Chapter 2

Need and scope of Materials Management

Materials Management:-

- is concerned with the planning, organizing and controlling the flow of materials, from their initial purchase to the distribution or to the service points.

  In industry, or service sector, the word 'stock' is replaced by the term "inventory".
- Functional areas typically include purchasing, central service supply and central stores.

- Departments included in day to day managements of hospital inventories are pharmacy, dietary, laundry & linen services, CSSD, house keeping departments etc.

Principles in Materials (Logistics) Management

- These 'righteous' elements can be achieved through various management techniques marked against each principle.

a.	Right quality 	For example, the purchase of branded hospital drugs from renowned pharmaceutical company such as Ranbaxy, Glaxo-Smith, and Reddy's pharmaceutical companies.

b.	Right place of delivery	For example HEPA filters are to be placed in operation theatre, just above main operation table.
c.	Right transport	patients to be shifted from one hospital to another, in a well equipped cardiac ambulance
d.	Right packaging	All medicines purchased for hospital supplies should bear proper batch number, generic name of medicines, date of manufacture and date of expiry.
e.	Right handling methods 	instruction and operating manuals, so that one is aware about how to handle the instruments in the proper manner. For example if a hospital procure new operating microscope in an ophthalmic O.T., then live demos are delivered by company sales and marketing divisions.

f.	Right materials intelligence 	if the particular drug is known to produce side effect to the children, then it should carry the tags dangerous for children. Keep out of the reach of the children.
g.	Right contract or legal procedures	through proper work order contract and their while entering into legal contract with the supplier, for e.g. Indian contract act, sales of goods act, I.S.I. Act , essential commodities act etc.

Need for Materials Management

- To have material on hand when needed at the time of emergency:-
- To have right material on hand when needed:-
- To minimize inventory investment:-
- To operate efficiently:-

- To gain economy in purchasing, particularly where discounts are given for volume or bulk purchases :-
- To satisfy demand of a hospital and health care service during period of replenishment:-
- To carry reserve stocks to avoid stock outs, especially when there may be unexpected surges in demand over short periods of time :-
- To stabilize fluctuations in consumption due to seasonal and other factors:-
- There are costs associated not only with the price of the resource per se, but also with the procurement process

Lead Time

- The period between placing an order and receiving the items.
- It is denoted by letter" L".

Buffer or Safety Stock :

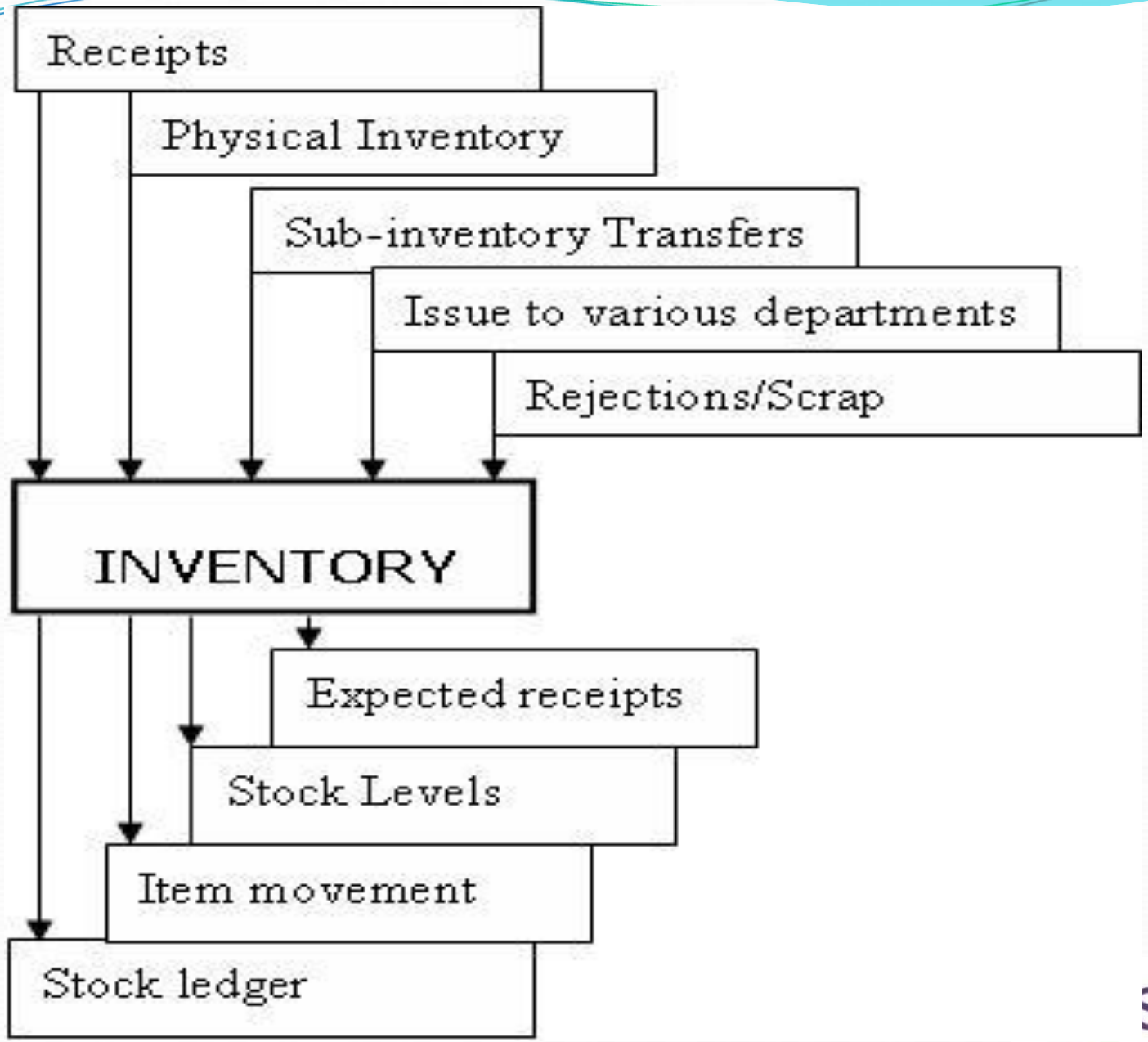
- The quantity of stores set apart as an insurance against the variations in demand and the procurement periods.
- Let us call it '**Qo**'.

