cost.

## Purpose of Material Management

* To gain economy in purchasing
* To satisfy the demand during period of replenishment
* To carry reserve stock to avoid stock out.
* To stabilize fluctuations in consumption
* To provide reasonable level of client services
* Increase efficiency of health care systems.
* Develop knowledge and skills of health care
* Provide materials in required quantity and quality as when required.

## Basic Principles of material Management

* Effective management and supervision; it deals on material functions of

;planning, organizing, staffing, controlling, report and budgeting.

* Sound purchasing method
* Skillful and hard poised negotiation
* Effective purchase system
* Should be simple
* Simple inventory control program.

## Functions of Material Management

* Material planning & budgeting
* Purchasing
* Inventor control
* Cost reduction
* Value analysis
* Receiving & inspection
* Stocking & distribution
* Disposal.

## Procedure

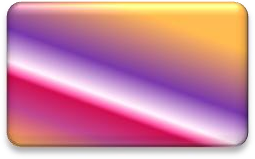
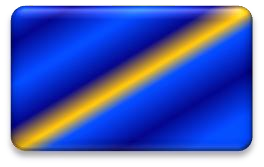
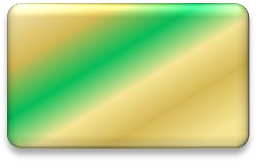
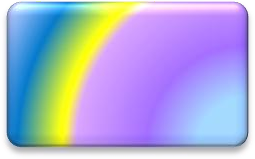
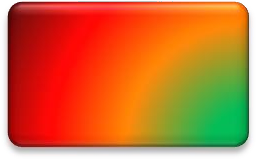
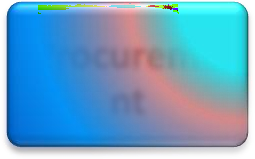
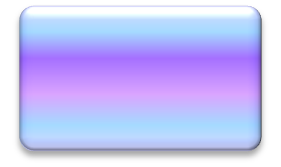
Good material managers adopt the following procedures:

* Taking inventory regularly and systematically
* Requisitioning at indenting according to actual needs
* Receiving and inspecting incoming items
* Storing and protecting items
* Issuing items for use
* Proper use of items.

## Some more procedures

* Identification of need
* Establishment of standards and specification, character, quality with full description
* Preparation of requisition or indents in the predesigned
* Selection of the right source that is supplier
* Determine right price, availability and delivery time
* Placement of purchase order
* Follow up
* Arranging of receipt, inspection, rejection replacement for defective pieces.
* Verification of invoices
* Payment of bills
* Maintenance of record.

# PROCESS OF MATERIAL MANAGEMENT



**Budgeting**

**& material**

**planning**

**Demand**

**forecasting**

**Procureme**

**nt**

**Receipt,**

**inspection & payment**

**Usage**

**Issue and**

**distributio**

**n**

**Inventory**

**control**

**Storage**

**Disposal &**

**condemnati on.**

**Collusion**

**Pilferage**

The process of material management involves planning, review and control of



**Maintenan ce**

* 1. Budgeting and material planning.
  2. Demand forecasting.
  3. Procurement
  4. Receipt, inspection and payment.
  5. Storage
  6. Inventory control.
  7. Issue and distribution.
  8. Usage.
  9. Maintenance.
  10. Disposal & condemnation.
  11. Collusions
  12. Pilferage.

# BUDGETING AND MATERIAL PLANNING:

Based on the data of past levels of performance and on anticipated / plans, capital equipment, consumables and supplies to be procured during the year ahead can be projected department wise. This is the materials budget which should be prepared annually. At periodic intervals carryout a budgetary appraisals and determines the variance between the accruals and the budget.

Important in budgetary control and reduction of material cost is the concept of standardisation. This involves grouping together similar items depending on their specification / use / application so as to choose one of these more universally acceptable for the purpose. Standardisation endures grater relative use of the standard item in relation to similar item available in the market, non duplication of inventory, lower purchase cost and more efficient use of materials. In a hospital standardisation is possible through preference for ISI approved items, limitation in the brands of a drug to be stocked, choice of equipment and furniture build with standard and easily available component.

Related to standardization is the technique of value analysis, which examines all the facts of the function and cost of a product / item in use in order to determine whether the cost can be reduced while retaining all the futures of performance or quality of the product / item.

## Value analysis attempts at addressing the following issues:

* + What are the item / component?
  + What is it intend to do?
  + What does it cost?
  + What else can do the same job?
  + What does the suggested alternative cost?

Introduction of non – disposable, autoclavable, plastic syringes in lieu of easily breakable, more expensive glass syringes is based on the value – analysis principle.

# DEMAND FORECASTING:

Estimation of right amount of each material is the most crucial factor for maximising availability with minimum wastage.

Materials in a hospital may be requisitioned: For an urgent / immediate use or in anticipation of a need; on a one – time basis or repeatedly and continuously to replenish the stock; As a single unit or a bulk requirement.

The grater the crisis situation and immediate need for the item and the smaller the quantity required, the grater will be the procurement price and the incidental cost of purchase. Anticipate the need for the item. Bulk price can be affected with maximum price discounts through demand forecasting.

Methods of forecasting:

Demand estimation or forecasting is done by various methods which includes

1. Last period demand
2. Arithmetic average
3. Moving average
4. **Last period demand:** Forecasting for the next period is done on the basis of the level of demand that occurred in the previous period (last year‟s demand is considered)
5. **Arithmetic average:** average of all past demands is taken for forecasting demand. Arithmetic means found out by averaging out over a time period.

## Moving average:

The moving average method is the one used more widely. A moving average strictly corresponds to the middle of the time over which it is calculated. It serves as a forecast of the immediate next period in the time serves, there is a time / lag equivalent to half the time**/**span. When a moving average is taken to forecast demand, which is showing an upward trend, it will lag behind actual demand, and give consistently low estimates. The reverse occurs when the trend is downward.

Forecasting for the next period is generated by averaging the actual demand for the last „n‟ time periods. The value of the „n‟ should be determined by experimentation. It can be two or three period moving average (last 2-3 year‟s demands are taken into consideration).

A moving average, which uses a large time span, will effectively neutralise the sudden temporary surges in demand. However the grater time span, the grater will be the time**/**lag resulting in a grater error of forecast. A very short time span will be sensitive only to recent demand values, which may be biased because of short term random fluctuations. The choice of a time span is therefore done on the basis of the experience and review has to how closely the forecast correspond with actual demand values.

# PROCUREMENT:

An effective procurement system aims at purchasing of items of acceptable quality, in appropriate quantities, at the minimum price and within the available time.

Purchases may be made by the individual department of the hospitals or by a single purchase department. Centralised purchasing has the advantages in that quantity discounts are possible because of standardisation and bulk orders. Purchasing cost is decreased because of the consolidation and non duplicate orders. There is better management control as all aspects of purchase can be screened by the administration. It is usual for hospitals to provide for department purchasing by the pharmacy and the dietary department and centralized purchasing by the main stores – purchase department. A group of hospitals having common interest (e.g. locates in the same region), may also get together and constitute an agency to effect bulk purchases on their behalf.

## Objectives of procurement system:

* 1. Acquire needed supplies as inexpensively as possible
  2. Obtain high quality supplies
  3. Assure prompt and dependable delivery
  4. Distribute the procurement workload to avoid period of idleness and overwork
  5. Optimize inventory management through scientific procurement procedures

## Methods in Procurement Process and Negotiation Strategies

1. **Open tender**

Public bidding, resulting in low prices

* + Published in newspapers
  + Term - 4 weeks
  + Quotations must be sent in the specific forms that are sold, before the time &date mentioned in the tender form
  + In technical items, „two packets or two bins‟ system is followed. Offers are given in two separate packets.
    - Technical bid
    - Financial bid
  + First technical bid is opened & short listed
  + Then financial bid of selected companies are opened & lowest is selected
  + Delayed tenders & late tenders are not accepted. But if, in case of delayed tenders, if the rate quoted is very less, then it can be accepted.
  + Quotations are opened in presence of indenting department, accounts & authorized persons of party
  + Validity of tenders – generally 90 days

1. **Restricted or limited tender** From limited suppliers (about 10) Lead-time is reduced

Better quality

## Negotiated procurement

Buyer approaches selected potential Suppliers and bargain directly Used in long time supply contracts

## Direct procurement

Purchased from single supplier, at his quoted price Prices may be high

Reserved for proprietary materials, or low priced, small quantity and emergency purchases

## Rate contract

Firms are asked to supply stores at specified Rates during the period covered by the Contract

## Spot purchase

It is done by a committee, which includes an officer from stores, accounts and purchasing departments

## Risk purchase

If supplier fails, the item is purchased from other agencies and the difference in cost is recovered from the first supplier

1. **Many Suppliers Strategy** Many sources per item Adversarial relationship Short-term

Little openness Negotiated, sporadic PO‟s High prices

Infrequent, large lots Delivery to receiving dock

## Few Suppliers Strategy

1 or few sources per item Partnership (JIT)

Long-term, stable

On-site audits and visits Exclusive contracts

Low prices (large orders) Frequent, small lots Delivery to point of use

## Stockless Purchasing:

This means that the supplier maintains the inventory for the purchaser. Here, the cost of stocking inventory has been temporarily transferred from the purchaser to the supplier. If the supplier can maintain the stocks for a variety of customers who use same products, then there may be net savings in this option. Otherwise, purchasing costs may go up.

These include forming a partnership relationship with the distributor and hospital, making consistent, scheduled deliveries to the distributor, working with hospital administration and materials management to determine the facility's needs and developing a "stockless policy."

## k. Just In Time Purchasing:

Just in time (JIT) purchasing is directed toward the reduction of waste (that is present at incoming inspection, excess inventory and poor quality) and delay. This waste and delay is present in all production processes. (Not only in purchasing), therefore, JIT approach can be applied to all areas of production.

1. JIT tries to reduce all non-value-added activities.

If purchasing personnel can select more reliable vendors, purchased items can be received without counting, inspection.

1. Elimination of in-plant inventory.

No raw material inventory is necessary if materials are perfectly delivered to where they are needed. Material should be delivered in small lots directly to the using department as needed. Elimination of inventory allows managers to see production problems that are hidden behind those inventories.

1. Elimination of in-transit inventory

In-transit inventory is the inventory flowing between the plant and material suppliers. It can be reduced by encouraging suppliers to locate near the plant. (The shorter the flow of material the less inventory and the less transportation costs.) Another way to reduce in-transit inventory is to have inventory on **consignment**. Under a consignment arrangement the supplier maintains title to the inventory. But, it locates its warehouse where the user has its stockroom.

1. Quality and reliability improvement

To obtain improved quality and reliability, Vendors and purchasers must have mutual understanding and trust. Suppliers‟ long term commitment to the relationship should be increased.

