“Education is a liberating force, and in our age it is also a democratising force, cutting across the barriers of caste and class, smoothing out inequalities imposed by birth and other circumstances.”

— Indira Gandhi
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CURRICULUM DESIGN COMMITTEE

Mrs. B. Bhattacharya
Principal, College of Nursing
Jamia Hamdard University
New Delhi

Dr. Bimla Kapoor
Reader in Nursing
SOHS, IGNOU
New Delhi - 68

Dr. Mridula Saikia Khanikar
Principal
Regional College of Nursing
Guwahati

Mrs. Usha Malik, Principal,
College of Nursing
Batra Hospital, New Delhi

Dr. A Bhaduri
Prof. & Head of PG Studies
in Nursing
Kasturba Medical College
Manipal, Karnataka

Mrs. Uma Handa
Consultant
UNICEF, New Delhi

Faculty SOHS, IGNOU
Prof. A.K. Agarwal
Director
Dr. Bimla Kapoor
Reader
Dr. Pity Koul
Reader
Mrs. Rita Sarkar
Lecturer (Sr. Scale)

BLOCK PREPARATION TEAM

Unit 1 & 2
Writers
Mrs. Urmil Bhardwaj
Reader, College of Nursing
Jamia Hamdard University
New Delhi

Editors
Lt. Col. Shobha Sood
Principal
AFMC, Pune

Unit 3 & 4
Writers
Mrs. Pannam Rana Devi
Principal
College of Nursing
CMC, Ludhiana

Editors
Mrs. Rita Sarkar
Lecturer (Sr. Scale)
SOHS, IGNOU
New Delhi

CO-ORDINATION

Prof. A.K. Agarwal
Director
SOHS, IGNOU
New Delhi-110 068

Mrs. Rita Sarka
Programme Coordinator
SOHS, IGNOU
New Delhi-110 068

PRODUCTION

Mr. Sunil Kumar
Section Officer (Pub.)
SOHS, IGNOU
New Delhi-110 068

Mrs. Promila Soni
Section Officer (Pub.)
SOHS, IGNOU
New Delhi-110 068

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A large variety and number of materials are used in hospitals. An average hospital needs more than 3000 items of instrument and equipment, this shows the type of stores used for patient care in the hospital and therefore the management and maintenance itself is very important. Materials management is an important aspect of resource management. When we talk about resource, it covers personnel, materials, money, time and environment. Proper management of materials is very crucial in all the organisations and you as a nurse play a vital role in controlling, maintaining and inspecting the materials from time to time for efficient and effective patient care. Material management is very important in nursing. All the nursing procedure starting from simple to complex, non-invasive and invasive techniques require materials. In other words no nursing procedure can be done in a scientific way without adequate and appropriate materials, material management includes economy of materials, prevention of wastage and recycling or reuse of materials whenever possible. Effective material management is primarily concerned with logistic management. As you know a lot of finance is involved in procuring the materials for patient care, therefore, it is extremely important to manage the materials efficiently, effectively and economically while providing nursing care.

Block 2 of course 4 is "Material Management". In this block we have covered four units of study as follows. Unit 1 deals with Introduction to Material Management, unit 2 deals with Storing and Issuing the Equipment and Supplies and unit 3 discusses about Controlling and Maintaining Equipment. Unit 4 deals with Managing Drugs. You as a nurse administrator is the key person who controls and maintains patient care activities. You along with your team is responsible for material management in the ward.
UNIT 1 INTRODUCTION TO MATERIAL MANAGEMENT

Structure

1.0 Objectives
1.1 Introduction
1.2 Definition
1.3 Importance of Material Management
1.4 Aims and Objectives of Material Management
1.5 Process of Material Management
   1.5.1 Budgeting and Materials Planning
   1.5.2 Demand Forecast
   1.5.3 Procurement
   1.5.4 Receipt, Inspection, Acceptance and Payment (Inspection and Quality Control)
   1.5.5 Storage
   1.5.6 Inventory Control
   1.5.7 Issue and Distribution
   1.5.8 Maintenance
   1.5.9 Disposal and Condemnation
1.6 Role of a Nurse in Material Management
1.7 Let Us Sum Up
1.8 Key Words
1.9 Answers to Check Your Progress
1.10 Further Readings

1.0 OBJECTIVES

After going through this unit, you will be able to:

- acquire knowledge about the importance of material management;
- explain the process of material management in terms of budgeting, demand forecast, procurement, storage, and inventory control; and
- able to function efficiently as material manager in a nursing unit.

1.1 INTRODUCTION

In this unit you will learn about the management of material, along with its process and the role of nurse in the management of material.

Material management is the coordinated function, responsible for planning, acquiring, stocking, moving and controlling materials to optimise the usage of facilities and capital funds in order to provide customer/patient service.

Materials include equipment, apparatus, and other supplies used for patient care. 'Material' refers to commodities purchased and stocked by an institution for the purpose of consumption and rendering service (Bharucha, 1989).

1.2 DEFINITION

In the health service organizations material management includes the complete supply process from purchase distribution.

According to Housely, "Management of goods services and equipment from acquisition to disposition"
According to Khare and Monga, "Material management is the integrated function of an organization dealing with supply of materials and allied activities in order to achieve the maximum co-ordination and optimum expenditure on materials."

According to Judith and Maradole, as applied to nursing services, "the management and control of medical, surgical and clerical, inter-department services and equipment from acquisition on floor to disposition of patient care.

1.3 IMPORTANCE OF MATERIAL MANAGEMENT

The fast developing Indian economy has placed a tremendous challenge and responsibility before the material manpower. It is generally found that materials represent the most expensive asset of any organization. Mismanagement of this asset leads to serious losses. On the other hand it's judicious management will minimize losses and achieve maximum service for which they are meant. As stated by Gopal Krishnan, "The importance of material management lies in the fact that any significant contribution made by the material manager in reducing materials cost will go a long way in improving the profitability and rate of return on investment."

1.4 AIMS AND OBJECTIVES OF MATERIAL MANAGEMENT

The aim of material management is to bring about control over acquisition, storage, retrievability, distribution, use and disposal of supplies and equipment in order to carry the primary responsibilities of an organization in an efficient, effective and economical manner. Material management seems to ensure availability of right material, at right time, to right place at the least cost.

Fig. 1.1: Showing the objectives of material management

Check Your Progress 1

1) Define the term 'material management' as applied to nursing services.

[Blank space for answer]
1.5 PROCESS OF MATERIAL MANAGEMENT

Now let us see the process of material management after knowing the definition and importance of it.

1.5.1 Budgeting and Materials Planning

The listing of materials in terms of units required and their cost estimates would constitute the materials budget, which should be prepared annually. This preparation of budget would be based on past levels of performance and on anticipated activity, capital equipment, consumables and supplies to be procured.

Important budgetary control and reduction of material costs is the concept of standardization. This involves grouping together similar items depending on their specifications or use so as to choose one of those more universally acceptable for the purpose. It does not imply just cutting down on the number of sizes which is generally termed as simplification but adoption of standards leading to specification of quality, reduction in sizes and varieties, facilitating interchangeability of components etc.

Concept of value analysis is also related to standardization. This attempt to examine all facts of the function and cost of product/item used in order to determine whether the cost can be reduced without compromising on quality.

Value analysis attempts at addressing the following issues:

- What is the Item?
- What is it intended to do?
- How much does it cost?
- How can an item do the same job?
- What are the suggested alternative cost?

1.5.2 Demand Forecast

After finding out what is required and how much money do you have in hand, you have to find out how much is required, anticipation of future need is done through demand forecasting, which involves application of statistical techniques to predict future requirements based on past consumption patterns.

Several techniques of forecasting exist. Trend line, semi-average method, moving average method, least square method weighing through exponential smoothing, application of trend and seasonability indices etc. are a few to mention.
These methods of demand forecast can be summarized as:

1) Last period demand forecast for the next period is done on the basis of the level of demand that occurred in the previous period.

2) Arithmetic average: Average of all past demands is taken for forecasting demand.

3) Moving average: Forecast for the next period is generated by averaging the actual demand for last ‘n’ time periods where ‘n’ can be about (2-3 years).

1.5.3 Procurement

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

The hospital can have centralised purchasing or decentralized purchase system. Even some hospitals in the same region can have combine purchasing system which is known as group purchasing.

The purchase parameters can be shown by the following exhibit.

