



Module 5: Chapter 4

Material Management



**Indian Association of Preventive and Social Medicine
Gujarat Chapter**

MACHINES & MATERIAL MANAGEMENT

Learning objectives: At the end of this unit participants would learn about...

1. Issues involved & Principle of material management
2. Store, repair & maintenance
3. Codification & classification of goods

The quality & delivery of health care depends to a large extent upon the proper management of biomedical equipment. Unfortunately this part has received less attention. Thus the urgent need is proper maintenance of biomedical equipment, over 60% of which are in unserviceable state.

Material (Logistics) Management

DEFINITION:

Logistics management is defined as *“the systematic and scientific process of planning, implementing and controlling the efficient and effective flow and storage of resources (goods & services) from point of origin to the point of consumption in order to meet the customer’s requirements”*.

Logistics management in a health care set up becomes essential to ensure procurement and provisioning of vital medical supplies at the correct cost, consistency in quality, low storage cost and high turnover of items.

In addition, logistics management also ensures proper forecasting & standardization of medical supplies and assists the manager in deciding whether ‘to make’ or ‘to buy’ a facility such as MRI facility to the patients.

One of the important components of logistics management is *materials management* which aims to “coordinate, supervise and execute the tasks of flow of materials to, through and out of an organization”.

It thus ensures a continuous supply of good quality material at the lowest possible price, at the same time keeping the inventory level to minimum so that working capital is not blocked in inventory but without compromising the operations due to shortage of inventory.

Material management is also known as logistics and supply management system. The word logistic has economic connotations. It is defined as the branch of military science concerned with procurement, transportation, warehousing purposes.

To give an analogue, the human body's logistics system is its circulatory system (blood), which provides oxygen and other essential nutrients to all the tissues to the body on round the clock basis. If any interruption/hindrances come in this system, it will have serious adverse effect on the entire human body. Similarly, health and family welfare institutions and hospitals have their own logistics supply system, which should provide all the essential drugs, vaccines, contraceptives and other consumables for effective and efficient delivery of health care. If there is any interruption, it will seriously dislocate the normal functioning of these institutions, besides, adversely affecting the patient care.

According to a survey of the department of electronics, government of India in the nine states of the country, it is revealed that at least 30-40 percent of costly high-tech bio-medical equipment, worth hundreds of crores of rupees is lying idle in hospitals. The main reason of this wastage is identified as lack of policy in the hospitals and health institutions on equipment management, maintenance and repair.

The expansion, modernization and sophistication of the health care delivery system and particularly the hospitals, demand the scientific management of the materials. Materials management is now well accepted as a quantitative technique of operations research and has been successfully employed in the industry. However, its application in the health sector of our country leaves much to be desired.

NIHFW has conducted two important studies in the states of Haryana and Madhya Pradesh, on the logistics and supply system of drugs, vaccines and contraceptives in the district health system. Both these states revealed that a drugs supply to the health institutions in districts follows more of the **PUSH SYSTEM** rather than the **PULL SYSTEM**.

If we analyze the budget of a district health organization or its hospitals, it will be seen that approximately 60-70 per cent of the budget of the expenditure is consumed on salaries and wages and the remaining about 30 per cent is consumed on the materials. So materials consumed nearly $\frac{1}{3}$ rd of the total expenditure. Most of it is consumed on drugs, vaccines, contraceptives, laboratory reagents and other consumables. The health administrator has to ensure the regular availability of all the vital and essential materials to avoid the stock out situation and hence causing disruption in health care delivery system.

Ordering equipment

Based on the requirement & past experiences equipments are to be ordered. This analysis if not done properly would result in wastage of limited resources. It is necessary to balance the requirements with the resources available so that one can remain within budgetary limits. This process can be facilitated with the help of catalogues, which are easily available & this would avoid the chances of forgetting important items. Finally an requisition form or order is formed.

Storage, Standardization, Codification & Classification

We know that many of the equipments needed in a hospital or health care set-up are either out of order or not available. Consequently this leads to insufficient utilisation of manpower & inefficient health services. Many of the bio-medical equipments used in health care settings are lying unserviced. There is no proper organisation & arrangements for care & maintenance of these costly equipments. At the same time with the development in health care sector newer medical equipment for diagnosis, treatment, prosthesis, life support system, etc have come up. The maintenance & utilisation of these equipments requires specialized knowledge & skills which few of the human resources have. Training of the human resource for this part lags behind the development in medical sciences. Technicians or engineers or staff who can maintain & use the equipment are needed or needs to be trained.