## Contractual services followed by health Institutions:

* 1. **Fixed quantity contract:** supply firms are called upon to offer to supply a definite quantity of stores by a specified date. Such contracts are binding both parties
  2. **Running Contract:** these contacts are for supply of an approximate quantity of stores at a specified price during a certain period of time.
  3. **Rate contract:** most common contracts in health care institutions, in which firms are asked to supply stores at specific rates during the period covered by the contract. No fixed quantity is mentioned. This system of offers maximum flexibility in ordering specified quantity of materials at frequent intervals. This is also helps to maintain optimum inventories and minimise the chances of deterioration or obsolescence of the medical stores. The materials which are procured, should be received, stored and managed adequately so that these are available when required.

## Points to be noted before purchase of an equipment:

Latest technology

Availability of maintenance and repair facility, with minimum down time Post warranty repair at reasonable cost

Upgradeability Reputed manufacturer

Availability of consumables Low operating costs

Proper installation as per guidelines

## Steps in purchasing:

* Draw up specifications;
* Invite quotations
* Make a comparison of offers (based on basic price, freight and insurance charges, taxes and levels, quantity and payment discounts, payment terms, delivery period, guaranty, vendor reputation,)
* Shortlist offers
* Negotiate for better terms,
* Issue purchase orders,
* Taking care to list out all requirement of the institution,
* Seek an order
* Acknowledgement and follow-up for early supply.

Purchase order to be legally valid and compete should include the following.

* + Order reference number and date.
  + Purchasers name and address.
  + Consignee name and address.
  + Suppliers name and address.
  + Quotation reference and date (when repeat order is give, the previous order reference is to be given).
  + Description of goods (specifications, brand name, catalogue number as per sample).
  + Quantity (units, pack size, weight, quantity per bag).
  + Price (unit price, quantity discount, payment discount, handling charges, sales tax, excise duty, surcharge).
  + Insurance charges (insurance by supplier and buyer).
  + Total value (helps comparison with other supplier offers, ensures review of order size and availability of cash).
  + Packing (free / extra, special packing to be used, case markings.)
  + Shipping instructions (despatch made by air, rail, road, sea, coast, name of the port, railway station, and post office)
  + Delivery date (definite date to be specified).
  + Order acknowledgement (ensures receipt of orders, binds and supplies).
  + Terms and conditions.
  + Inspection (at suppliers site, at hospital)
  + Invoicing instruction (number of copies of invoice, purchase order, copy to be attached and whom to be submitted)
  + Mode of payment (through draft, cheque and cash)
  + Warranty.
  + Signature of authorised purchasers and designation.

## Purchase of drugs and hospital supplies from abroad:

* Obtained the product literature and pro forma invoice listing the price, mode of shipment payment and terms.
* Import licence is generally not required as government recognise hospitals are covered by open general licence and can import without a specific licence, goods of unlimited value. Other hospitals are permitted to import drugs of value up to rupees two lakhs in a financial year.
* Import of drugs required a test licence from drug controller of India. Drugs can be imported only through major ports in India like Delhi, Bombay, Calcutta and Chennai.
* Seek duty exemption if item is not listed for duty free import. Duty exception can be obtained with a non manufactured India certificates and customs duty exemption

certificate from director general of health services New Delhi, through the state health service department.

* Send bank draft for minor purchases. Establish letter of credit for major imports.
* Clear items promptly through customs on intimation of receipt. Avoid demurrage.

## RECEIPT, INSPECTION, ACCEPTANCE AND PAYMENT Procedure for receipt, inspection and acceptance of supplies:

* + While taking delivery from the road transporters, railways, customs, check containers for deficiency and damages.
  + If packing is damaged, insist on „open‟ delivery, checking quantity of packages, individual items, weights, etc. against packing slip / challan.
  + Any damage / loss should be registered immediately through a „claims‟ statement.
  + Cross check with purchase order
  + On receipt of the hospital checks supplies for discrepancies in quantity, quality, product specifications etc.
  + Record shortages, incorrect damaged material, out dated supply and take action accordingly.
  + All supplies should be inspected and certified by the purchase / stores department. In case of bulk orders, random sampling may suffice.
  + Carry out all necessary documentation, day book of receipt, goods inward note, stock ledger, purchase register and bin card.
  + Notify indenters of special purchase requisition regarding arrival of materials.

## Material receipt register format:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Date | Sr. No | Supplier‟s Name | P.O. Ref. &  Date | Challan No. Dt | Quantity receiver | Quantity accepted | Quantity rejected | MRN  no |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |

**Procedure for payment:**

On accepting the goods and certifying correctness, send the bills to the accounts department for payment. Before releasing payment, the account department should ensure that the bills bears proof of receipts of goods, certification of acceptance and completion of purchase documentation.

# STORAGE

Storage and Preservation are an important part of the storekeeping function. When materials remain idle in the store these materials should be taken care of and looked after properly. Otherwise these materials may get perished due to natural chemical reaction like rusting by moisture, melting by heat etc and also may get affected by insets, rats etc. Proper storage ensures that till the time of issue for usage the supplies are adequately preserved to prevent loss or damage. The department stores should be conveniently located to

facilitate easy receipt of materials from suppliers and easy dispatch of supplies to the wards and departments. The materials should be adequately protected from fire, pests, water sewage etc.

## Actions to protect the materials from various adverse effects: -

* 1. Store must be of adequate space.
  2. Divide the store in to homogenous sections with separate areas mark for different groups of items e.g. stationary, furniture etc
  3. No material should be stocked on the floor as it may be affected by dampness, white ants etc.
  4. Categorize items in a group based on their generic name/ application, store similar items contiguously.

## Eg :

* + 1. Stationery, Electrical, Civil Engineering, Cleaning and Similar items may be stocked in the steel racks.
    2. Medicine items may be stocked in the fridge.
    3. Perishable items may be stored in the cold rooms.
    4. Explosive, film, and fuse items may be stored in the AC room.
    5. Attractive items may be stored in shelves under lock and keys.
  1. Keep heavy items as low and as near to the door as possible for easy retrieval. Light items may be placed on top shelves
  2. Daily and periodical cleaning should be carried out.
  3. Daily and periodical verification of stock should be carried out to ensure correctness of stock.
  4. Proper method of handling should be followed to avoid damages to the materials.
  5. Preservation materials should be applied to protect the items.
  6. Hazardous materials should be segregated and stocked in a separate store house away from other store houses.
  7. Safety precautions should be taken and safety appliances should be provided.
  8. First-in, first-out principle to be followed
  9. Follow two bin or double shelf system, to avoid Stock outs
  10. Reserve bin should contain stock that will cover lead time and a small safety stock

## Codification and preparation of bin card:

Based on the nature of the material and on the basis of its generic name application each item purchased and stocked should be given a code – identifying number. Such a number should be unique for each item and must be marked out in the bin card of the item and at its permanent locations.

Bin Card is also called as Cardex, Tag Card etc. The detailed information about the materials is contained in the Bin Card. Normally Bin Card Consists of the information like Qty Received, Qty Issued, Minimum Stock Level, Maximum Stock Level, Reorder Level, Re Order Quantity, Closing Stock, Opening Stock etc. Maintenance of Bin Card System is part of perpetual inventory accounting system.

For every item in stock there should be corresponding bin card. Such a card details the name of the item, its description, code, identifying number, location number, minimum and maximum stock levels as also transactions relating to receipts, issues and stock value balance of the respective item as when such transactions occur. Bin cards are arranged according to the classification and code number system adopted for materials and inserted in suitable cabinets for easy reference and updating.

Beyond the main stores each ward, department will have a sub store. The maximum stock levels here need to be fixed at department, ward levels taking in to consideration the periodically of issues and the rate of consumption. Periodic physical checks by the material sanctioning authority are necessary to prevent hoarding of stock in sub stores.

## Stock register:

Stock Register is a register maintained by the Stores in charge to record all the receipts and issues of the stock items. The given format is typical stock register format giving all the details of inward and outward of the materials for given period of the register. This is a summarized report of all the stock items to help the stores in charge to keep better control on the movement of the materials. Maintenance of Stock Register ensures the effective inventory control.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Issue Value Balance |  |  | recipts |  |  |  |  |  |  |  |  |
| Month  & Date |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. | 10 | 11 | 12 |

# INVENTORY CONTROL

 It is the process of having the necessary equipment and supplies available at the appropriate time. It means stocking adequate number and kind of stores, so that the materials are available whenever required and wherever required. Scientific inventory control results in optimal balance

The most critical question to be asked is “Is it more economical to maintain an item in inventory that to purchase it on demand?”

## Functions of inventory control

To provide maximum supply service, consistent with maximum efficiency and optimum investment.

To provide cushion between forecasted and actual demand for a material

## Concepts relevant in control of inventory cost:

1. **Cyclic system:**

This is a periodic inventory system where the physical stock position is reviewed at periodic fixed intervals and orders are placed depending on the stock on hand and rate of conception. The time interval to be chosen depends on the lead time for the procurement of the item, critically out cost, degree of control required etc.

## Two bin system:

This is a perpetual inventory system where conceptually the stock of each item is held in two bins, one larger bin contains sufficient stock to meet the demands during the interval between the arrival of a order and placing of a next order, the other bin containing stocks large enough to satisfy probable demands during the period of replenishment.

In cyclic system the ordering interval is fixed. But the quantity order varies each time. In contrast in the two bin system the order quantity is fixed but the time for placing orders is not at definite intervals.

1. **Lead time:** This is the time required to obtain the supply once the need is determined,

i.e. it is the average number of days between placing an order and receiving the material.

Lead time is composed of:

* **Administrative lead time or bias time:** Time required for rising purchase requisitions, obtaining quotations, preparing comparative schedule, rising purchase order, order to reach supplier, transit and clearing time when goods are send from out station, checking and inspection of materials after arrival, sending of materials to appropriate stores and recording receipt before issue.
* **Delivery lead time or supplier’s time:** Time for getting materials ready if they are not in stock, transporting them from suppliers godown to buyers receiving station.

The longer the lead time the higher is the inventory level. Attempts must therefore be made to cut down the lead time, especially for high conception value items.

1. **Minimum stock or safety stock or buffer stock:** This amount of stock should be kept in reserve to avoid a stock-out in case of conception increases unexpectedly or in case the lead time turns outs to be longer that normal. It is also the level at which fresh supply should normally arrive

## Factors to be considered in fixing minimum stock:

**Investment:** High value items should have very low or minimum stock. Stock outs can be avoided by close follow up orders, weekly or monthly review of stock item or stock position, close wrap out with suppliers etc. medium value items can have slightly higher minimum stock (one month conception) and items of low value can have a good minimum stock (two months conception).

**Lead time:** If lead time is short, minimum stock may be small.

**Cycle time:** Where bulk orders were place and delivery is staged, safety stock may be fixed on the basis of cycle time (interval between the two deliveries) and not the lead time.