<table>
<thead>
<tr>
<th>Selection of Items</th>
<th>Placing of Order</th>
<th>Receipt of Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>&amp; Demand Estimation</td>
<td></td>
<td>Storage</td>
</tr>
<tr>
<td>Disposal or</td>
<td>Maintenance</td>
<td>Issue for Consumption</td>
</tr>
<tr>
<td>Condemnation</td>
<td>and Repair</td>
<td></td>
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</tbody>
</table>

Fig. 1.2: Material management an integrated approach

1.5.4 Receipt, Inspection, Acceptance and Payment (Inspection and Quality Control)

The materials ordered are received in the stores. There is a reasonable policy and methodology of inspection of incoming materials, which is an essential element.

Receiving, quality inspection and acceptance are important points in material management. On accepting the goods and certifying correctness, the bills should be forwarded for payment.

1.5.5 Storage

The objective of storage is to ensure that the issue of material for usage of the supplies are adequately preserved to prevent loss or damage. The details of storage and issue will be dealt in Unit 2 of this block.

1.5.6 Inventory Control

Principles of inventory control seek to minimize investment on materials so that sufficient working capital is available for other important activities of the organization.

The primary aim of inventory control is to decrease material cost by preventing overstocking the material which result in locking up capital, possible pilferage and obsolescence. The details on inventory control will be discussed in Unit 2 of this block.

1.5.7 Issue and Distribution

Items held in inventory by the stores may be issued through indents to the user department on periodical basis. The further details of issue and distribution is dealt in Unit 2 of this block.

1.5.8 Maintenance

Proper maintenance of equipment, furniture and fixtures not only ensures their continuous availability but also their extended life, hence lowering the cost.
The nurse in her unit is the user of various equipments, therefore she needs to maintain the equipment for their longevity.

1.5.9 Disposal and Condemnation

Indents are often arbitrarily made with improper scrutiny. This leads to an unofficial inventory in the nursing units. It is therefore necessary for a nurse administrator to inspect the stores periodically and return the excess stock to the main store, or condemn articles on the spot to prevent the store in becoming a dumping place.

Usually, all hospitals have a condemnation committee, whose duty is to review the stock from time to time and assess the materials that are to be disposed or condemned.

1.6 ROLE OF A NURSE IN MATERIAL MANAGEMENT

The nurse as the user of the material is in the best position to cut the cost of materials in her unit, or to utilize it at its best. Her role as a middle manager is very important in the smooth functioning of the unit. Hence, her role in material management can be summarized as:

- She should have sound knowledge of the requirements and functioning of her unit.
- Must prepare budget for materials required.
- Forecast the demands for smooth running of the unit (less or more supplies will cause mis-management and poor quality of patient care).
- Prepares, assists and maintains the policy about purchasing, inventory, maintenance, prevention of pilferage and condemnation of the unservicable items.
- Exercise her powers to control the inventory in her unit.
- Ensures perfect functioning of the equipment in the unit under her control.
- Should be able to provide feedback about the materials regarding their quality to the purchase department.
- Accurate recording and reporting of the materials required regarding their maintenance and quality.
- Prepares guidelines and ensures that they are followed properly regarding the breakdown of equipment, loss of equipment and avoid mishandling of them.
- Research activities to assess the impact of material management on patient care.
- Evaluation of the procedures, policy and performance of equipment and feasibility of the policies should be documented.
- Should be able to prevent pilferage and fraud, hence be alarmed at the night time.

Check Your Progress 2

1) Enumerate the various steps of process of material management.

2) Define the following:
   i) Lead time
In this unit we have studied about the importance, objectives and the process of material management. It is estimated that 10 per cent of cost can be reduced by efficient material management process. Scope of the process is broad and are very vital in the successful operation of community health programmes like immunization and family welfare programme.

- The required material should be estimated by forecasting. It is needed to prevent both the shortage and unofficial storage.

The nurse is always asked upon to make forecast of the requirement at her nursing unit. She maintains the equipment and supplies, and keeps a proper inventory. She is also in a position to prevent the pilferage in the given nursing unit. She needs to assure the quality of items received by her and the need to store all the materials properly. The nurse is the only person to give feedback about of the materials which are consumed in her unit.

Thus for understanding the right process of material management, she can streamline the supply/maintenance and condemnation system in her nursing unit and hence provide efficient client care.

### 1.8 KEY WORDS

<table>
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<th>Term</th>
<th>Definition</th>
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<tr>
<td>Buffer Stock</td>
<td>Buffer stock or safety stock or additional inventory required to cover the unusual demand (which exceeds the forecast of demand)</td>
</tr>
<tr>
<td>Forecasting</td>
<td>Estimation of the future demand on the basis of the past.</td>
</tr>
<tr>
<td>Inventory</td>
<td>Relates to total quantity of material available in the store.</td>
</tr>
<tr>
<td>Lead Time</td>
<td>The time required after being aware of the need of the stock to its actual replenishment.</td>
</tr>
<tr>
<td>Pilferage</td>
<td>Frauds involving buyer-vendor collusion, the theft in the hospital and unofficial inventory.</td>
</tr>
<tr>
<td>Value Analysis</td>
<td>Based on the elementary principle of right quality of material to be supplied. This includes questioning and analysis of each specification to ensure if it could be amended or substituted to maximize the end use of material.</td>
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</table>
1.9 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) According to Judith and Maradole, "The management and control medical, surgical, clerical, inter departmental services and equipment from acquisition on floor to disposition of patient care."

2) Any significant contribution made by materials manager is reducing the cost which in turn can be utilized for other functions of the organization.

3) i) Standardization
   ii) Product improvement
   iii) Inter departmental harmony
   iv) Economic forecast
   v) Economic buy
   vi) New material and products
   vii) Favourable reciprocal relations.

Check Your Progress 2

1) i) Budgeting and material planning
   ii) Demand forecast
   iii) Procurement
   iv) Receipt, inspection, acceptance and payment (inspection and quality control)
   v) Storage
   vi) Inventory control
   vii) Issue and distribution
   viii) Maintenance
   ix) Disposal and condemnation

2) i) Lead time: The time required after and is aware of the need of the stock to its actual replenishment.
   ii) Buffer stock is an additional inventory required to cover the unusual demand.
   iii) Inventory: Related to the total quantity of materials available in the store.

3) • Check the equipments periodically
   • Assign special duty to the nurses and get a feedback.
   • In case of breakdown inform the maintenance department/agency urgently.
   • Keep a record of the maintenance expenditure and duration of breakdown.
   • Have a separate storage for the equipments which are out of order.
   • Receive equipments after proper inspection.

1.10 FURTHER READINGS


Francis, C.M., Desouza, Mario, C., (2000), Hospital Administration, 3rd edn., New Delhi, Jaypee Brothers Medical Publisher, 247-270.


TNAI (2000). Nursing Administration and Management, 1st edn., New Delhi, Academy
UNIT 2  STORING AND ISSUING THE EQUIPMENT

Structure

2.0 Objectives

2.1 Introduction

2.2 Storing Management, its Type and Function
   2.2.1 Stores System and Procedures
   2.2.2 Incoming Material Management
   2.2.3 Store Accounting and Stock Verification
   2.2.4 Obsolete, Surplus and Scrap Management
   2.2.5 Value Analysis
   2.2.6 Automation Storage/Retrieval

2.3 Inventory Control
   2.3.1 Objectives of the Inventory Control
   2.3.2 Methods of Inventory Control

2.4 Issue/Supply of Equipment
   2.4.1 Arrangement of Store
   2.4.2 Ward/Departmental Replenishment System

2.5 Use of Computers in Stores

2.6 Disposal and Condemnation

2.7 Let Us Sum Up

2.8 Key Words

2.9 Answers to Check Your Progress

2.10 Further Readings

2.0 OBJECTIVES

After going through this unit, you will be able to:

- describe the process of storing;
- discuss the methods of inventory control; and
- explain the procedure of issuing the equipment/supply.

2.1 INTRODUCTION

You have studied in the previous unit about the process of material management. Storage was one of the processes which is being dealt in this unit in detail.

The store management is very important in a hospital. There is hardly anything, which will not be required in a hospital sometimes or other. So it becomes obligatory on the part of hospital stores officer that all these materials are procured properly, adequate quantities but not too much to lock up the capital. The materials need to be stored properly to avoid damage and obsolescence. The cost of capital block in store is substantial.

The material pilferage, deterioration and careless handling may lead to wastage of money.

The functioning of hospital stores include receiving the material ordered by the purchase department, inspection of material, storage and preservation. The hospital store also has a function to issue the materials to the user department.