Recorder Level :

- It is the stock level at which fresh orders have to be placed.
- Let us call it '**QR**'.
- **Reorder point = safety stock (buffer stock or reserve stock) + usage during in the lead time.**

Safety Stock :

It is also called ***buffer or reserve stock***.



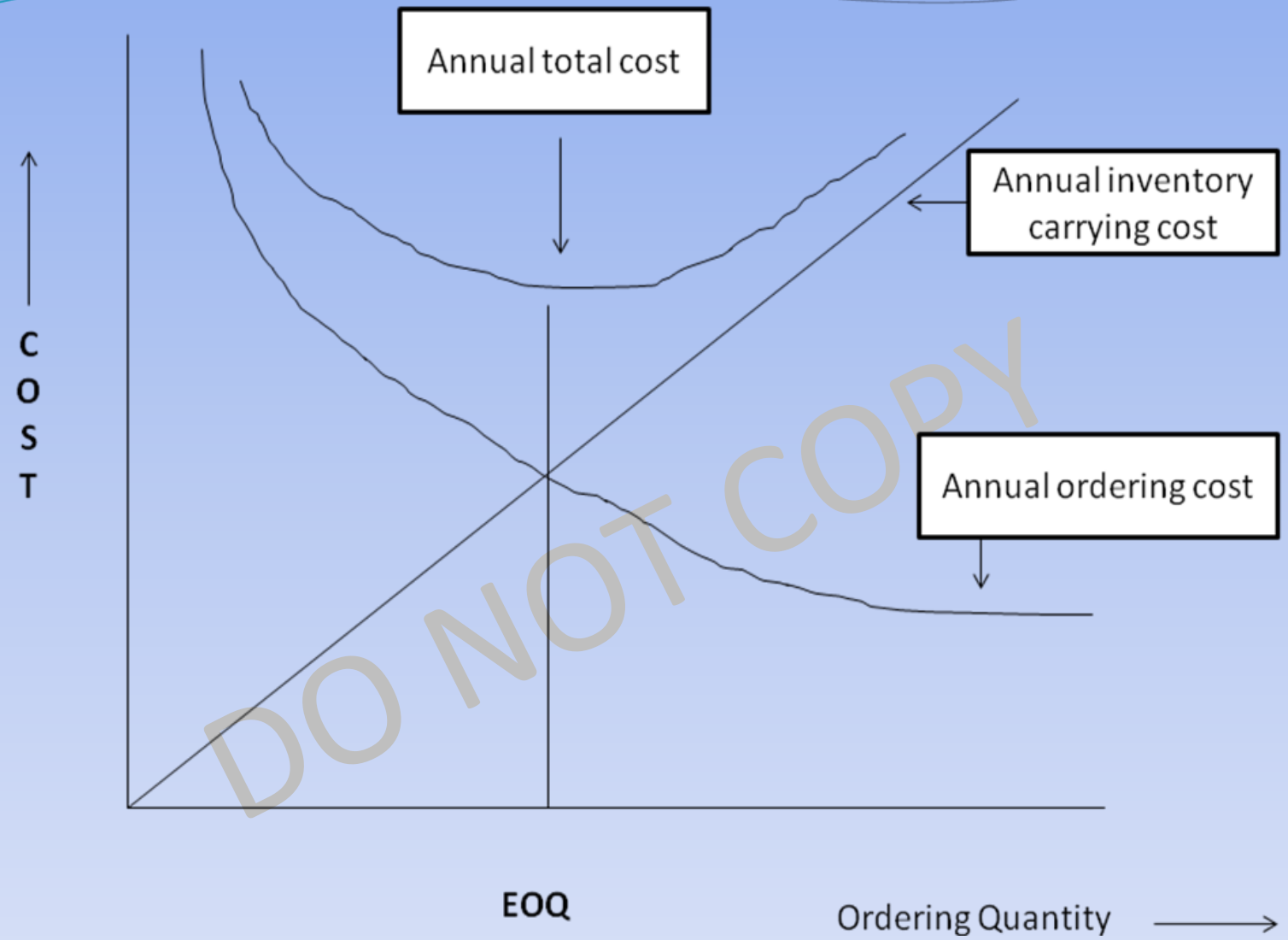
EOQ is calculated based on the following assumptions:

1. Demand for the product is constant and uniform throughout the year.
2. Lead-time is always constant.
3. Price / unit of service are constant.
4. Orderings cost are constant.
5. All demands for the services will be satisfied.