(a) The storage system : The main function of a storage system is to receive material, check it for quality and quantity, prepare the receipt vouchers, accept the inspected and passed material, undertake documentation for payment of bills, store the accepted material properly and safely, issue required material to various departments on requisition from them, prepare issue vouchers and account for them. Broadly any storage system in an organisation consists of the following sub- systems which work together to cater to the existing demands and also the further growth potential of an organisation:

- (i) Receipt system
- (ii) Maintenance & upkeep system
- (iii) Issue system

Controlling & maintaining equipment:

Most of the non-consumable items remain out of order for a long time. So there is a need to sensitise the staff in regular up keep of the equipment. Also immediate action needs to be taken for any mechanical defects identified in the equipment. In some cases it has been observed that the equipment has been intentionally kept in non working state so that patients can be referred to private practitioners.

For this purpose the following steps needs to be taken:

1. Convince staff about importance of cleaning & keeping the equipment in good order
2. Returning the equipment to its correct place after use
3. Use of an inspection check- list & inspection schedule
4. Detection of discrepancies & their causes

(b) Codification of goods: One of the basic requirements of an efficient stocking and logistics management system is an effective and scientific system of coding the items, to ensure quick tracing & retrieval and early identification of dead / duplicate stocks. In a health care setting, this task is more complicated since detailed characteristics and nature of large number of drugs available are required to be known for their coding and classification. Ideally, all health care stores should be classified in broad categories (such as pharmacy, X-rays, chemicals, laboratory items, waste disposal, ancillary items etc) and then grouped and sub-grouped logically according to functions and usage.

Various systems presently in vogue for codification are described as under:

- (i) *Alphabetical system* (Table - 1)

Table - 1

Class	Group	code
Patient bed (PB)	Iron(I), Hydraulic(H)	PB-I-H

- (ii) *Numerical system* (Table - 2)

Table - 2

Class	System	Generic name with strength	Family of drug	Condition
Drug (01)	Musculoskeletal (38)	Ibuprofen IP 400mg (08/4)	Tablet (1)	New (1)

In this example, the Code would be : 01-38-08/4-1-1.

(iii) *Combined alphabetical and numerical system* (Table - 3)

Table - 3

Class	Sub group I	Sub group II	Code
Ibuprofen	IP-400	08/4	IP400-08/4

(iv) *Other Systems* : These include the “*Brisch system*”, which is a complex and detailed system wherein a 7-digit unique number is allotted to each item based on its position and value; “*Kodak system*” which is based on numerical system and grouping done based on purchase category of the particular item, with 10-digits. Thus, the code allotted to an item may be depicted as 301-1234-123.

Accounting of Stores

Accounting of materials: It is essential that in order to demand the optimal material, the stock held with the stores must be accurately known and maintained. This is important to prevent over-ordering of material and is absolutely essential to avoid ‘stock-outs’, both of which are detrimental to functioning of an organisation. Thus, in order to continuously keep a track of the material available in stock, the following systems are adopted :- (i) Bin Cards show the daily receipt, issue and balance in hand in the form of cards attached to each bin / shelf containing the particular item. Bin cards can also be suitably and effectively modified to indicate the maximum / minimum permissible stocks and the re-order levels. (ii) Stock identification cards are identification cards for each item, with details such as material code number, description, ledger folio number etc, kept next to the bin/ rack in order to identify the item completely. (iii) Material requisition slip is a requisition for the type and quantity of material required by any department from issue counter. When maintained properly it accurately indicates the exact quantity and type of material issued to various departments for various purposes.

(iv) *Material received note* is a document through which the material received from a supplier is taken on ledger charge. Subsequently the accounts department, based on this document makes the payment to the suppliers.

(v) *Stores ledger* is a complete record of materials indicating the details such as suppliers’ details, price of the item, invoice / bill number and stock levels.

(vi) *Material return note:* Surplus material lying with various departments are returned to the stores through a ‘material return note’ which enables the stores to take this surplus material on ledger charge once again and to adjust their stock levels.

(vii) *Material transfer note:* Surplus material lying with one department may be transferred directly to another department in need of the same material through such a note, by informing the stores.

Concept of Flow of Goods and Stores Accounting

Flow of goods (issue of stock) is of utmost importance in any health care setup since the problems of obsolete items, expired medicines and old stocks are faced by every store keeper in a hospital. Such avoidable wastages not only increase the cost of managing a hospital but may also occasionally result in a fatality due to issue of expired and out of date medicine to a critical patient.

The following are some of the methods followed for flow of goods and stores accounting :-

(a) First In, First out (FIFO): Material from the oldest stock is issued first with the view to turnover the stock.

(b) Last In, First Out (LIFO): Materials which are received last are issued first in this case, but it usually results in poor inventory management and hence is generally not recommended in health care establishments.

(c) Specific cost method: Provides the most realistic valuation of inventory stock and physical stock-taking of stores can be done any time of the year. Under this method, values of the material charged off / taken on charge are identical to the material issued / received and hence is the most suitable method of maintaining stocks in commercial organisations.

(d) Average cost method: Average cost of each item issued from stores/ received at stores is assessed and this value is taken for maintaining the cost of inventory held by the organisation.

Though easy to follow, this method often leads to inaccurate values of inventory in the organisation.