In this unit you will be studying about storage and issuing of the materials.
2.2 STORING MANAGEMENT, ITS TYPE AND FUNCTION

The objectives of store management is to ensure that, till the time of the issue for usage, the supplies are adequately preserved to prevent loss or damage.

The store department should be conveniently located to facilitate easy receipt of materials from suppliers and easy dispatch of supplies to the wards and departments. It should be of sufficient size to accommodate all the supplies, should be fire proof and have refrigerator for materials to store at lower prescribed temperature and adequate space to store substances. The material should adequately be protected from fire, pest, water and seepage etc.

Functioning of stores as defined by Verma (1982) are as follows:

- To receive material ordered by the purchase department.
- To inform indenting department for the arrival of the material.
- Inspection of received materials.
- Entry of material into store ledger.
- Storage and preservation of materials.
- Issue of materials against authorized indents.
- Bill passing of materials received.
- Entry of issued materials into ledger.
- Physical safe custody of material.
- Raise purchase requisition for inventory items.

The hospital stores can be divided into two broad categories – consumable and non-consumable stores.

According to Professor Sinha (1979), Hospital stores can be planned according to the nature of store, e.g.

a) Drug store consist of emergency drugs, general drugs, special drugs, gases and chemical etc.

b) Surgical store consists of the items like bandages, gauze, sutures, instruments, equipments, rubber goods, glass items, cotton and general surgical items.

c) General store includes items of general cleaning, general furniture and electric goods and other items of plumbing etc.

d) Linen store includes textile, synthetic fabrics and woollen articles and furnishing.

e) Stationery store consists of all the stationery items such as medical forms, papers, and medical and nursing documentation format.

2.2.1 Stores System and Procedures

In this sub-section, we will study the system of store. The systems in store can be studied under three areas namely, receipt, stocking and issue. Well-designed store systems and procedures ensure timely information for decision-making, particularly because stores are the starting point of all activities for control.

- Receipt System: The store department receives the items from the suppliers. This system starts with the placement of purchase order by the purchasing department, a copy which is sent to the stores. This is maintained in chronological order.

- Physical System: When the supplies actually reach the store it is physically verified with all the documents. The inspection of the goods is either done by the purchase manager or by the user department.
Storage System: The receipt and inspection stage, is followed by stocking. Stocking involves routine activities like storing out materials coming at the end of the inspection process and storing them in proper place. The storing system can be open or close.

Random Access Stores System: There should be proper stores record system and proper ledger should be maintained.

Issue System: This is the last stage in store system, which you will be studying in detail in the next section of this unit.

2.2.2 Incoming Material Management

The material manager is concerned about the quality of incoming materials, as s/he is responsible for the supply of right quality materials to the user departments, so that the quality of end products is ensured. Inspection is the method by which quality can be assured. Before the final acceptance of the material is to be assured that the material is standard and are in working condition. This can be done by checking the materials randomly.

2.2.3 Store Accounting and Stock Verification

Store Accounting

Store accounting is important from the point of view of estimating the cost of the material for pricing decisions. The costing of materials should be done both for the materials consumed and estimating the value of materials held in stock. Some of important and frequently used systems are as follows:

a) First in First Out (FIFO) Method: This system is based on the assumption that the oldest stock is depleted first. The advantage of this system is that materials are priced exactly at original cost. Since actual prices are used, there cannot be any profit or loss in the pricing arrangements. In FIFO process, the value of the stocks held at hand is the money that has been paid for that amount of stock at latest price levels and hence can straight away be used in balance sheet, truly effecting the value. The limitation of this system is when too many changes in price level are encountered. FIFO is unsuitable when inflationary conditions are not stable.

b) Last in First Out (LIFO) System: This system is based on the assumption that most recent receipts are issued first. As the latest prices are charged in this system. Advantage of this system is that it reflects the current price. In the inflationary condition this method is not suitable since it will show high profit.

c) Averaging Unit Price Method: In this method the issue price (and the price of the inventory) is set by averaging the quantities and price of each new purchase of the item. This is suitable for both inflationary and deflationary conditions since it reflects lessor gain or loss than the previous methods.

In this method no cumbersome calculations are involved.

Stock Verification

Some discrepancies between the actual and the book balances of inventories are bound to occur despite of diligent store keeping. The purpose of stock verification include:

- Areas to be identified deserving first control.
- To backup the balance sheet stock figures.
- To compare the store records and documents for their accuracy and usefulness.
- To minimize the pilferage and fraudulent exercise.

The verification of the stock can be done in following manners:

a) Physical Verification (Annual or Periodical): In this system the entire inventory is physically verified at the end of a period. As all the items are checked at one time there can be no confusion about any item being left unchecked.

b) Perpetual Inventory and Continuous Stock Taking System: The perpetual method is
more applicable for big hospitals where complete closing down of the hospital is not possible. In this method stock verification is done continuously throughout the year.

The advantages of this system are:

i) The closing stock verification is not required.

ii) Method is less costly, less tiring, less cumbersome and more accurate.

iii) Discrepancy and defects are readily rectified after they are detected.

iv) Slow moving stocks can be noted and proper action can be initiated in time.

v) The stocks are kept in limit.

2.2.4 Obsolete, Surplus and Scrap Management

Obsolete items are those material and equipment, which are not damaged and have economic worth but are no longer useful.

Surplus items are those materials and equipment which have no immediate use but have been accumulated due to faulty planning, forecasting, and purchasing scrap is process wastage, such as waste food in the kitchen.

The obsolete and surplus items increase the inventory carrying cost and waste the resources. Therefore while doing the stock verification of these items should be identified and taken care of.

2.2.5 Value Analysis

Value is the broad term often used to denote cost and price. Value can be divided into following classification:

1) User and Functional Value: The properties or qualities which accomplish a use, work or service.

2) Esteem Value: The properties, features or attractiveness which causes to own it.

3) Cost Value: The sum of labour, material and various other costs.

4) Exchange Value: Its properties or qualities which enable us to exchange it for something else we want.

We can now define the value analysis as:

"An organized creative approach which has its objective—the achievement of the value of the material". Value analysis aims at reducing cost value to the value of the product.

Therefore, Value = Function/Cost

The basic framework for value analysis is approached by the following questions as given by Lawrence D. Miles:

1) What is the item?

2) What does it do?

3) What does it cost?

4) What else job it will do?

5) What would be the alternative cost?

You need to answer above questions to do value analysis.

2.2.6 Automation Storage/Retrieval

Automated material handling system are used for the unit load type storage retrieval system. By making use of pre-defined system the operator goes through storeroom, stops the handling of equipment/supply at respective bins and completes the list in a picking tour.

The retrieval is as important as the storage itself. If one cannot get the items from the
store immediately without wasting time, it is a wastage of resource. We will be discussing more about retrieval in the issuing system from the store, later.

Check Your Progress 1

1) Enumerate the types of stores in the hospital.

2) What do you understand by:
   a) FIFO
   b) LIFO

3) Enumerate the methods of stock verification.

4) What is the basic framework for value analysis?

2.3 INVENTORY CONTROL

Now you may be interested to know what is inventory so it is defined as, “Inventory is the sum total of costs of all supplies official and non-official, wherever they may be stored have not yet been used.” (Housely).

Webster Dictionary defines it as, “The quantity of goods of materials in hand”.

It is also said the inventories are a liability not an asset.

Inventory control is a tool of management, which is used to maintain an economic minimum investment in materials and products for the purpose of obtaining a maximum financial return.

In the inventory control system control is exercised by fixing a minimum and maximum level for each item. An item is ordered in such a way that the stock level, at any time, never goes beyond the minimum level fixed for it. Similarly, the quantity to be re-ordered is so adjusted that the stock does not exceed its maximum level. Thus the system answers the two fundamental questions—when to reorder and how much to order?

Both quantity and cost of service together contribute significantly to determine the level of patient care in a hospital since efficient care at minimum cost is the primary obligation of the hospital and the entire concept of inventory control system stems out of this basic economic principle i.e. “Stretching the limits means to meet the unlimited ends”.
2.3.1 Objectives of the Inventory Control System

As defined by Monga and Khan, "The main objective of inventory control is to reduce the financial investment in inventories, to minimize idle time by avoiding stocks out and storage of essential medical and surgical items in order to avoid issues due to obsolescence and hence improve the quality care in hospitals.”

The main principle of inventory control is that items for which annual consumption is high, orders are placed frequently so that the inventory level is as low as possible. Items where annual consumption is not high, sufficient stocks are maintained and order placed less frequently.