**Form of availability:** If the item is not a standard product and it is to be specially manufactured, it is advisable to keep a higher minimum stock.

**Imported items:** Higher buffer stock is necessary to provide for import procedures.

**Stock-out cost:** Higher minimum stocks is required for critical items whose stock-out cost are high, particularly if it is difficult to obtain such items.

**Shell life:** If shell life is short minimum stock to be altered accordingly.

**Risk of obsolescence:** In case of items which are liable to modification from time to time the stock should be kept low.

1. **Re order point / level:** ROP is the pre determined stock at which an item is to be reordered for replenishing the stock. At this level a fresh recoupment purchase requisition is raised so that the supplies will arrive when the stock reaches the minimum level. This reorder level is equivalent to minimum stock plus requirement during lead time.

## ROL = Average consumption per day X lead time + buffer stock

1. **Maximum stock:** This is the pre determined limit beyond which the stock of an item should not be allowed to go in normal course. It is equivalent to the minimum stock level plus the quantity of supplies received at any point of time. Maximum level is used for controlling investment.

## Turnover of inventory:

Inventory turnover is the qualitative measurement of the number of times that the total inventory value is issued and replaced. The turnover rate is calculated by dividing the

total annual rupee value of supplies issued by the rupee value of closing stock. A turnover rate of 12 times per year is considered ideal though 8-10 times year is more realistic

## Physical inventory:

This involves a physical verification of inventory for comparison of the actual stock units on hand versus the number documented in the records. It provides an opportunity for identification of damage, shrinkage, stock obsolescence.

# METHODS OF INVENTORY CONTROL

Different methods are commonly used depending upon the objective of control. The principles of selective inventory management recognizes that it is impossible to manage and control every item in inventory holding in the same way and still meet the two broad objectives referred to earlier

## Economic order quantity:

It is the quantity at which the cost of ordering the annual requirement of an item and the inventory carrying cost are equal ie when the total of the two costs is the lowest .It seeks to strike a balance between purchase costs and the costs of holding inventory.

Ordering costs includes those incidental costs involved in obtaining quotations placing an order, follow up, personnel required for receipt inspection and payment. The total of ordering costs in a certain period divided by the number of orders for that item gives the average cost per order.

Inventory carrying cost is the cost incurred in connection with the physical storage of an inventory plus the opportunity cost of money tied up in holding it. It includes interest on investment interest foregone because of unnecessary inventory, storage, obsolescence, insurance, and administrative costs.

Economic order quantity seeks to determine the optimum quantity that should be ordered such that both the ordering costs and holding cost are lowest

**EOQ = Average Monthly Consumption X Lead Time [in months] + Buffer Stock – Stock on hand**

Fixation of order quantity through Economic order quantity is subjected to availability of cast, availability of space for storage, variation in pattern of consumption, likelihood of obsolescence , lead time for delivery, government regulations, convenience possible through reduction of work and seasonal availability.

h] **ABC Analysis**:

Classification of stock using ABC Analysis involves analyzing all inventory items on the basis of annual usage time cost. In ABC Analysis , all items are issued during the year are listed out, the unit cost of each item is multiplied by the number consumed to obtain the consumption value and the items are then ranked in order of their annual consumption value. It will then be sent that 5 -10 % of the number of items account for 70-80% of the material consumption costs , the next 10-20% of annual consumption

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| costs , and the balance 70-80% of the number of items account for 5 – 10 % of annual consumption expenditure  **Limitations of the ABC Analysis:**   1. The ABC Analysis, to be fully effective, should be carried out with standardization and codification. 2. It indicates nothing regarding profitability and criticality. Importance is given to an item on the basis of its consumption value, and not on critically. Hence such classification can lead to overlooking the need for an item whose criticality is high, but whose consumption value is low. 3. The ABC Analysis should be reviewed periodically so that changes in prices and consumption are taken in to account.   i] **Vital Essential or Desirable**:  Items may be classified as VED based on their criticality, stock out costs and inconveniences caused to the work of the hospital because of their absence.  **V** category items require a large safety stock, where as **D** items require a small safety stock.  **VED** classification is applicable to a large extent in spare parts management while the consumption of raw materials depend directly and definitely on the market demand, the spare parts demand on the other hand , depend on the performance of plant and machinery.  **J] Fast moving, Slow moving, Non moving [FSN ANALYSIS]:**  Fast moving items are used at a rapid rate, items which have moved at least once in a year.  Slow moving items are used consistently but at a slow rate, items which have moved at least once in a period of one or two years.  Non moving items should be reviewed periodically to prevent date expiry, obsolescence and damage in storage. It may remain in the stock for several months.  **Inventory control register:**  **Name Of Code No. Max. Min Re-Order EOQ/Lot Units Location The Level Level Level size**  **Material**  **Monthly consumption registers:** | | | | | | |
|  | **Date** | **Doc Ref** | **IN** | **OUT** | **Bal** | **Remark** |
|  |  |  |  |  |  |
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# ISSUE / DISTRIBUTION:

Items held in inventory by the stores may be issued through indents to user department on a periodical basis or as and when necessary.

Systems of stocks replenishment to wards are of following types

1. **Requisition or Drug basket system:** At definite intervals when departmental stock level gets low, a requisition is prepared for replenishing the stock and sent to stores. The stores then issue items in compliance with the requisition.
2. **Par level or Topping up systems:** The maximum stock level for each ward is predetermined on the basis of usage rage and frequency of replenishment. This departmental stock is stored in an assigned location.
3. **Exchange cart systems:** This system is similar to the par level system in that there are predetermined maximum stock levels and predetermined intervals for stock replenishment. At predetermined intervals the full cart from the stores is taken to the user area and exchanged for the depleted cart.

# USAGE:

Every effort must be made at all levels in the organisation to utilize supplies in order to avoid any form of wastage. Monitoring of consumption should be effected through monthly supply usage reports to work which summarize items consumed department wise. Material cost can also be decreased by appropriate selection of materials, cheaper substitutes and standardization of supplies.

# MAINTENANCE:

Proper maintenance of equipment, furniture, and fixtures not only ensure their almost continuous availability for use but also an extended life and productivity for the items, thus resulting in lower material costs.

Time and costs of maintenance can be reduced by consideration of following factors during purchase of the capital asserts.

1. **Durability:** Since the equipment will be handled by multiple users provide for an element of over specification so that the item is more sturdy than that available for single person use in the home environment.
2. **Periodical disinfections:** The external surface of the items should be washable and it should provide for sterilization by moist heat, formalin vapour, spirit or other disinfectants.
3. **Repair ability**: Go for items which re more easily repairable.
4. **Spare parts availability**: Standardization of items and opting for those easily available in the market ensures easy availability of spare parts required for repair and mainaintence.
5. **Operation and service manuals:** When purchasing sophisticated equipment it is essential to obtain the operating and service manuals so that repairs can be attended to by the hospital mainaintence department without relying perpetually on the supplier.
6. **Service contracts**: Better terms for service are possible by negotiating service contracts for mainaintence prior to purchase of the equipment. Such contracts should specify minimum number of preventive mainaintence over hard schedules, service charges etc.
7. **Stand by units:** Since the hospital work must carry on even when the equipment is down, wherever possible it is necessary to provide for replacements to tide over the period of repair

# PREVENTIVE MAINTENANCE

* + Purchase with warranty & spares.
  + Safeguard the electronic equipments with: (as per guidelines)
    - Voltage stabilizer, UPS
    - Automatic switch over generator
  + Requirement of electricity, water, space, atmospheric conditions, etc. Must be taken into consideration
  + Well equipped maintenance cell must be available
  + All equipment must be operated as per instructions with trained staff
  + Monitoring annual maintenance contracts. (AMC)
  + Maintenance cell
  + Communications between maintenance cell & suppliers of the equipment.
  + Follow-up of maintenance & repair services
  + Repair of equipment
    - Outside agencies
    - In-house facility

# DISPOSAL/ CONDEMNATION:

Indents are often improperly scrutinized and unofficial inventory builds up in wards / departments because of hoarding of supplies. Thus the nursing supervisors should periodically inspect the stocks attached to each ward and arrange for return of excess stock/equipment.

Each hospital should also have a condemnation to review used materials that are to be disposed off. At times it is possible to recycle or reuse materials or find some other use for the item. If no further use can be found for disposables, used consumables and damaged equipments, it may still have value as scrap.

## Criteria for condemnation:

The equipment has become:

* 1. Non-functional & beyond economical repair
  2. Non-functional & obsolete
  3. Functional, but obsolete
  4. Functional, but hazardous
  5. Functional, but no longer required

## Procedure for condemnation

1. Verify records.
2. Preparation of history sheet of equipment
3. Log book of maintenance & repairs
4. Performance record of equipment
5. Put up in proper form & to the proper authority

## Disposal:

* 1. Circulate to other units, where it is needed
  2. Return to the vendor, if willing to accept
  3. Sell to agencies, scrap dealers, etc
  4. Auction
  5. Local destruction

# COLLUSION:

Frauds involving buyer vendor collusion can account for a significant percentage of avoidable materials costs. For commission either in cash or kind purchase personnel may compromise the interests of the hospital. The vendor finances such payment by infiltrating the price, overstating the quantity or through fraudulent payments. Such frauds can be prevented by intensive internal audit and by involving two or more departments or persons in purchase transactions. It is for this purchase that many hospitals set up separate departments for purchase and for stores.

# PILFERAGE:

Theft is not common. Items may be pilfered by the transporters, receiver, stores personnel or the users. Control of hospital theft is possible with intensive vigilance.

# PLANNING AND PROCUREMENT PROCEDURES IN MATERIAL MANAGEMENT

Material management is a scientific technique, concerned with planning, organizing and controlling the flow of materials from their initial purchase through internal operations to the service point through distribution. The material management in the health care system is concerned with providing the drugs, supplies and equipment needed by health personnel to deliver health services. About 40 percent of the funds in the health care system are used up for providing materials. It is of great importance that materials of right quality are supplied to the consumers. **Material management integrates all material functions;**

* + Planning for materials
  + Demand estimation
  + Purchasing
  + Inventory management
  + Inbound traffic
  + Warehousing and stores
  + Incoming quality control

# MATERIAL PLANNING

"Material planning is the scientific way of determining the requirements that goes into meeting production needs within the economic investment policies”.

- Gopalakrishnan & Sunderasan

It is done at all stages and all levels of management. Material planning is based on certain feedback information and reviews.