2.3.2 Methods of Inventory Control

Various methods are used in inventory control, which will be dealt now one by one:

1) Periodic/Cyclic Method

This method involves review of stock status at periodic/fixed intervals and placement of orders depending upon the stock on hand and rate of consumption. The ordering interval is thus fixed but the quantity to be ordered varies each time. The time interval depends on the lead time for procurement, stock out cost, degree of control required.

2) Two Bin Method

This is a perpetual inventory method where conceptually the stock of each item is held in two bins, one larger bin containing sufficient stock to meet the demand during the interval between the 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 second bin is utilized until the ordered material is received.

3) Lead Time

You have learnt about the lead-time in the previous chapter. Let us revise it.

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.

4) Minimum/Safety/Buffer Stock

This is the amount of stock that should be kept in reserve to avoid a stock exhaustion in case consumption increases unexpectedly.

Stocks out may affect the hospital functioning in the following ways:

a) Quality of patient care is affected adversely.

b) Patient dissatisfaction.

c) Emergency purchase of stores at high cost.

d) Extra transportation charges.

e) Over loading of machine and men.

5) ABC Analysis

The word ABC stands for “Always Better Control”. The intention is to control the best, then better and lastly the good. ABC analysis is the analysis of stores on cost criteria. By analysis of total cost of various inventories it has been found out that inventories can be divided into three groups known as A, B and C. The analysis has revealed that 10% of the items of inventory are attributed to nearly 70% of the value of inventory, 20% of items attribute 20% of the value of inventory and 70% of items of inventory will be of low value attribute only 10% of the value of the inventory.

Based on ABC analysis an average pattern of percentage of items and percentage of their respective rupees value can be worked out as follows:
It has been seen that a large number of items consume only a small percentage of resources and vice versa. Item A represents high cost centre, item B intermediate cost and item C are low cost centres. So far as inventory control is concerned the following guidelines help in keeping the system optimum:

**Items A**
- Tight Control should be exercised.
- Rigid estimates of requirements.
- Strict and close watch.
- Safety stock should be low.
- Management of items should be done at top management.
- Exact cost of individual items be counted.

**Items B**
- Moderate control.
- Purchase based on exact requirements.
- Reasonably strict watch and control.
- Safety stocks moderate.
- Management done at middle level.

**Items C**
Item C is not subjected to much control or attention.

### 2.4 ISSUE/SUPPLY OF EQUIPMENT

Issue should be made after receiving the written indents. The indents could be annual, supplementary and emergent indents.

Annual indent is the forecast of requirements for the coming financial year. It should be prepared carefully every year after taking into account the existing stock position of the last one year's average consumption (mean of last three years) and quantities required for the next year.

Normally, there should not be supplementary indents. However, if needed, it should be submitted separately, provided it is certified that items included therein could not be foreseen at the time of submission of annual indents and are urgently required during the year.

The emergent indents must be avoided and should only be restored when the demand is of immediate and inescapable nature and funds out of the departmental allocation are available.

#### 2.4.1 Arrangement of Store

Arrangement of the store should be based on FIFO principle i.e. first in first out method. This method is essential to prevent the non-issue of earlier stock which may get time barred and have to be condemned without use. The older stock is the first one to be issued and should be kept in front line.

The other method of issue are push and pull methods. In the push or pull allocation system, supplies are allocated down the distribution network from supply depots to intermediate store and then the final outlets. Thus the stock is pushed out.

#### 2.4.2 Ward/Departmental Replenishment System

Finally the items has to reach to the wards/departments at the user side, which are as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>A X 100</th>
<th>% of Items Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10</td>
<td>70</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>70</td>
<td>10</td>
</tr>
</tbody>
</table>
1) **Requisition or Drug Basket System**

At defined intervals or as and when the department stock level gets low, a requisition, perhaps counter signed by a higher official is submitted for replenishment to the store. The drug basket involves sending an empty container/trolley with requisition.

2) **Par Level or Top Up System (Toppling System)**

The maximum stock level for each ward/department is predetermined on the basis of the usage rate and frequency of replenishment. This departmental stock is stored in an assigned location. At periodic intervals, stores personnel visit the ward/department carry out a physical inventory of which is available and arrange to replenish the stock to the predetermined maximum level.

3) **Exchange Cart System**

This is similar to the par level system in that there are predetermined maximum stock levels and defined intervals for stock replenishment. The departmental stock is stored in the department and similar/duplicate cart is kept in the store. At regular intervals, the full cart from the stores is taken to the user department and replaced with departmental cart.

### 2.5 USE OF COMPUTERS IN STORES

Computers are used in the stores for easy and quick functioning. It helps in:

- Reducing clerical work.
- Prevention of stock out situation.
- Better control and supervision of inventory and continuous assessment of performance.
- Trend analysis and planning for hospital stores.
- Quick and accurate account keeping.
- Quality control.
- Prevention of pilferage, bureaucracy and corruption.
- Reduction of cost on stores management.
- Reduce the space and other wastage on storage of records.
- Easy retrieval.

### 2.6 DISPOSAL AND CONDEMNATION

Indents are often improperly scrutinized and unofficial inventory kept at the user area. Further capital, equipments, instruments and furniture are occasionally issued to departments in excess of their requirements. It is therefore necessary for nursing supervisors to periodically inspect the sub-stores in the wards.

The hospitals should also have a condemnation committee to review used materials that are to be disposed off. There should also be a procedure laid out for condemnation/disposal by incineration or sale as scrap.

**Check Your Progress 2**

1) Enlist the guidelines for storing ‘A’ items.
2.7 LET US SUM UP

In this unit we have discussed about the functions of stores, management of stores, methods of inventory control and how to issue the equipments to the user departments.

The store management is very important for controlling the cost in the hospital. Proper inventory control, accounting and scrap management is necessary. The issuing of materials should be done in a way that it can be utilized for effective patient care.

It is also very important that the items are issued efficiently to each user area, so that there is no shortage of items at the user end.

At last the computers are becoming an essential part for efficient store management.

2.8 KEY WORDS

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Disposal</td>
<td>The waste material/scrap or the materials which cannot be used need to be removed from the hospital.</td>
</tr>
<tr>
<td>Indent</td>
<td>A written request asking for the items with detail units required.</td>
</tr>
<tr>
<td>Obsolete</td>
<td>The items which is no more in use but are not damaged and has economic worth.</td>
</tr>
<tr>
<td>Surplus</td>
<td>Materials and items, which have no immediate worth but have been accumulated due to faulty planning.</td>
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<tr>
<td>Unofficial Inventory</td>
<td>Collection of the items/equipments which are not in use and not required to be in the department.</td>
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</table>

2.9 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

1) a) Medical and Drug Store
   b) Surgical Store
   c) General Store
   d) Linen Store

2) a) First in first out method of store accounting.
   b) Last in first out method of store accounting.

3) a) Physical verification
   b) Perpetual Inventory Method

4) a) What is the item?
   b) What does it do?
   c) What does it cost?
   d) What else can be done?
   e) What would be the alternative cost?
Check Your Progress 2

1) • Tight Control
   • Rigid estimates
   • Strict and close watch
   • Safety stock should be low
   • Management by the top level management
   • Exact cost of individual items be maintained

2) a) Annual indent
    b) Supplementary indent
    c) Emergent indent

3) a) Requisition or Drug Basket System
    b) Toppling System
    c) Exchange Cart System

2.10 FURTHER READINGS


Francis, C.M., Desouza, Mario, C. (2000), *Hospital Administration, 3rd edn.*, New Delhi, Jaypee Brothers Medical Publisher, 247-270.


UNIT 3  CONTROL AND MAINTENANCE OF EQUIPMENT

Structure
3.0  Objectives
3.1  Introduction
3.2  Control and Maintenance of Equipment
   3.2.1  Meaning
   3.2.2  Definition
   3.2.3  Purposes of Controlling and Maintaining Equipment
3.3  Elements of Material Management System
   3.3.1  Demand Estimation
   3.3.2  Procurement
   3.3.3  Receipt and Inspection
   3.3.4  Storage
   3.3.5  Issue and Use
3.4  Inventory Definition
   3.4.1  Purposes of Inventory Taking of the Ward/Unit
   3.4.2  Inventory Control
3.5  Role of Nurses in Material Management
3.6  Let Us Sum Up
3.7  Key Words
3.8  Answers to Check Your Progress
3.9  Further Readings

3.0 OBJECTIVES

After going through this unit, you will be able to:
- explain the meaning, importance and principles of controlling, maintaining equipment and inspection;
- define material management;
- list the purposes of material management;
- discuss the elements of material management system;
- define logistics and its steps;
- discuss Receipt and Inspection of equipment;
- describe method of inventory control;
- define ABC analysis and VED analysis; and
- explain nurses role in material management.