## Aim of material management planning

To get:

* + The Right quality
  + Right quantity of supplies
  + At the Right time
  + At the Right place
  + For the Right cost

## Purpose of material management planning

* + To gain economy in purchasing
  + To satisfy the demand during period of replenishment
  + To carry reserve stock to avoid stock out
  + To stabilize fluctuations in consumption
  + To provide reasonable level of client services

## Objectives of material management planning

Primary objectives

* + Right price
  + High turnover
  + Low procurement and storage cost
  + Continuity of supply
  + Consistency in quality
  + Good supplier relations Secondary objectives:
  + Development of personnel
  + Good information system
  + Forecasting
  + Inter-departmental harmony
  + Product improvement
  + Standardization
  + Make or buy decision
  + New materials and products
  + Favorable reciprocal relationships

## Basic principles of material management Planning

Effective management and supervision depends on managerial functions of:

* + Planning
  + Organizing
  + Staffing
  + Directing
  + Controlling
  + Reporting
  + Budgeting
  + Sound purchasing methods
  + Skillful and hard poised negotiations
  + Effective purchase system
  + Should be simple
  + Must not increase other costs
  + Simple inventory control programme

## Techniques of Material Planning

* Bill of Material technique:
  + BOM is the simplest technique of materials planning.
  + Explosion of bill of materials refers to splitting the requirements for the product to be manufactures in to its basic components. E.g. in health care is drugs manufactured in the pharmacy
  + This technique is ideally suited to engineering industries.
  + The technique is based on demand forecasts.
  + Requirement for various materials are listed with their complete specifications
* Past Consumption Analysis Technique
  + In this technique future projection is made on the basis of the past consumption data, which is analyzed taken in to consideration the past and future plans.
  + Statistical tools like mean, median, mode and standard deviation are used in analyzing the past consumption.

## Elements of Material Management Planning

* Demand estimation

A large number of items are used in the hospital. The advisory committee for development of surgical instruments, equipment and appliances (1963) identified 3200 items of instruments, equipments and appliances being used in the hospital.

* Identify the needed items
  + Need for variety reduction-less number of materials, less will be the problems of planning
  + Lying down proper specification based on ISI or other standards
* Calculate from the trends in Consumption
  + Review past the consumption in the past
* Review with resource constraints
  + Availability of funds
* Procurement process planning

## Problems affecting material planning

* + Corporate/ Government objectives and plans
  + Technology available
  + Market demand
  + Lead time and rejection rates
  + Working capital available
  + Nature of inventory required
  + Capacity and its utilization of the organization
  + Seasonal variations
  + Information and data available
  + Overall material policy

# PROCUREMENT

Most organizations have a detailed set of rules and regulations regarding the procedure for ordering for materials. In the Government systems DGHS play a crucial role in purchasing materials of heavy cost.

## Objectives of procurement system

* + Acquire needed supplies as inexpensively as possible
  + Obtain high quality supplies
  + Assure prompt and dependable delivery
  + Distribute the procurement workload to avoid period of idleness and overwork
  + Optimize inventory management through scientific procurement procedures

## Procurement cycle

* + - Review selection
    - Determine needed quantities
    - Reconcile needs and funds
    - Choose procurement method
    - Select suppliers
    - Specify contract terms
    - Monitor order status
    - Receipt and inspection

## Methods in Procurement Process and Negotiation Strategies

* Open tender
  + Public bidding, resulting in low prices
  + Published in newspapers
  + Quotations must be sent in the specific forms that are sold, before the time and date mentioned in the tender form
  + Technical bid
  + Financial bid
* Restricted or limited tender
  + From limited suppliers (about 10)
  + Lead-time is reduced
  + Better quality
* Negotiated procurement
  + Buyer approaches selected potential Suppliers and bargain directly
  + Fix at a rate acceptable to both parties
  + Used in long time supply contracts
* Direct procurement
  + Purchased from single supplier, at his quoted price
  + Prices may be high
  + Reserved for proprietary materials, or low priced, small quantity and emergency purchases
* Rate contract
  + Firms are asked to supply stores at specified Rates during the period covered by the Contract
* Spot purchase
  + It is done by a committee, which includes an officer from stores, accounts and purchasing departments
* Risk purchase
  + If supplier fails, the item is purchased from other agencies and the difference in cost is recovered from the first supplier
* Many Suppliers Strategy
  + Many sources per item
  + Adversarial relationship
  + Short-term
  + Little openness
  + Negotiated, sporadic PO‟s
  + High prices
  + Infrequent, large lots
  + Delivery to receiving dock
* Few Suppliers Strategy
  + 1 or few sources per item
  + Partnership (JIT)
  + Long-term, stable
  + On-site audits and visits
  + Exclusive contracts
  + Low prices (large orders)
  + Frequent, small lots
  + Delivery to point of use
* Contractual services by Directorate General of Supplies and Disposals for Government Institutions
  + Fixed quantity contract: supply firms are called upon to offer to supply a definite quantity of stores by a specified date. Such contracts are binding both parties
  + Running Contract: these contacts are for supply of an approximate quantity of stores at a specified price during a certain period of time.
  + Rate contract: most common contracts in health care institutions, in which firms are asked to supply stores at specific rates during the period covered by the

contract. No fixed quantity is mentioned. This system of offers maximum flexibility in ordering specified quantity of materials at frequent intervals.

## Points to remember while purchasing

* + Proper specification; Seek order acknowledgement
  + Invite quotations from reputed firms
  + Comparison of offers based on basic price, freight and insurance, taxes and levies
  + Quantity & payment discounts and Payment terms
  + Delivery period, guarantee
  + Vendor reputation (reliability, technical capabilities, Convenience, Availability, after-sales service, sales assistance)
  + Short listing for better negotiation terms

## Procurement of equipments- Points to be noted before purchase of equipment:

* + Latest technology
  + Availability of maintenance and repair facility, with minimum down time
  + Post warranty repair at reasonable cost
  + Upgradeability
  + Reputed manufacturer
  + Availability of consumables
  + Low operating costs
  + Installation
  + Proper installation as per guidelines

## Storage

* + Store must be of adequate space
  + Materials must be stored in an appropriate place in a correct way
  + Group wise and alphabetical arrangement helps in identification and retrieval
  + First-in, first-out principle to be followed
  + Monitor expiry date
  + Follow two bin or double shelf system, to avoid stock outs
  + Reserve bin should contain stock that will cover lead time and a small safety stock

## Issue and use

Can be centralized or decentralized

## Inventory control

It means stocking adequate number and kind of stores, so that the materials are available whenever required and wherever required. Scientific inventory control results in optimal balance

## Functions of inventory control

* + To provide maximum supply service, consistent with maximum efficiency and optimum investment.
  + To provide cushion between forecasted and actual demand for a material

# ABC ANALYSIS DEFINITION

ABC analysis helps us in segregating the items from one another and tells us how much valued the items is and controlling it to what extent is in the best interest of the organization.

* It is the analysis of stores items on cost criteria. It has been seen that a large number of items consume only a small percentage of resources and vice versa.
  + A items- Represents high cost centre
  + B items- intermediate cost centre
  + C items- low cost centre.
* “It is the process of classifying items by using values as measure”.

# OBJECTIVE

The main objective is to frame policy guidelines regarding control of items. First of all the items are classified into three classes viz A items, B items and C items. Expensive items are to be branded as A items, which constitute 10% of overall items but whose percentage in terms of value is around 70%. The least expensive items are to be branded as C items, whose number items will be 70% of total number of items but its value will be around 10% of the total items of inventory. The in-between are to be branded as B items whose number of items will be

# THE ABC METHOD OF INVENTORY CONTROL

Also called as ***Pareto analysis***. In ABC analysis, the entire lot of inventory is classified into three groups based on their annual value and not on their individual cost given as:

* ***Class A:*** High value items, which accounts for major share of annual inventory value. Stricter control must obviously be applied on these items right from the initial stages of estimating requirement, fixing the minimum stocks, lead time.

## A items:

1. Rigorous value analysis
2. Rigid estimates
3. Strict and close watch
4. Management of items should be done at top management level
5. Centralized purchasing and storage

* ***Class B***: Medium value items, which do not belong to either of the classes and not so strict control procedures, need be followed in regard to the items in this group.

## B items

1. Moderate controls
2. Purchase based on rigid requirement 3.Reasonably strict watch and control

4. Management be done at middle level

* ***Class C***: Low values items, but are required in large quantities and consists of various types and varieties like clips, washers. It needs only a simple and inexpensive system of control in which some of the routine may be relaxed.

## C items

1. Ordinarily control measures
2. Purchased based on usage estimates
3. Controls exercises by store keeper
4. Management be done at lower levels. 5.Decentralized (delegated) purchasing

Another recommended breakdown of ABC classes:

1. "A" approximately 10% of items or 66.6% of value
2. "B" approximately 20% of items or 23.3% of value
3. "C" approximately 70% of items or 10.1% of value

# ABC CLASSIFICATION LEVELS

|  |  |  |  |
| --- | --- | --- | --- |
| **Items** | **Class A** | **Class B** | **Class C** |
| Number of items as a % of total number | 10 | 20 | 70 |
| Annual usage value as a % on total usage value | 70 | 20 | 10 |

Annual value (a) is defined as: A= VQ,

where, Q= annual consumption on quantity terms

V= value (cost) per item

ABC analysis tells us that 5-10 percent of all items(called A category) accounts for 70% of annual consumption costs, another 10-20% of items (B category) account for 20-30% of the costs, while the balance 70% of items(C category) account for about 5-10% of costs.

# PROCEDURE OF ABC CLASSIFICATION

When carrying out an ABC analysis, inventory items are valued (item cost multiplied by quantity issued/consumed in period) with the results then ranked. The results are then grouped typically into three band. These bands are called ABC codes**.**

* ***Step 1:***

List down item-wise annual consumption of inventory with its unit price and determine the annual consumption of each item.

* ***Step 2:***

Rewrite the above list in descending order of money value with additional column to enter

„cumulative % value‟.

* ***Step 3:***
  1. From the list prepared, mark the serial number of items against which the cumulative % value of annual consumption reaches a figure of 70% approximately. These are called class A items and compute the number of class A items as a percent of total items.
  2. Continue this process down the list and note the serial number of items against which the cumulative % value reads approx. 90%. These additional items constitute class B.
  3. The remaining items in the list form class C items and determines quantity in percent of total number of items.
* ***Step 4:***

Plot a curve with cumulative percentage of annual usage on quantity terms on X-axis and money value on Y-axis.

# CONTROL

* + ***Class A items*** are controlled and purchased only on as-required basis to minimize carrying cost. Higher level control is exercised, these being high value items.
  + ***Class C items*** can be purchased in bulk for the requirement of the entire year, being of low value. The control is exercised at lower level.
  + ***Class B items*** come in between A and C on degree of control.

# ADVANTAGES

* Provides a mechanism for identifying items that will have a significant impact on overall inventory cost

* It helps in economizing ones effort to achieve greater results.

* It helps to segregating those items which ought to be given priority to maximize results.

* The usefulness of this management tool is that, by focusing on the „A‟ category items, 70% results can be achieved with just 5% effort.