3.1 INTRODUCTION

You may recall that in your work place you had an opportunity to have an exposure towards management of materials that are used for patient care. This management includes procuring, controlling, maintaining, together will inspection of articles and materials.

In this unit we will be frequently referring to controlling, maintaining and inspection of equipment and materials.
Equipments or materials are very important resources to achieve the objectives of health care organization. More than 50% of budget of an organization is spent on human resources or staff and less than 50% of the funds are used for providing equipment and supplies or materials. Staff or human resources i.e. right people, at the right place, in right numbers, at the right time are very important to provide best care. However if the equipment and supplies are not available efficient staffs also will not able to provide care to the patients. Therefore, it is more vital that materials of right quality and quantity are supplied to the staff in right quality, right time and at the right place for use.

To protect the patients and employees from injury, you must ensure that all patient care equipment are fully functional and serviceable at all times so that in emergency you are not let down and patient care is affected or precious life is lost. All defective equipment are promptly repaired or replaced. You should know how to operate sophisticated equipment, so that you can ensure proper care and storage of equipments when needed. You are also responsible for the continuous vigilance of care of equipment. This is inspection.

You should refuse to use faulty equipment or that which was not designed for use in the situation where it is ordered. Therefore, let us see what is controlling, maintaining equipment and inspection. This will be explained to you in this unit. You will also become familiar with the purposes, principles of controlling and inspection of equipment, which can be of great help while working in various clinical areas. This entire unit is presented to you with a view to give you a basic idea of controlling, maintaining equipment and inspection; along with the process of purchase and transactions.

This will enable you to contribute towards cost effectiveness in patient care and make you an efficient and effective nurse in your roles. Though the presentation of this unit is descriptive, yet you will be encouraged and motivated to critically analyse various issues and examples from your working place.

3.2 CONTROL AND MAINTENANCE OF EQUIPMENT

3.2.1 Meaning

A large variety of materials are used in the hospitals. An average hospital needs more than 3000 items of instrument and equipments. This shows the type of stores used for patient care in the hospital and therefore its management and maintenance itself is very important. Material management is an important aspect of resource management. Proper management of materials are very crucial to all the organization and we the nurses play a vital role in controlling, maintaining and inspecting the materials time to time for efficient and effective patient care.

3.2.2 Definition

Material management is defined as a system of planning, organizing, directing and coordinating, controlling and maintaining adequate equipment and supplies where by there will be right quantity of stock of items properly stored, easily retrievable and distributed for the use whenever required.

3.2.3 Purposes of Controlling and Maintaining Equipment

Material or equipment management is very important in nursing. All the nursing procedures starting from simple to complex, non-invasive to invasive techniques require materials. In other words no nursing procedures can be done in a scientific way without adequate and appropriate materials.

- To make materials available in safe and viable condition as necessary for both elective and emergency situation.
- To increase efficiency of the organization.
- To provide material at an optional cost.
- To cut down material cost through standardization.
- To ensure recycling of materials wherever feasible.
To ensure appropriate and safe waste disposal, which arises out of the use of materials and supplies.

Waste management is a specialized branch with a separate entity.

**Check Your Progress 1**

List the purposes of controlling and maintaining equipment.

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<th>Purposes of controlling and maintaining equipment</th>
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### 3.3 ELEMENTS OF MATERIAL MANAGEMENT SYSTEM

In this sub-section you will learn about elements of Material Management System. You will come to know the purchasing of material storing, issuing and the use of material.

Material management consists of the following elements that are in themselves interrelated and independent, it consists of:

i) Demand Estimation  
ii) Procurement  
iii) Receipt and Inspection  
iv) Storage  
v) Issue and Use  
vi) Maintenance and Repair  
vii) Condemnation and Disposal  
viii) Accounting and Information System/Inventory

Let us learn each of these elements in detail.

#### 3.3.1 Demand Estimation

Estimation of right amount of each equipment is the most crucial factor for maximum use and minimum wastage. Reduce number and variety of materials will lead to less problem of management. Demand estimation of category of material should always be done keeping in view the trend in consumption pattern over the last 2-3 years, the objective of the organization, change in the clientele, changing emphasis on various programmes and activities in the health field or organization this is known as casting and forecasting in nursing service administration.

#### 3.3.2 Procurement

When you have listed down the requirements the next process is procurement of those items. Most hospitals have a set of rules and regulations regarding the procedures of ordering materials. A purchase department may be available and financial authority may or may not be vested in this department. In some institutions a purchase committee may be established beyond the purchase department to scrutinize all the indents or demands as per priority for procurement of materials. The basic principle in all these rules and regulations of procedure is to maximize the value of money invested in purchase.

**Process of Purchase**

As we have already discussed generally most of the institutions have a purchase department it may be centralized or decentralized or a combination of both. The policy on purchase may vary according to the size, structure and complexity of the institution. However, this will provide better control over material management, less of over lapping and duplication and ensures high quality and quantity.
Process of purchase is shown in a diagrammatic way as below:

Different systems are available for procuring materials from manufacturing companies. Few of them, which are practiced in our country, are explained here.

1) **Fixed Quantity Contract**: This type of contract is generally extended, where firms are called to offer materials and a definite number are asked to supply.

2) **Running Contract**: These are contracts for the supply of an approximate quantity of materials at a specific price during a certain period of time.

3) **Rate Contract**: These are the most important contracts as far as health institutions are concerned. In this, the firms are asked to supply materials at specific rates during the period covered by the contract and fixed quantities are not mentioned. The list of materials required is given to the contractors and they provide materials to the demanding office. Watch very carefully the progress of rate contract procedures.

A purchase committee or department can provide maximum flexibility in ordering specified quantities of material at regular interval. This helps us to maintain optimum inventories and minimize the chance of deterioration or obsolescence of materials. Here the quality of the material to a large extent is assured because only the needed material is given for contract.

**Value Analysis**

The basic principle of material use is the right quality of material is done by questioning and analyzing each specification whether it could be amended or substituted so that the use of materials will be at the maximum level. The process of analysis of the intrinsic value of the material for achieving the objectives of the organization is termed as “Value Analysis”. This is an important function of a materials manager.

**How is value analysis carried out?** To carry out Value Analysis we need to answer few questions for better understanding such as:

1) Can the material be dispensed with?
2) Can it be simplified?
3) Will a standard material do?
4) Is the value proportional to its cost?
5) Is anything cheaper but equally good available in the market?
6) Would it not be better to manufacture it?

3.3.3 Receipt and Inspection

As soon as the ordered materials are received in the goods receiving store, inspection should be carried out. The material should be picked upon a random sampling method and it should be inspected physically and chemically (where required). The organization should have inspection policy, procedures and the basic facilities for the inspection and examination. Investment should be done on sound sampling policy and procedures. This will assure the right quality of materials supplied to the organization.

<table>
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<tr>
<th>Points to Remember</th>
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<tr>
<td>1) Receive all items.</td>
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<tr>
<td>2) Check the same against specification and arrange for inspection.</td>
</tr>
<tr>
<td>3) Inform the end users regarding the receipt of materials.</td>
</tr>
<tr>
<td>4) Prepare receipt notes and inform excess or shortage of items received.</td>
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</table>

3.3.4 Storage

Materials after being inspected and received are stored in the storeroom till its distribution and consumption. The store should be located near the other stores of the hospital. It should be accessible to the suppliers and indentors. Location should be as per activity of the stores. Size should be adequate to accommodate all materials such as instruments, appliances, steel racks with shelves. Refrigeration should be available for storing thermolabile items. Many stores maintain two bins method or card system. This method separates the entire stock of each item into two bins or boxes. One bin contains main stock and the second bin contains enough stock to satisfy the demand during lead-time. Lead-time is the time between placement of order and receipt of the same order. As soon as the first bin is exhausted, demand for the order is placed and the second bin's item are issued. Part of new stock received is placed in the second bin as reserve.

3.3.5 Issue and Use

Arrangement of materials can be done Alphabetically or Group wise. Both are easy for identification and retrieval. Materials should be stored on both sides of open rack. These racks are always filled from backside and issued from front side. Materials received later from the suppliers should be stored behind. By this you maintain the principle of "FIRST IN FIRST OUT". "FIFO" means issuing items first which are received first.