* Once A category items are identified, it is possible to devote more attention to these items to minimize purchase costs and exercise control over consumption in a more effective manner.

* Proper use of valuable time of store personnel. * Simple no confusing formulas are involved

# LIMITATION

* When number of items runs into several thousands, it is not convenient to compute and carry out this analysis.
* More chances of deterioration in storage exist since class c items are purchased in bulk and inventory on these piles up.
* Loose control on C may result in shortages.
* ABC focuses on money value and not on functional importance of such items, resulting in shortages of critical items.
* ABC does not take into account variation of prices of items as time goes.
* ABC ignores market conditions, market availability, competitions, seasonal variations etc.

# VED ANALYSIS

In VED Method (vital, essential and desirable) **,** each stock item is classified on either vital, essential or desirable based on how critical the item is for providing health services. The vital items are stocked in abundance, essential items are stocked in medium amounts and desirable items we stocked in small amounts. Vital and essential items are always in stock which means a minimum disruption in the services offered to the people.

# THE VED METHOD OF INVENTORY CONTROL

In VED analysis, the inventory is classified as per the functional importance under the following three categories:

* + Vital (V)
  + Essential (E)
  + Desirable (D)

## Vital:

Items without which treatment comes to standstill: i.e. non- availability cannot be tolerated. The vital items are stocked in abundance, essential items and very strict control.

## Essential:

Items whose non availability can be tolerated for 2-3 days, because similar or alternative items are available. Essential items are stocked in medium amounts, purchase is based on rigid requirements and reasonably strict watch.

## Desirable:

Items whose non availability can be tolerated for a long period. Desirable items are stocked in small amounts and purchase is based on usage estimate.

Although the proportion of vital, essential and desirable items varies from hospital to hospital depending on the type and quantity of workload, on an average vital items are 10%, essential items are 40% and desirable items make 50% of total items available.

# PURPOSES

* In a manufacturing organization, there are number of items which are very vital or critical in production.
* Their availability must be ensured at all times for smooth production, so need to be strictly controlled.
* Essential items follow vital items in their hierarchy of importance.
* Desirable items are least importance in terms of functional considerations, which are loosely controlled at the lower level.

# MATRIX OF ABC/ VED ANALYSIS

There can be combination of these two categories like a matrix combining ABC and VED categories. This matrix is more relevant in the hospitals. The AV category becomes the most important for inventory control because the items are very much cost consuming being a category and also vital for uses. These items can be controlled by the top-level management. The CD category items are not very costly and at same time of desirable category. These items can be controlled at the lower level.

|  |  |  |  |
| --- | --- | --- | --- |
|  | V | E | D |
| A | AV | AE | AD |

|  |  |  |  |
| --- | --- | --- | --- |
| B | BV | BE | BD |
| C | CV | CE | CD |

# CONTROL OF VED ITEMS

1. Category I items: these items are the most important ones and require control by the administrator himself.
2. Category II items: these items are of intermediate importance and should be under control of the officer in charge of the stores.
3. Category III items: these items are of least importance which can be left under the control of the store keeper.
4. The grouping will essentially depend upon the strategy of management and the environment of functioning. However these simple techniques can be effective in material management system.
5. Items with high criticality (V), but required in small quantity (A) should receive highest priority. Items with low criticality (D) and which are required in big quantity should receive least priority.

# PLANNING EQUIPMENTS AND SUPPLIES FOR NURSING CARE: UNIT AND HOSPITAL

## Material Management Cycle

Demand estimation Receiving & inspection

Stocking Inventory control Distribution

## Hospital Supplies and Equipments

Hospital supplies and equipments are dealt with under material management. Supplies are those items that are used up or consumed ; hence the term consumable is used for supplies. The supplies in hospital include drugs, surgical goods (disposables, g;lass wares), chemicals, antiseptics, food materials, stationeries, the linen supply etc. The term equipment is used for

more permanent type of article and may be classified as fixed and movables. Fixed equipment is not a structure of the building, but it is attached to the walls or floors.(sterilizer) Movable equipment includes furniture , instruments etc.

## Materials used in hospitals

|  |  |
| --- | --- |
| **Hospital material medical side**   * Perfusion material * Surgical disposables * Instruments * Drugs, medicine, oxygen, linen * Biomedical equipment * Disinfecting items * Computers, telephone and fax * Food and beverage materials * Anesthetic equipment * Electro medical equipment * Glass ware, dental machines * Surgical dressing utensils * Artificial limbs,bandages, cots for patient, furniture * Engineering items and many others | **Hospital material management side**   * Computer, fax, telephone, stationery items * Public address items overhead projector * Audiovisual systems |

**Purchase of supplies and equipment**

The purchase of equipments and supplies in a hospital is carried out through:

1. General store
2. Dietary department and
3. Pharmacy department

When planning for the purchase of articles, budgeting is done not only for the actual price of articles but also for the additional costs that are involved such as :

* + Transport charges (local delivery reduce the transport charge)
  + Incidental costs
  + Cost of chemicals and other consuable to be used with the equipment(eg; ECG paper for an ECG machine)
  + Operating costs(hiring a technician)
  + Cost of maintenance service; 10-20% of hospital equipment may remain idle if serving is not done periodically.
  + Cost of technology obsolesces: When a better quality appears in market there is tendency to discard the old model.
  + Replacement cost of equipment

## Selection of article:

While buying articles it has to meet the standards. Indian Standards Institution is the national agency set up to bring standardization of articles in India. Articles that meet the criteria specified by the Indian Standard Institution will be marked by ISI markings. The articles bought should safety to the patient and personnel. Faulty instruments and equipments cause not only inconvenience in the patient care, but also it may cause the loss of life.

## Purchasing article:

* + - The material used for any equipment should be durable, non-corroding, non- toxic and safe for use.
    - Should have standard shapes and dimensions to fit into various situations
    - Reparability and spare part availability of the article
    - Interchangability of the article
    - All surgical instruments used in a hospital should be sterilisable and they should stand the tests for leakage, hydraulic pressure tests for bursting etc
    - Should have accuracy in measurements
    - Should have ease of operation

## The central supply service

Most hospital have a central department where equipments and supplies are stored and from which they are distributed to the units. The type of materials that is kept in the central supply room varies from hospital to hospital . OIn some hospital the central soppy room deals only the sterile supplies and ward trays. In other hospitals all types of equipment such as oxygen, suction, ward trays, catheters, syringes etc are stored here.

## Linen supply:

Methods of handling linen supply include:

1. Departmentalised system
2. Centralised linen supply

## General utility services in the hospital

1. Electric supply and installations
2. Water supply
3. Disposal of waste –liquids and solids
4. Refrigeration , air conditioning, ventilation and environment control
5. Trasport
6. Supply of medical gases, compressed air, hot water, vacuum suction and gas plants
7. Laundry
8. Fire –hazard
9. Communication
10. Repairs workshop.

## Essential equipments for a 50 bedded district hospital(WHO)

1. **Scope of services**
   * Essential clinical services- medicine, surgery, paediatrics, OBG, and acute psychiatry( when necessary)
   * Optional clinical services – Oral surgery, orthopaedic surgery, otolaryngology, neurology and psychiatry
   * Essential clinical support- anaesthesia, radiology and clinical laboratory
   * Optional clinical support services- pathology and rehabilitation including physiotheraphy.

## Essential medical equipment

* + Diagnostic imaging equipment –It includes x-ray and ultrasound equipment. X-ray equipment can be stationery in one room or mobile.
  + Laboratory equipment-
    - Microscope
    - Blood counter
    - Analytical balance
    - Calorimeter
    - Centrifuge
    - Water bath
    - Incubator/oven
* Refrigerator
* Instillation and purification apparatus

## Electrical medical equipment

* + Portable electrocardiograph
  + Defibrillator(external)
  + Portable anaesthetic unit
  + Respirator- it should be applicable for prolonged administration during post operative care.
  + Dental chair unit- a complete unit should be available to carry out standard dental operations.
  + Suction pump- one portable and one other suction pump are required.
  + Operating theatre lamp- one main lamp with at least 8 shadows lamp and an auxillary of 4 lamp units.
  + Delivery table-it should be standard and mainly operated.
  + Diathermy unit- a standard coagulating unit which is operated by hand or foot switch, with variable poor control.

## Other equipment

* + Autoclave – for general sterilization
  + Small sterilizers- for specific services.eg. Stabiliser
  + Cold chain and other preventive medical equipment
  + Ambulance

## Small, inexpensive equipment and instruments

* + Equipment and instruments, such as BPapparatus, oxygen manifolds, stethoscope, diagnostic sets and spotlights.

# 6. PLANNING SUPPLIES AND EQUIPMENTS DURING EMERGENCIES AND DISASTER

## Introduction

Emergency preparedness planning requires a wide variety of supplies, equipment and resources, including personal protective equipment (PPE), decontamination equipment, and training. Planning should include collaborating with local emergency planning committees, local/state public health departments, and area hospitals to determine the supplies, equipment, and resources each healthcare facility needs to handle a disaster.

Basic emergency planning for supplies does not mean stockpiling within the facility. A taskforce with representatives from the Association for Healthcare Resource & Materials Management (AHRMM), the Advanced Medical Technology Association (AdvaMed), the Health Industry Distributors Association (HIDA), and other key organizations has persuaded federal agencies to use existing supply channels, rather than facility-level stockpiles, to support hospitals in an emergency. The consensus among hospital and industry groups is that the medical supply chain is capable of providing emergency responders with the necessary tools in the event of a disaster, and that relying on existing supply channels for emergency preparedness is a better solution than facility-level stockpiling.

## Products and contracted suppliers

Many products generally available and routinely used in healthcare facilities may also be used in emergency preparedness/safety planning. Other specialized items – for example, Level C equipment like powered respirators – are used primarily in emergency preparedness. The [Safety Institute's emergency preparedness products file](http://www.premierinc.com/safety/topics/lists/downloads/Emergency-Prep-product-supplierList-Nov09.xls), lists products and equipment that may be considered when developing an emergency preparedness supply inventory. This file is intended to serve only as an example and may not include all items and contracted suppliers that should be considered.

## Products and equipment for emergency preparedness

Healthcare facilities purchase many of the supplies and materials needed for safety and emergency preparedness on a regular basis from a variety of companies. Some of these routine supplies may also be designated for a disaster supply inventory. In addition, emergency preparedness requires specialized equipment and supplies. Many companies with comprehensive emergency-preparedness, safety-related equipment offers catalogs, some of which are available online.

## Product categories

The following table provides some sample categories and subcategories of search terms that may be useful in locating specific healthcare products, equipment, and training services for emergency preparedness.