Check Your Progress 2

1) List the elements of material management.
2) Define value analyses

3.4 INVENTORY DEFINITION

Let us now discuss about inventory or accounting of items and information system. You must be very familiar with word inventory.
Definitions

1) An inventory is a record of all goods or materials procured, received, stored and used for day to day requirement of consumer's for the organization.

2) An inventory is a detailed list of all materials, their specification and standard number or quantity. Specification makes it possible to identify the material by size, number or description. The standard indicates the quantity that is kept on the ward/unit.

Physical Inventory: The actual count of articles that is made on the wards are known as physical inventory.

3.4.1 Purposes of Inventory Taking of the Ward/Unit

Following are the purposes of inventory taking:

1) To make an account of materials on hand and to check against standard. Corrections are made as necessary.

2) To dispose excess and obsolete materials.

3) To recommend changes in standard.

4) To determine the serviceability of all materials/equipments.

5) To request for repair or replacement if necessary.

6) To return equipment to its proper place if borrowed e.g. central supply department, or another ward.

7) To maintain and trace materials.

Check Your Progress 3

1) Define inventory.

2) List the purposes of taking inventory in the ward or unit.

Certain items need a daily count on a small scale e.g. torch, scissors, stethoscope, sphygmomanometers etc. These items disappear or are easily broken and early discovery of loss items will enhance the patient care. Some items are counted weekly or monthly. For others like furniture bimannual or annual are sufficient. However, when annual inventory is taken, every item in the ward should be counted. Inventory of the ward should be done on a selected day/days when patients are less in ward. Time and assignments should be planned and all personnel should assist in the count of materials.

3.4.2 Inventory Control

Meaning

Inventory control means stocking adequate number and kind of material that are available whenever and wherever required. This has to be according to the financial availability of resources. High inventory level leads to high cost of inventories by:

a) Blocking the finance

b) Large storage space

c) Large handling and administrative charges
Material Management

d) Obsolescence
e) Spoilage etc.

On the other hand low inventories may lead to frequent take outs and high storage cost. A scientific inventory control can balance the cost of carrying high inventories and cost of shortages.

Guidelines to Keep Inventory Control in the Optimum level

A Items
1) Tight Control
2) Rigid estimate
3) Strict and close watch
4) Safety stocks should be low
5) Management of items should be done at top management Level.

B Items
1) Moderate controls
2) Purchase based on rigid requirements
3) Reasonably strict watch and control
4) Safety stock moderate
5) Management be done at middle level.

C Items
1) Ordinary control measure
2) Purchase based on usage estimates.
3) Control exercises by storekeeper
4) Safety stocks high
5) Management be done at lower levels.

Rate of Consumption

Close study of each item of the store, its movement or consumption is a strong tool for proper inventory control. The items can be classified into:

1) Fast moving
2) Slow moving
3) Non-moving
4) Obsolete.

An understanding of the movement of items helps to keep proper levels of inventories by deciding a rational policy or re-ordering of items.

VED Analysis

The materials can be analyzed and classified into Vital, Essential and Desirable items.

Maintenance of Buffer Stock

A stock of additional items which is maintained for meeting the emergency demands is termed as Maintenance of Buffer Stock.

Preventive Maintenance means Monitoring, Protecting and Maintaining of all equipments used for patient care services. Various sophisticated biomedical equipments are maintained through service contracts.

3.5 ROLE OF NURSES IN MATERIAL MANAGEMENT

Material management also includes economy of materials, prevention of wastage and recycling or reuse of materials whenever possible. Effective material management is primarily concerned with logistics management.
As you know a lot of finance is involved in procuring the materials for patient care. Therefore, it is extremely important to manage the materials efficiently, effectively and economically while providing nursing care. The ward/unit incharge is the key person who controls and maintains patient care activities daily also. S/he along with her/his team is responsible for material management in ward.

1) Ensure regular and adequate flow of materials.
2) Standard and quality materials should be procured which are durable.
3) Monitor quality and safety of materials.
4) Prevent and control wastage/misuse of materials.
5) Develop policies, procedures and routine for indents.
6) Receive, store and check timely replenish all necessary materials.
7) Maintain emergency and buffer stock.
8) Arrange for preventive maintenance wherever needed.
9) Maintain proper inventory and stock of all materials. Periodic or daily or weekly inventory done.
10) Arrange for condemnation of broken and worn equipment as per the policy and procedure of the organization.
11) Assist in the audit materials as and when required, time to time inform loss, misplacement and shortage.
12) Orient all the nursing personnel regarding the policies of material management.
13) Participate in developing policies for material management.
14) Participate in the purchase of materials and advise to purchase materials as per specifications.
15) Evaluate the system of material management.

Effective and efficient material management is concerned with logistics management. Activities of planning, organizing, directing and controlling material is known as logistics. Logistics include:

1) Procurement
2) Delivery of items including transportation.
3) Regular flow of adequate quantity of materials.
4) Maintenance of materials.
5) Monitoring the quality and viability of materials.
6) Monitoring the quantity of materials.

Check Your Progress 4
1) List the role of nurses in material management.
2) Write six elements of logistics material management.
3.6 LET US SUM UP

In this unit we have discussed how to control and maintain materials and the purposes of maintaining equipment. We concluded the unit with the role of nurses in material management.

We have discussed elements of Material Management System under the following headings:

- Demand Estimation
- Procurement
- Receipt and Inspection
- Storage
- Issue and Use
- Maintenance and Repair
- Condemnation and Disposal
- Accounting and Information System/Inventory.

In discussing procurement, we have explained different systems available in our country.

1) Fixed Quantity Contract
2) Running Contract
3) Rate Contract

Value analysis and how to carry out value analysis.

Important points related to receipt, inspection and storage of materials and inventory control.

ABC Analysis
VED Analysis

We do hope that you have found this unit interesting. We wish you would manage the materials in your area economically and efficiently.

3.7 KEY WORDS

| Buffer stock | An organization's equipment and supplies |
| Consumption | Obtaining |
| Contract | Buying |
| Inventory | An agreement |
| Materials | A detailed list of goods, furniture and equipment |
| Procurement | Additional items are stocked to meet the emergency needs |
| Purchase | Using up of resources |

3.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

i) To made materials available in safe and viable condition as necessary for both elective and emergency situation in required quantity and quality for carrying out health care activities.

ii) To increase efficiency of the organization.

iii) To provide material at an optional cost.

iv) To cut down material cost through standardization.

v) To ensure recycling of materials wherever feasible.
vi) To ensure appropriate and safe waste disposal which arises out of the use of materials and supplies.

Check Your Progress 2

1) i) Demand estimation
   ii) Procurement
   iii) Receipt and inspection
   iv) Storage
   v) Issue and use
   vi) Maintenance and repair
   vii) Condemnation and disposal
   viii) Accounting and information system/inventory

2) The process of analyzing the intrinsic value of the material for achieving the objectives of the institution is formed as value analysis.

Check Your Progress 3

1) Definition of inventory are:
   i) An inventory is a record of all goods or material procured, received, stored and used for day to day requirement for the patients.
   ii) It is a detailed list of all materials, their specification and standard number or quantity, specification makes it possible to identify the material by size, number or description. The standard indicate the quantity that is kept on the ward/unit.
   iii) The actual count of articles which is made on the wards is known as physical inventory.

2) i) To make a count of materials on hand to check against standard and corrections are made as necessary.
   ii) To dispose excess and obsolete materials.
   iii) To recommend changes in standard.
   iv) To determine the condition and loss of all materials/equipments.
   v) To request for repair or replacement if necessary.
   vi) To return equipment to its proper place if borrowed e.g. central supply department or another ward.
   vii) To maintain and trace materials.

Check Your Progress 4

1) Role of nurses are:
   i) Ensure regular and adequate flow of materials.
   ii) Standard and quality materials should be procured which are durable.
   iii) Monitor quality and safety of materials.
   iv) Prevent and control wastage/misuse of materials.
   v) Develop policies, procedures and routine for indents.
   vi) Receive, store and check timely replenish all necessary materials.
   vii) Maintain emergency and buffer stock.
   viii) Arrange for preventive maintenance wherever needed.
   ix) Maintain proper inventory and stock of all materials. Periodic or daily or weekly inventory done.
   x) Arrange for condemnation of broken and worn equipment as per the policy and procedure of the organization.
xi) Assist in the audit of materials as and when required, time to time inform loss, misplacement and shortage.

xii) Orient all the nursing personnel regarding the policies of material management.

xiii) Participate in developing policies for material management.

xiv) Participate in the purchase of materials and advise to purchase materials as per specifications.

xv) Evaluate the system of material management

2) The six steps are:
   i) Procurement
   ii) Delivery of items including transportation
   iii) Regular flow of adequate quantity of materials
   iv) Maintenance of materials
   v) Monitoring the quality and viability of materials
   vi) Monitoring the quantity of materials.