## General Considerations in material management during disaster:

1. **Supplies and Equipment:**
   1. Extra supplies will be obtained from purchasing personnel through runners.
   2. Outside supplies will be ordered by the Purchasing Director and brought into the hospital via the loading dock.
   3. Be responsible for setting up extra beds in hospital if needed, as well as transporting storeroom supplies and bringing in extra supplies from other areas.
   4. Be willing to help with movement of victims from ambulance to Triage.

## Materials Management - Purchasing

* 1. Department Head or designee will call in their own personnel as needed after reporting to Command Center.
  2. Be prepared to supply all departments with needed supplies.
  3. Director will designate assistant to supply runners or volunteers to deliver supplies.
  4. Have an up-to-date list of suppliers who can quickly supply extra materials.
  5. Have Kardex in Storeroom up-to-date.

## Valuables and Clothing:

* 1. Large paper or plastic bags are available in the treatment Areas and the storeroom for patient's clothing and valuables.

## Housekeeping and Laundry

* 1. Department head or designee will call in their own personnel as needed after reporting to Command Center.
  2. Be sure all hallways or traffic areas are clear of cleaning carts, equipment and etc.

## Operating Room, CSR, PAR, Anesthesia, & OP

* 1. Check area for supplies and equipment.
  2. Keep minimum list of supplies on hand and be prepared to process additional sterile supplies quickly.
  3. Notify anesthetists who will maintain adequate anesthesia and drug supplies.

## Hospital Unit - Supervisor will:

* 1. Prepare for expansion by notifying maintenance of number of extra beds needed and where to set them up.
  2. Send for extra supplies needed from Purchasing, CSR, Laundry, and Dietary.
  3. Will make wheelchairs available.

## Laboratory

* 1. Have arrangements made to obtain additional blood, equipment and supplies from area agencies.

## Pharmacy

* 1. Report to Command Center, and then remain in department.
  2. Have list of drug suppliers that can provide emergency supplies quickly
  3. Keep minimum supply of emergency drugs on hand at all times.
  4. Pharmacy should remain open and have a runner to deliver needed meds to areas.

## j. Respiratory Therapy

1. Keep adequate supply of bubblers, cannulas, masks and flow meters available in Respiratory Therapy Department.
2. Be prepared to obtain additional respirators and equipment as needed.
3. Keep resuscitation equipment in good operating condition and well marked.

# INVENTORY CONTROL, CONDEMNATION AND DISPOSAL.

### Definition Of inventory control:

Inventory: inventory is the list of moveable items which are required to manufacture a product or to maintain equipment. Inventory is a unique item having identification number, nomenclature and specification.

Following are the types of inventory:

* + Raw materials
  + Components
  + Work in progress
  + Finished goods

## The inventory is basically of two types:

**Official inventory:** the materials lying in the main store s and being accounted for but have not been issued to the user units.

1. Medical and surgical items
2. Dressings
3. Linens
4. X-ray supplies
5. Laboratory supplies
6. Housekeeping items
7. All processed sterile items

**Unofficial inventory:** the materials have been issued to the user units like the dispensary, CSSD, laundry, wards, OPD, cast rooms etc. In case of forecasting or demand estimation,

these items are not taken into consideration by the hospital administration, so it is called as un-official inventory for hospitals.

### 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.

### Concepts relevant in controlling inventory costs:

The following concepts are relevant in controlling the inventory costs:

* Periodic/ cyclic system: this system involves review of stock status at periodic/ fixed intervals and placement of orders depending on the stock on hand and rate of consumption. The ordering interval is thus fixed but the quantity to be ordered varies each time.

* Two bin system: it is a system where the stock of each item is held in two bins, one large bin containing sufficient stock to meet the demands during interval between arrival of an order quantity and placing of next order, and the other bin containing stocks large enough to satisfy probable demands during the period of replenishment. When the first bin is empty, an order for replenishment is placed, and the stock in the second bin is utilized until the ordered material is received.

* Lead time: this is the period required to obtain the supply once the need is determined. It is therefore the average number of days between placing an indent and receiving the material. Lead time is composed of two elements: administrative or buyer‟s lead time (i.e. Time required for raising purchase requisitions, obtaining quotations, raising purchase order, order to reach supplier etc) and delivery or supplier‟s leading time ( i.e. Time required for manufacture, packing and forwarding, shipment, delays in transit)

* Minimum/safety/ buffer stock: this is the amount of stock that should be kept in reserve to avoid a stock-out in case consumption increases unexpectedly or in case the lead time turns out to be longer than normal. It is also the level at which fresh supply should normally arrive, failing which action should be taken on an emergency basis to expedite supply and replenish the stock.

Safety stock = maximum daily consumption-average daily consumption x total lead time

* Maximum order level: this is the maximum quantity of the materials to be stocked, beyond which the item must not be in the inventory. If the inventory is maintained beyond this point, there would be loss to the hospital by way of expiry of life items beyond the shelf life of items, loss incurred on the capital locked up in the inventory, unnecessary use of items just to exhaust the inventory.

* Re-order level: this is the value which is very important from the point of view of the inventory control. This is the point at which we have to place an order for procurement for replenishing the stock. It is derived by the formula (minimum order level + buffer stock )

### Costs:

1. Ordering costs: this is the cost of getting an item into the store. The process of ordering starts with raising requisition, placing an order, follow up, transportation receipt and inspection, acceptance and placing in stores.
2. Carrying costs: this is the cost of holding an item in the store till it is issued out or sold. Following are the elements:-
   * Interest on capital cost incurred.
   * Cost of obsolescence, wastages, damages.
   * Rent, insurance, depreciation and taxes
   * Maintenance costs of inventory like special treatment, stock taking etc.
   * Operating costs of store like direct labor and overheads like electricity, dust proofing etc.
3. Shortage costs: these are the costs incurred both directly and indirectly due to shortages like intangible costs due to loss of goodwill, opportunity loss or production hold costs.
4. Total inventory cost: A total inventory cost consists of carrying costs and ordering costs.
5. Lead time: this is the time which has elapsed between placing an order till the same items are received, stocked and ready to use.

### Average inventory:

Average inventory is defined in two cases:

* Average inventory at constant usage rate:

Average inventory = opening stock+ closing stock

2

* Average inventory at variable usage rate:

* Simple average method:

Average inventory = opening stock+ closing stock

2

* Six monthly average method:

Average inventory= opening stock+ stock after 6 months+ closing stock

2

* Quarterly average method:

Average inventory = sum of 4\_- quarterly stock + closing stock

5

* Monthly average method:

Average inventory = sum of 12\_- quarterly stock + closing stock

13

### Selective inventory control:

Definition: selective inventory control means grouping the inventory and classifying for the purpose of applying the right type of control based on their costs and functional importance.

Objective: the primary objective of inventory control is to minimize total cost of inventory. It requires the following

* Supervision on planning and control of inventory functions like forecast of requirements
* Purchase quantity fixation
* Storage and supply

Need for selective inventory control:

* Inventory consists of many items, in which some are costly whereas some may be not. * Some inventories are required in large quantities whereas some are required in limited quantities, thus each item require different type of control, some tight and some loose.

Methods of selective inventory control:

Following are the popular methods of selective inventory control:

1. ABC analysis
2. VED analysis

### CONDEMNATION & DISPOSAL

The materials which could not be used within its shelf life, deteriorated and declared unfit for use, became obsolete or banned due to legal provisions are considered for condemnation or disposal.

Criteria for condemnation:

The equipment has become:

1. Non-functional & beyond economical repair
2. Non-functional & obsolete
3. Functional, but obsolete
4. Functional, but hazardous
5. Functional, but no longer required

# PROCEDURE FOR CONDEMNATION

Following procedure is generally carried out in case of the materials particularly drugs and non-drug items:

* + A condemnation committee comprising of three or more members is constituted by the competent authority, the terms of reference of the committee are:

1. To go in details of the reasons as to why this situation has occurred.
2. The people who are responsible for the lapses on the aspects from acquisition to storage and distribution of materials.
3. To suggest measures to be taken for disposal of the items.
   * The committee members go into details through inventory records right from the point of demand estimation to the distribution level of materials, and will find out reasons for being an item surplus and remained unused.
   * The committee will declare the items condemned and make recommendation for further disposal of items.
   * The condemned items are to be destroyed, so it is to be taken out from the inventory registers, a write off sanction of the competent authority is obtained before final disposal.
   * The items particularly medicines which are toxic and cannot be disposed of by burial or as per the relevant laid down rules under the subject of waste disposal.

The effective measures are taken for disposal of surplus items before it becomes unfit for use is:

 A list of surplus material is circulated among the hospital staff/user units requesting them to pay special attention for mobilizing such items and giving priority to this category of items.

 The surplus materials are transferred to other hospitals where these may be required.

 The surplus materials are offered to the manufacturer/ suppliers for buy back.

 In case of materials other than drugs like equipments, instruments any such articles are treated as salvage or scrap, whatever the case may be, action is taken accordingly:

* + - The materials may be sold by inviting tender.
    - Open auctions of items through authorized auctioneers.

# METHODS TO EVALUATE THE EFFECTIVENESS OF MATERIAL MANAGEMENT:

1. **Supply performance review**: This reflects how well material management is meeting the needs of the hospital and individual departments in terms of availability of materials, quality of materials supplied and stock outs. Specific performance standards need to be set up in advance. Review of actual versus standards should be carried out at least once a year.
2. **Supply price comparison:** Price variation for the same product can occur because of greater volume of purchase by a hospital, distance of the hospital from the supplier, negotiation of the purchaser or by prestige or reputation of the hospital. If a supply price comparison is carried out across hospitals, it is possible to identify purchases that have paid high price, average price or low price for identical items.
3. **Management Audit:** The stores – purchase department can set up objectives for itself in terms of recommended material management, practices, a plan of action and persons responsible for the action. These objectives may relate to material administration, purchasing, receiving, storage and issues of materials.
4. **Material- cost-per- patient-day formula**: The MCPPD formula involves dividing total material costs per day by total hospital patient‟s costs per day and projecting a ratio of material costs to hospital costs. Such a formula compares universally across hospitals

irrespective of size, location, age etc as the factors that make the patient per cost increase vice versa. The MCPPD formula is probably the most objective and reliable method of evaluations the effectiveness of material management techniques.

## Product evaluation committee and role of the nurse manager:

A product evaluation committee is a multi disciplinary group in the hospital responsible for evaluating and selecting new products for use. Members usually include representatives from material management, nursing, medicine, biomedical engineering and education. Departments that use high values of equipment such as surgery, IV therapy, cardiac catheterization, laboratories, and central supplies, should have representatives as well. This diversity of membership provides the necessary perspectives that pull together the technology and tools of the trade with the human care giving provided in hospitals.

To ensure appropriate levels of nursing input in to product evaluation process, another alternative is to have a nurse assume the role of products nurse specialist. This products nurse specialist is responsible for coordinating all evaluation, education, and problem resolution with products in the clinical setting. She works closely with the hospital product evaluation committee. Whatever strategies are undertaken, it is essential to link the use and purchase of health care technology with the nursing practitioners providing the patient care.