3.9 FURTHER READINGS


Sahni, Ashok, *Hospital and Health Administration*, Indian Society of Health Administrators, Bangalore, 1999.

UNIT 4 MANAGEMENT OF DRUGS

Structure
4.0 Objectives
4.1 Introduction
4.2 Meaning and Definition
   4.2.1 Purposes of Management of Drugs
4.3 Ordering, Stocking and Storing Drugs
4.4 Issue of Drugs and their Controlled Use
4.5 Maintenance of Life Saving Drugs
4.6 Role of Nurses in Drug Management
4.7 Let Us Sum Up
4.8 Key Words
4.9 Answers to Check Your Progress
4.10 Further Readings

4.0 OBJECTIVES

After going through this unit, you should be able to:

- explain the meaning of drugs;
- list the purposes of drug management;
- promote wise usage of drugs;
- prevent drug wastage;
- order, store and stock the drugs properly;
- prepare a list of life saving drugs; and
- identify the role as a nurse in drug management.

4.1 INTRODUCTION

"Management of drugs" in any health institution is an integral part of the overall management of the unit/ward. You know that drugs can be quite helpful but can be harmful too. Therefore you should possess knowledge of drugs and skills of administering the drugs.

Nurses and physicians are held legally responsible for safe and therapeutic of drug administration. Nurses are responsible legally, morally and ethically for every drug we administer or have administered no matter who actually prescribes it. In fact all members of the health team may be held responsible for any problem caused to the client. The increase in litigation against the nurses and physicians indicates that the society is aware of their rights. Clauses have been brought against health professionals for drug errors that caused loss of life and permanent injury through the forum of "Consumer Protection Act" and permits compensation to those harmed or injured. The law is protective force for the knowledgeable, competent and responsible nurses. We can safeguard the patient from the drug induced harm by following these points:

- Use correct technique and precaution.
- Observe and chart drug effects explicitly.
- Keep abreast with latest knowledge.
- Refer professional literature of pharmaceuticals, pharmacists and other colleagues.
Question the drugs order that is not clear or that appears to contain some error.

- Refuse to administer or refuse to allow others to order or administer a drug if there is a reason to believe that it will be harmful.

We are entrusted with the responsibility of hanging potent and habit forming drugs. Therefore, we should not abuse or misuse the responsibility and authority of administration of drugs. Drugs are comforting and life saving. If they are used unwisely or with undue dependence they can lead to tragedy. Close attention to all the details of drugs we administer helps us to learn to identify them, tailor their application and spot errors before they occur.

Drugs are very expensive. So wasting or misusing of the drugs will lead to shortage of supply and patients cannot be treated properly. A competent and diligent nurse will make intelligent observation with moral integrity and factual knowledge of which she can manage the drugs wisely in her unit.

Learning is an active process, therefore we shall learn about the definitions of drug, purposes of drug management, life saving drug list, ordering, storage and usage of drugs in this unit. Let us start with definitions.

### 4.2 MEANING AND DEFINITION

The word “Drug” has originated from a French word “Drogue” meaning a dry herb. It is the single active chemical entity present in medicine that is used for diagnosis, prevention, treatment and cure of disease.

#### Definitions

A drug is any substance used in diagnosis, cure treatment and prevention of a disease. The term medicine is also used interchangeably the ‘drugs’.

WHO (1966) defines “Drug is any substance or product that is used or is intended to be used to modify or explore physiological system or pathological states for the benefit of the recipient. The term “Drug” is being also used to make addictive substance. However, this unit is restricted to only the honoured term.

#### Essential Drugs

WHO has defined essential drugs as “those that satisfy the health care needs of majority of the population, they should therefore be available at all times in adequate, amounts and in appropriate dosage forms”.

#### Orphan Drugs

These are drugs or biological products for diagnosis, treatment or prevention of a rare chronic disease or condition for which there is no reasonable expectation that the cost of developing and marketing it, will be recovered from the sales of that drug e.g. dextran sulfate, acetyl-cysteine, baclofen, dismopressin. These drugs are life saving for some patients; they are not commercially available.

### Check Your Progress 1

1) Define drugs.

2) Define essential drugs.
4.2.1 Purposes of Management of Drugs

The purpose of management of drugs is to use drugs wisely and avoid wastage in order to have enough for patient's use. In doing so, we need to remember the following:

1) To provide specified drugs in required quantity and quality to the users or patients as and when required.
2) To promote wise usage of drugs.
3) To avoid wastage of drugs.
4) To order, stock and store the drugs safely.
5) To issue and control the use of drugs.
6) To cut down cost of drugs through standardization.
7) To increase efficiency of the institution/organization.
8) To increase knowledge and proficiency of health team members.

4.3 ORDERING, STOCKING AND STORING DRUGS

You have learnt the definition and purposes of drugs in the previous sub-section, now you will learn about ordering, stocking and storing of drugs.

In the hospitals the overall responsibility for the order and supply of drugs lies with the pharmacy department and that will be the central place in handling. Nurses responsibilities may fall in the following areas:

i) Make cost estimates.
ii) Write a requisition for drugs of required quantity, dosage, form and strength.
iii) Obtain drugs, store them, prepare and administer them to the patient. Record the administration and observe the effects.

Drugs which are of frequent use in a ward or likely to be required in an emergency are usually supplied as ward stock. Traditionally nurses are responsible for ordering and stock of drugs, either by writing out a list of items required or by using a pre-printed order form. In many hospitals a pharmacist checks and supplies drug to an agreed stock level on a weekly or bi-weekly basis. Whichever system is used the purpose must be to avoid both wasteful overstocking and running out of drugs at times when the pharmacy is closed.

Controlled Drugs

Drugs of addiction is supplied only against the signature of a ward in-charge of the ward. The requisition must have the name, form, strength and quantity of drug required e.g. morphine, pethidine, etc. The nurse in-charge should have control on other drugs such as night sedatives, tranquillizers, antidepressants etc. and should take due precautions while ordering those drugs.

Stocking Drugs

All drugs are potentially dangerous and all must be stored in locked cupboards reserved specifically for drugs. In the pharmacy or medical store they should have a graded temperature zone to store various items separately e.g. injections, tablets, local use agents, poisons from non-poisonous inflammable from non-inflammable. Drugs and medicines are grouped according to the pharmacological actions and according to the classification.

Systematic stocking of drug is an essential part of drug management. Drugs received are recorded in a stock ledger or on stock cards. In stock ledger each item has a separate page
in the book, whereas in the stock card system each item is in a separate loose card. Advantage of having this loose card can be that each particular item can be pinned to the shelf next to the drug stock to which it refers. This is very convenient method for keeping record of all drug issues especially if frequent issues are there.

**Storage of Drugs**

A large variety of drugs needs to be stored at temperature of 15-20° C. Sera, vaccines need to be stored at temperature of 2-10° C. Therefore, cool and cold room conditions should be made available in all pharmacies/medical stores and strict monitoring of temperature done by the store in-charge and the supervisor.

**Storage at Ward/Unit Level**

1) The ward in-charge is legally authorised to possess controlled drugs for use in her ward/unit. All other drugs issued to the ward are in her custody.
2) Keys of the drug cup boards must be held by an in-charge/staff nurse.
3) Drugs in current use may be stored in drug trolley provided and these are locked.
4) Pharmaceutical preparations, such as lotions, disinfectants are also dangerous if misused and must be locked in cup boards.
5) Label each container clearly and properly with adequate instructions of storing.
6) Oil and similar substances should be kept in a cool place.
7) Drugs to be used externally should be in a separate place from those to be taken internally.
8) Narcotic drugs and any drug under legal regulation should be kept in a definite place under lock and key.
9) Poison should be kept entirely away from other drugs and clearly marked "POISON".

If your hospital has a policy to keep each patients medicines separately, with no stock drugs being used it has its own advantage. However, few precautions need to be kept in mind:

- Each patient must have a separate cupboard or shelf area to keep his medicine; so that, when he is discharged, the unused medicines may be returned to the pharmacy promptly to prevent confusion with the next patients drugs.
- Designate the medicines with patients name and not with the bed numbers and room numbers.