## Hospital policy and the nurse manager

Nurse Managers as one of the interested constituencies in the hospital capital acquisition process should become educated about what capital expenditure is and, specifically how the hospital undertakes this process. When making capital requests, nurse managers need to thoroughly analyze and justify the necessity for expenditure.

They should provide detailed explanations of,

* + Benefits of the purchase
  + Cost of the implementation or change
  + Long term effects of the project.

# NURSES’S ROLE IN MATERIAL MANAGEMENT:

A ward is often referred to as a nursing unit. This implies that a ward is actually under the control of the nurse incharge for its maintenance and for running its day to day patient care activities. Material management consequently is an onus that lies on the nurse in charge as well on all members of the nursing team. The nursing responsibilities in relation to material management are listed below.

1. Ensuring regular and adequate flow of supply of necessary equipment, supplies, drugs and solutions
2. Monitoring and sustaining the quality and safety of the materials used including drugs and solutions. Issuing of items on the bases of “first in first out” and regular checking of expiry dates of drugs contribute, towards safety.
3. Indenting, receiving, storing, checking and timely replenishing of all necessary equipment, supplies, drugs and solution.
4. Maintaining of emergency and buffer stocks.
5. Arranging for preventive maintenance wherever necessary.
6. Maintaining inventory and stock of all items and supplies
7. Arranging and assisting in audit of materials
8. Arranging for condemnation of articles in accordance with the laid down policies of the organisation and maintaining of a dead stock register.
9. Participating in the policy making for material management.
10. Participating in tender/ procurement sub-committees.
11. Orienting nursing personnel on material management policies from time to time.
12. Evaluating the efficacy of the material management system followed in particular nursing unit

# CONCLUSION

Material management is an important management tool which will be very useful in getting the right quality and right quantity of supplies at right time, having good inventory control and adopting sound methods of condemnation and disposal will improve the efficiency of the organization and also make the working atmosphere healthy any type of organization, whether it is Private, Government, Small organization, Big organization and Household..

The nurse manager is in a pivotal role in the hospital to combine clinical expertise with financial and business skills to make effective decisions related to resource allocation and material management. Since nursing has such a central coordinative function for patient care in hospitals, it is appropriate for nurse managers to promote high quality patient care through the provision of safe , effective equipment and technology.

## References :

1. Basavanthappa B T. Nursing administration. ( Ist edn). New Delhi: Jaypee brothers medical publishers (p) ltd; 2000.
2. Gopalakrishnan & Sunderasan: Material Management, Prentice Hall of India Pvt Ltd. New Delhi, 1979.
3. Kulkarni G R. Managerial accounting for hospitals. Mumbai: Ridhiraj enterprise; 2003.
4. Kumar R& Goel SL. Hospital administration and management. Vol 1 ( first edn).New Delhi: Deep & deep publications;
5. Gupta S& Kanth S. Hospital stores management, an integrated approach.( First edn). New Delhi: Jaypee brothers; 2004..

# 8. EQUIPMENT AND SUPPLIES OF NURSING EDUCATIONAL INSTITUTIONS INTRODUCTION

A Well functioning equipments and adequate supplies are necessary for the smooth functioning of any educational institution. Insufficient and ill functioning equipment results in increased work and waste of time. Physical facilities such as class rooms, laboratories, library and office are the fundamental requirements of any educational institution and without them; it is difficult carry out on a sound educational basis.

# MEANING OF EQUIPMENT

Things used in equipping or furnishing.

Equipment includes more permanent articles and may be classified

1. fixed
2. movable

# FIXED EQUIPMENT

Fixed equipment is not a part of the structure of the building but is attached to its walls or floor such as sterilizers, syringes etc……..

# DEFINITION OF SUPPLIES

Supplies are expenditure items or those articles, which are used up and must be recorded periodically.

eg: sterile goods stationery items.

# PSYSICAL FACILITIES IN THE SCHOOL AND COLLEGE OF NURSING

* 1. **OVERALL REQUIREMENTS**:

Physical facilities such as classroom, such as classrooms, laboratory, library and office are a fundamentals requirement of any educational institution and without them it is difficult to carry out a programme on a sound educational basis. The amount of accommodation necessary depends on the number of staff and students, but the minimum desirable for a school/ college of nursing with 50 students or less is listed below.

For 50 students or less, there should be

* + 1. 2 classrooms [with movable partitions if no assembly half is available.
    2. 1 multi- purpose laboratory [ demonstration room and nutrition laboratory]
    3. 1 science laboratory
    4. 1 office for senior tutor or head of school, if it a separate post
    5. 2 offices for other staff
    6. 1 office for clerk- cum- typist
    7. 1 library
    8. 1 large storeroom
    9. waiting hall or room for visitors
    10. sanitary facilities

# CLASSROOMS

## Number

The number of classrooms should be sufficient to permit the scheduling of classes in keeping with educational principles and at hours, which are convenient to the tutor, and students. One class room should be capable of seating the entire student body, unless there is an alternative arrangement for large gatherings. This purpose may also be served by dividing one large room into two or even three smaller rooms by the use of movable partitions, which should reach from floor to celling to minimize noise and other distractions.

## Size

The size of the classroom will depends on the size of student body, but they should comfortably seat. The total number of students in the largest class normally admitted. Each class room should be aesthetically pleasing, should have good lighting, be well ventilated and provide for heating or cooling. Depending on doors and all other apertures should be find with wire netting.

## Furnishings and equipment

There should be a separate chair and desk or chair- cum- desk for each student or alternatively sufficient room for each student to sit and write, so that arrangement is possible for group discussions.

In addition to fixed blackboards, there should be a movable blackboard for each room, or at least one for every two rooms. Bulletin boards and other facilities for displaying material should also be available. There should be a wash basin with running water or other suitable hand washing facilities. It should be possible to shade the widows in hot weather and to have some convenient arrangement for darkening one room for the showing of films.

# LABORATORIES

Three main types of laboratories or work room are required for demonstrations and practical classes- a science laboratory, nutrition laboratory and nursing arts laboratory or demonstration room.

# SCIENCE LABORATORY

The extent to which a science laboratory is necessary and is utilize will depend on the arrangement made by school for the teaching or science subjects. Anatomy and physiology, physics and chemistry and microbiology are all subjects which require laboratory facilities, and it is probably more convenient to have these available in the school. However, a school may arrange to uses the laboratories in the hospital, medical college or local science college, if the arrangement is satisfactory, convenient and permanent, in which case, the construction of science laboratory in the school will not be necessary.

The science laboratory should be fitted with benches and seats, cupboards, running water and either piped gas or cylinder, and should have microscope, balance and weight and such other equipment and supplies as are required for the subjects being taught.

# NUTRITION LABORATORY

The nutrition laboratory must have facilities for imparting basic knowledge about food and for practice in cooking food for the normal as well as invalid. the furnishings and equipment therefore should include work benches[ with stainless steel, marble chip or heat- resistant tops] electric or gas or an indigenous type of cooking stove, sinks and running water, dietetic scales, cooking utensils, shelves, and cupboards for storage.

If a separate room is not available, the nutrition laboratory may be incorporated with the nursing arts laboratory, if large enough and if the time table can be so arranged that the two will not be in the same time.

# NURSING ARTS LABORATORY

The nursing laboratory or demonstration room is used to varying degree by teaching staff for the demonstration of some of the techniques used in the nursing, but it is essentially a work room for the students. Like the library, it should always be accessible to students when not in use for formal classes, so that they may practice and familiarize themselves with nursing procedures and equipment according to their individual needs. It should have ample cupboard space, shelves, sinks and running water, tables or work benches and movable chairs. There should be adequate storage space, with protection for perishable goods from heat, moisture, insects and vermin. There should be easy access to equipment and supplies.

Equipment should be selected not only with the cost in mind but on the basis of its usefulness, and durability and it should be keeping with what is commonly used in the hospitals and community. Where more than one nursing programme is being conducted expensive type of equipment should be shared by the various teaching programme.

# MCH LABORATORY

All the equipment should be equipped with the maternal and child health nursing, all the specimens, all the instruments should be sufficient

# COMMUNITY HEALTH NURSING LABORATORY

Community lab should equip with sufficient models, bags, all the necessary articles for practicing the students**.**

# OFFICE

The teaching staff of discharge the function expected of them, office accommodation, which will permit uninterrupted work and ensure privacy for conference and discussions with the students and with the other staff. Preferably there should be a separate office for each tutor, until such time as this possible there should be a minimum of one office for the senior tutor and one office to be shared by the others. A separate desk should be provided for each tutor.

The furniture and the equipment in each office should include the following quantity consistent with the number of staff:

* + 1. desk and chair [ with additional chair for visitors]
    2. steel cup board with lock
    3. filing cabinet
    4. book case
    5. Stationary rack, filing trays, table lamp, stapling and punching machine and other desk equipment.
    6. Bulletin board and pegboard.
    7. waste paper basket
    8. Room heater and / or cooler is required.

Additional equipment which may be used jointly or supplied for each each staff members

* + - 1. graphdex type of board
      2. telephone

In addition to the equipment supplied for teaching staff, the following additional equipment should be provided for the office of the clerk

* + - * 1. type writer and typing – table
        2. duplicating machine

# LIBRARY

A good library makes an immeasurable contribution to an educational programme and the teacher serves her student‟s best who, early in the course introduced them to its use. It not only opens to the door to knew knowledge but stimulates critical thinking an helps to develop independence in seeking and obtaining information. An up to date, varied sections of books and other library materials also encourage and assists the staff in study and research both for self improvement and for the benefits of the students.

In some institutions there may be a combined library for the use of medical and surgical nursing staff, but more frequently the school o nursing will have its won. This should not, however, prevent students and staff from making use of the hospital, medical college, or public library‟s, and where such facilities are available their location and regulations should be made known

# ACCOMMODATION AND EQUIPMENT:

The library should be conveniently located as far as possible quit, attractive surroundings. the size will depends on the number of persons for whom its caters, but it should be larger enough to permit the proper arrangement of books and to seats approximately half the largest number of students usually admitted to a class . Where space permits, it is preferable to have a reading room annexed where students may study with minimum of distractions. Adequate ventilations and good lighting, both natural and artificial, are essential.

The furniture and equipment should include:

* + 1. comfortable chairs, and tables of a convenient height
    2. metal books shelves or cup boards with glass doors
    3. boxes for pamphlets
    4. catalogue cabinets
    5. bulletin boards
    6. book display racks
    7. steel book support
    8. magazine display racks, preferable with space for back members
    9. transparent magazine covers
    10. stationery items such as index cards, borrowers cards, table and register

# ORGANIZATION OF LIBRARY

To obtain the maximum benefits from the library facilities, 4 conditions are necessary:

* + 1. there should be one person responsible for it
    2. there should be committee advise on it
    3. there should be policies to regulates its use
    4. there should be a budget

# LIBRARIAN

The management of library requires special knowledge and skills and a school of nursing with a full time or part time librarian undoubtedly benefits from such a services. Where no such provision is made, it is possible to operate a small library quite effectively when an interesting staff members accepts the responsibility. She may be guided initially by librarian and assisted by the library committee.