**Note:** Provision need to be made in governmental and commercial laboratories for analysing the chemical composition of drugs for quality assurance.

### 4.4 ISSUE OF DRUGS AND THEIR CONTROLLED USE

Drugs are issued from pharmacy/drug store to the ward/unit. They are issued regularly and in required quantities. This enables us to monitor and control drug usage. The frequency of drug issue depends on the circumstances and the type of drugs. Drugs which are in constant use are best issued weekly. Issue the drugs on basis of First In First Out (FIFO) and regular checking of expiry dates on drugs contribute to the safety. The drugs which have an expiry date earlier should be identified with similar mark and should be issued or used first. Keep dangerous drugs in locked cupboard and maintain a register for issues and balances. Drugs on the "dangerous drug list" are controlled by special laws and these are issued only as prescribed by the doctor for the individual patient.

Record each issue on the stock/card ledger, calculate the remaining balance and check against what remains on the shelf or cupboard.

Monitoring and sustenance of the quality and safety of drugs and solutions.

- Check when stocks need to be replenished.
- Monitor drug use against patient treatment.
• Promptly identify discrepancies in drug usage if any.
• Indent, receive, store, check and timely replenish all necessary drugs and solutions.
• Maintain emergency and buffer stock.

Maintenance of an Emergency Trolley in Each Ward/Unit with Life Saving Drugs

It is mandatory that all wards/units maintain an emergency trolley with emergency life saving drugs, solutions, equipment and supplies. The drugs used for the emergencies and the form and route in which they are used depend upon the facilities available and the competence of the nurse who can identify the conditions and administer the drugs safely.

4.5 MAINTENANCE OF LIFE SAVING DRUGS

Certain drugs are used when patients become very ill/sick and immediate use of these drugs can save the life of the patient. It is very important that these vital drugs are always available in the stock to manage the emergencies. Therefore, as an in-charge you need to:

• Make a list of all vital and life saving drugs.
• Keep these together on one shelf of the emergency trolley.
• Check the shelf frequently at least three times a day as the shift duties change and whenever drugs are used.
• Replace the stock by ordering new supplies.
• Check for discrepancy in the use of drugs.

An example of an emergency or life saving drug list for a general ward is:

1) Injection Adrenaline
2) Injection Fortwin
3) Injection Aminophylline
4) Injection Hemacele
5) Injection Atropine
6) Injection Hydrocortisone
7) Injection Avil
8) Injection Preinorm
9) Injection Calcium Gluconate
10) Injection Pottasium Chloride
11) Injection Chlorpromazine
12) Injection Lasix
13) Injection Chloroquin
14) Injection Phenargan
15) Injection Dextrose 50%
16) Injection Diazapam
17) Injection Digoxin
18) Injection Xylocaine 2%
19) Injection Dopamine
20) Injection Xylocaine with Adrenaline

4.6 ROLE OF NURSE IN DRUG MANAGEMENT

You have learnt about drugs in reference to orderings stocking and storage of drugs. Now in this section we will acquaint you about your role is management of drugs.
Drugs are expensive and powerful therefore you should have enough knowledge about them and should develop a positive attitude towards their use.

i) Hold staff meeting to educate them on causes of drug wastage.

Common causes of drug wastage are as follows:
- Ordering more drugs than needed leads to expiry of some drugs.
- Exposing drugs to heat, light and damp environment, contrary to the instruction.
- Issuing too many drugs at the same time, which causes stealing or extravagant use.
- Handing over drugs to the patient who may throw away or forget to take them.
- Using drugs blindly or on trial basis.
- Too many different drugs are used on one patient at one time.
- Using very expensive drugs when cheap and standard drugs are effective and available.

ii) Inform the staff about the cost of various drugs along with their usage.

iii) Make the hospital formulary available to staff which contains common drugs used, their uses and side effects.

iv) Put charts and posters of common drugs and its correct doses in the wards.

v) Discuss one new drug each week in staff meeting.

vi) Educate the patients how to take their drugs, the use of drugs, dosage, regularity and duration etc.

vii) While administering the drugs keep basics of drug administration in mind.

These are few points, which promote wise usage of drugs and prevents and controls wastage of drugs.

Check Your Progress 2

1) Explain common causes of wastage of drugs.

2) Write the role of nurses in drug management.

4.7 LET US SUM UP

In this unit we have discussed about how to manage drugs effectively and efficiently, we have also learnt about the purposes of drug management, importance of maintaining life saving drugs. We have concluded the unit with the role of nurses in drug management including common causes of wastage of drugs. We have discussed how to safeguard the patient from the drug induced harm by keeping the following points in mind:
- Use correct techniques and precautions.
- Observe and chart effects of the drugs clearly.
- Keep current knowledge of effect of drugs.
- Question/clarify if the order is not clear.
Further, on ordering drugs, we have also discussed:

- How to control the drugs?
- How to stock and store the drugs?
- How to issue the drugs and the importance of maintaining life saving drugs in the emergency trolley?

In this unit, we have also familiarised you with the definitions and related terms in drug management.

### 4.8 KEY WORDS

<table>
<thead>
<tr>
<th>Discrepancy in Drug use</th>
<th>The difference between the expected amount of drug to be used is termed as discrepancy.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pharmacist</td>
<td>A person who has been trained to prepare medicines.</td>
</tr>
<tr>
<td>Pharmacology</td>
<td>Scientific study of drugs and their use in medicine.</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>A place where medicines are prepared and given out.</td>
</tr>
<tr>
<td>Side Effect</td>
<td>An additional effect, desirable or undesirable of a drug, which is not the primary purpose of administering the drug.</td>
</tr>
</tbody>
</table>

### 4.9 ANSWERS TO CHECK YOUR PROGRESS

**Check Your Progress 1**

1) A drug is a substance used in diagnosis, cure, treatment or prevention of a disease or condition. The term medication, medicine and medicinal are also used interchangeably with drugs. WHO (1966) defined “Drug is any substance or product that is used or is intended to be used to modify or explore physiological system or pathological states for the benefit of the recipient.

2) WHO has defined essential drugs as “those that satisfy the health care needs of majority of the population, they should therefore, be available at all times in adequate amounts and in appropriate dosage forms”.

3) These are drugs or biological products for diagnosis, treatment or prevention of a rare chronic disease or condition for which there is no reasonable expectation that the cost of developing and marketing it will be recovered from the sales of that drug e.g. dextran sulfate, acetylcysteine, baclofen, dismopressin. These drugs are life saving for some patients; they are not commercially available.

**Check Your Progress 2**

1) i) Ordering more drugs than needed leads to expiry of some drugs.
   ii) Exposing drugs to heat, light and damp environment.
   iii) Issuing too many drugs at same time which causes stealing or extravagant use.
   iv) Handing over drugs to the patients, they may throw away or forget to take them.
   v) Ordering large dose of drugs than necessary.
   vi) Using drugs blindly or on trial basis.
   vii) Too many different drugs are used on one patient at one time.
   viii) Using very expensive drugs when cheap and standard drugs are effective and available.

2) i) Hold staff meeting to educate them on causes of drug wastage.
   ii) Inform them the cost of various drugs.
   iii) Make available hospital formulary to staff which contains common drugs, used, their uses and side effects.
   iv) Put chart and posters of common drugs and its correct doses in the wards.
v) Discuss one new drug each week in staff meeting.
vi) Educate the patients how to take their drugs, the use of drugs, dosage, regularity and duration etc.

4.10 FURTHER READINGS


Trained Nurses Association of India, *Nursing Administration and Management*, New Delhi.


Sahni, Ashok., *Hospital Health and Administration*. 
Block 1: Personnel Management
Unit 1: Introduction to Personnel Management
Unit 2: Personnel Policies
Unit 3: Manpower Development
Unit 4: Interpersonal Relationship

Block 2: Material Management
Unit 1: Introduction to Material Management
Unit 2: Storing and Issuing the Equipment
Unit 3: Control and Maintenance of Equipment
Unit 4: Management of Drugs

Block 3: Hospital Information System
Unit 1: Introduction to Hospital Information System
Unit 2: Financial Management and Budgeting Structure
Unit 3: Cost Benefit Analysis
Unit 4: Auditing of Finance

Block 4: Office Management
Unit 1: Introduction to Office Management
Unit 2: Maintenance of Office Records
Unit 3: Skills Required in Office Management