# LIBRARY COMMITTEE

The membership of the library committee should include the librarian as secretary, and a tutor, nursing sister, a student and any other members of the staff.

# THE FUNCTIONS OF THE LIBRARY COMMITTEE ARE

* + - 1. preparing the initial budget estimate , and reviewing them periodically
      2. selection of new books
      3. selection of magazines
      4. formulation of the policies regarding the use of the library
      5. studying and reporting on statistical data on the extent to which the library is being used
      6. encouraging the use of the library

The selection of books for purchase is generally done in consultation, with or on the recommendations of the nursing staff. Publishers, catalogues, review in journals and

advertisements furnish information regarding publications, and it may be possible to have some of these reviewed by appropriate members of the college or hospital staff before purchasing them. The library committee should also make it responsible for arranging for translations of extracts where there is a need

# POLICIES

Certain policies will have to be formulated so that the library may operate efficiently and in a manner convenient to the majority of those using its facilities. Some of the matters concerning which it is advantages to have policy are

* + - 1. the hour at which the library will be open
      2. the person who may use the library facilities
      3. the kind of books and journals which will be stocked
      4. the books , which may be borrowed and those , which must be read in the library
      5. the period for which a book may be borrowed
      6. the action to be taken when books are not return on time
      7. the percentage of the bug jets to be spent on subscription to journals
      8. the journals to be bound

# BUDGET

When setting up a new library or reorganizing an old one, a non recurring budget will be required for furniture and equipment and for the purchase of some well – selected books to serve as nucleus around which the library will be built. The budget require depends up on the needs of the educational institutions, but it should be ample enough to furnish, equip and maintain the library so that it may function effectively. a minimum initial out lay of 5000/- would help to start a library for a small school, with an annual recurring budget of at least 1000/- for five years until the library is established. There after it may be possible to reduce the amount some what , but it should be remembered that the library should have a amount some what, but it should be remembered that the library should have a reasonable number of current publications and that old editions must periodically be replaced. The items on which the annual budget should be estimated would include:

* + - 1. The e purchase of new books, pamphlets, reprints etc…
      2. subscription of journals
      3. binding of volumes of journals at the end of the year
      4. Stationary items etc…..

# LIBRARY HOLDING

The number and variety of books and other materials in the library will be determined by the objectives of the programme and by the needs of the needs of students. Where it is not practicable or advisable for the students to have there own copies of text books, the number in the library will have to increase accordingly. The library may stock any or all of the following variety of publications.

* + 1. Dictionaries eg: English, Hindi, and local regional languages, nursing, medical.
    2. Encyclopedias, directories, charts and maps
    3. Bibliography of nursing publications and extracts
    4. Central, state and municipal government report and documents such as five year plans, statistical data and bulletins.
    5. Nursing textbooks and reference books on all aspects of nursing and related subjects.
    6. books on physical , biological and social sciences
    7. Books and materials on allied disciplines such as social work and occupational and physical therapy, and on the work of gram seamarks, auxiliary nurse and other health personnel‟s.
    8. Journals of nursing personal and other allied personals.
    9. current pamphlets in all related Ares
    10. monographs, reprint of articles from journals
    11. daily news papers
    12. Selected biographical, philosophical and religious books.

# ORGANIZATION OF BOOKS

Printed material related to nursing is varied, multitudinous and scattered and some organization of the material in the library is required if the information available is to be made known and easily accessible to those who use it

# ACCESSION

The accession register contain all the details of addition to the library and their subsequent fate. this information may be recorded under the heading of data, serial number, author, title, publishers and place , year, pages, sources, cost, book number, when and how discarded and remarks.

# CLASSIFICATION

Books should be classified into selected groups, and even if the number is small, it is wise to start classifying from the beginning to avoid confusion later. According to the standards system of the classification books should be arranged.

# CATALOGUING

For nursing department s dictionary system of cataloguing should be sufficient. For this, each book require 2 cards

* One is subject card, another one is author. If library is small only one card is kept, a subject card is probably be the more useful. Standard catalogue card is obtained but 5X3 index cards may be adopted for use.
* Catalogue cards should contain information regarding the subjects, author, and title, date of issue, publishers, classification and accessory number as illustrated.

SUBJECT CARD AUTHOR CARD

Cl . No Ac. No

Subject

Author

Title -

cl. no

Ac no

Author

Title

Date of issue

For cataloguing selected articles form the journals the card should contain additional information regarding the name, volume, and number of the journal, the page reference and the e brief description of the tool.

# BORROWING

A card system can used to keep a record of books borrowed. Each book required two cards, which are kept pocket inside the front or back cover. The card should contain the information regarding author, title, and classification and accession number and should have space for writing in the date borrowed and name of borrower.

# OTHER PHYSICAL FACILITIES

**HOUSE KEEPING ROOM**

The school or college building should be a room for the use of housekeeping. The room should contain

A sink with running water

shelves for storage of cleaning equipment and supplies

a table and chair

a cupboard for personal belongings

facilities for resting for nonresident staff

a sanitary annex including bathing facilities and latrine

# STORE ROOM

The college should have storage space for equipment and supplies. The store room should be easily accessible, should be protected from the weather and should have enough cupboard and shelf for the proper maintenance of articles.

# SANITARY ANNEX

There should be hygienic hand washing and latrine facilities for both staff and students with convenient to the class rooms and office.

# OTHER AMENITIES 6.4.1DRINKING WATER

The school or college should have facilities for the provision of cold drinking water. If there are no drinking fountain or running water, an adequate supply of safe drinking should provided in hygienic conditions

# 6.4.2 REFUSE DISPOSAL

There should be proper arrangement for the collection and disposal of refuse.

# HOSTEL

The hostel may or may not be located in the same building as the college, if it is separate, it should be within a convenient distance. When new buildings are to be erected or old one is altered, the head of the college should be consulted at the planning stage, and the facilities provided should be the equilent to those provided entering comparable professionals.

# POLICIES

1. The management of the hostel will be affected by the policies adopted by the school in regards to the following
2. The number of the staff to be resident and weather married quarters are provided
3. Arrangements for students to receive visitors.
4. Mess arrangement for students and staff.

# ACCOMMODATION

The minimum accommodation, which is required in the hostel, is listed below

bed room for students

suits for staff and for the warden

sitting room

reading- cum study room

recreation room

visitors room

kitchen room

store room

dining hall

wardens office

health room

laundry for use of students

pantry for use of students

store room for linen and supplies

luggage room

room for house keeping staff

cycle and bike shed

sanitary annex

# STUDENTS ROOM

The accommodation which is provided should permit each student to have privacy if and when she wants. Guidance on the standard size of rooms is usually available from the bodies such as university grants commission in India, but single rooms should not be less than 100 sq: ft , and double rooms 150 sq:f t with a minimum of 75 sq. ft per student in large rooms .

For reach student there should be comfortable bed, a cup board with hanging and shelf space, a dressing table with mirror and a table and chair , bed linen should be supplied , and there should be curtain on windows and doors, ceiling fans , windows should covered with netting , or mosquito net should be supplied. There should be a separate accommodation for the students on night duty.

# STAFF SUITES

The accommodation provided for staff may vary according to the grade and marital status. Married quarter should consists of the numbers and variety of rooms commonly provided in the locality to those of comparable ranks , and for staff without families there should be sitting room, , bed room , a bath room facilities and pantry for each or one which can conveniently be shared .

# COMMON ROOMS

In the hostel there may be a large sitting room or two or more smaller ones, depends on the number of students, but the combined accommodation should provided for seating.

There should be a separate room where students may read or study with a minimum distance. It should have table, comfortable chairs.

Other room for recreation which contains radio, record player, table tennis, and facilities for other games.

# PANTRY

One each floor in the large hostel, at least in one convenient place in the small hostel, there should be a small pantry for the use of the students which facilities for making tea and hot drinks.

# HEALTH ROOM

There should be a health room on the hostel premises the services to be provided depends up on the condition.

# WARDENS OFFICE

This room should furnish and equipped as same way in the hostel, and there should be a telephone with an extension to each floor for the students and in addition for the public cal box for the use of the students.

# ROOM FOR HOUSE KEEPING STAFF

There should also be small room where domestic staff who are non resident may leave there belongings and there they may rest. It should have all the facilities

# STORE ROOMS

There should be adequate storage space for linen, domestic supplies. Extra furniture and the student‟s trunks. Store room should have shelves and cupboards.

# LAUNDARY

There should be facilities for students for washing cloths and drying and ironing of cloths. There should be adequate supply of water, and one iron box for 50 students. There should be laundry facilities for students.

# KITCHEN PRIMISES

The kitchen premises should include a kitchen, pantry, and store room. The kitchen should avoid from noises and smoke. There‟s should be adequate tables and sufficient supply of water for cooking purpose as well as hand washing and cleaning vessels.

# DINNING HALL

The dinning hall should be attractive, well ventilated and well lighted and should be within convenient reach of the kitchen. There should be a hand washing facilities to the dinning room. Meal time should be utilized for the helping the students develop social graces.

# SANITORY ANNEXES

Sanitary annexes should be provided on each floor either one central place or in travel between groups of rooms and should consists of at least 1 latrine and 1 bath room for every 5 students. In addition hand washing facilities and sufficient water should be provided for the students.

Clean safe and cool drinking water should be provided for the students in hygienic container

# OUT DOOR RECREATION

The grounds of the students should be large enough to provide students may relax with a degree of privacy. Sufficient place and facilities for out door games such as badminton, tennis, and basketball should either be available within the school or hospital grounds or readily accessible in the community.

# CONCLUSION

In order to meet educational objectives of the nursing programme, there should have an adequate supplies and equipments [physical facilities]. Number and type of physical facilities will depends up on the size of the student‟s body and the needs of the educational programme.

# BIBLIOGRAPHY

* + - 1. Indian nursing council, guide for nursing institutions in India. New Delhi, 1966. World health organization regional office for south East Asia. P.No 59-67.
      2. Jean barret, ward management and teaching. Second edition. Konark publishers, 2001: P.No: 146-48.
      3. Swan burg, nursing staff development. Second edition reprint, 2001, Boston publishers: P.No 27-28.
      4. BT Bsavanthappa, 1st edition, Jaypee publishers, P.No 450- 485.
      5. Mrs. Toglekar K.S professional adjustment and trends in nursing. 2nd edition , Bombay , vora publications : 2002: P.No 27-29