The three costs taken into account are

1. Ordering cost. 2. Inventory carrying cost. 3. Total cost.

The EOQ can also be graphically shown –



- ***EOQ is therefore that quantity of an item to be procured or purchased at which the cost of ordering the annual requirements of an item and the cost of holding that items in stock are nearly equal, i.e., when the total of the two costs is lowest.***

Various inventory control techniques :

1. **A**lways **B**etter **C**ontrol (ABC Classification) classification
2. **V**ital **E**ssential and **D**esirable (VED) Analysis
3. **H**igh **m**edium and **L**ow classification (HML)
4. **F**ast moving, **S**low moving, **N**on moving (FSN)
5. **S**carce, **D**ifficult and **e**asy to obtain (SDE)
6. **M**aterial **R**equirement **P**lanning (MRP) classification
7. **E**conomic **o**rder **Q**uantity (EOQ) Classification
8. **J**ust – **i**n – **t**ime (JIT) Classification
9. **M**inimum, **M**aximum **t**echnique (old methods)
10. **T**wo **b**in **t**echniques (old method)

Objectives of ABC Analysis :

- The main objective of carrying out the ABC analysis is to develop policy guidelines for selective control of items.
- .It is based on the assumption that 10 % of items, which constitutes 70 % of value of inventories, from the most costly items.
- Therefore, the 10 % of items that are most costly constitute 'A' items
- the next 20% constitutes 'B' items
- the balance 70% items which constitute 10% of value of inventory consists of 'C' items.

Advantages of ABC analysis:

1. Preferences for storing inventory and their purchasing can be done appropriately after ABC classification

2. After the process of ABC analysis , the store personnel are in a better position in utilizing and issuing the items

3. The storing, handling and delivery of material to the service department become a systematic process.

- **Example of ABC analysis in day to day hospital practice:**

  ABC analysis : For example anti cancer drug used in oncology department in the hospital, for treatment of cancer patient, such as Ca. Esophagus, Ca. cervix may be required in small quantity, but are usually very costly.

Procedure of ABC analysis

'A' items medicine

'A' items medicine (which account 10% proportion of medicine, but 70% cost), used in hospital pharmacy are

1. Anti cancer dray like
   - Tamoxifen used in Carcinoma Breast
   - Vincristeine used in treatment of leukemia
2. Anti metabolic : methotrexate
   - Methotrexate used in systemic lupus erythromatosis and autoimmune arthritis
3. New generation anti diabetic dry
   - Ex. Gliptins (saxagliptin, vildagliptins)
   - Lantus insulin (injectable)
4. Glucosamine preparations used in the treatment of osteo-arthritis – like freeflex, rejoint etc.
5. Drugs used in patient, post transplant Sx-like kidney transplant, bone marrow transplant
6. Medicines used in treatment of chronic renal failure patient, especially those, who are on haemodialysis – like erythropoietin preparation such as epofit, renal protective drugs such as renalog etc.

'B' items medicines

Which accounts for 20% use in medical field, but accounts for 20-30% cost of medicine, for example?

1. Medicine uses by dermatologist
   - Sun Tan cream or sun protective cream
   - Hair growth stimulant – used in treatment of alopecia.
   - Contractubex ointment, used in treatment of keloid scar
2. Costly medicines used in treatment of arthritis
   - Used of tablet zyloric, used in treatment of gouty arthritis.
   - Collaflex sachets used in treatment of osteo arthritis.
3. Anti TB drugs, used in the treatment of multi drug resistance TB (Ex. MDR T.B.)
4. Veneral disease and HIV treatment such as rotavir,
5. Regular and analogue insulin preparation, for example hum analog insulin preparations.

'C' item drugs

These are most commonly used drugs in medical field and are used throughout the year, in most of diseases.

Ex. 1) Analgesic: Diclofenac, Ibuprofen, Piroxicam.

2) Antipyretic: Crocin

3) Antiseptic: T. Ciplox, oflox, azithromycin

4) Antiseptic creams such as soframycin, nadoxin

5) Injection: Inj. Tetanus toxoid, Inj. Avil, Inj. Crocin.

6) Anti HT drugs: Amlodepine , telmisartan, olmesartan etc.

ABC ANALYSIS WORK SHEET

ITEM %	ITEM	ANNUAL COST [Rs.]	CUMMULATIVE COST [Rs.]	COST %
A 10 %	1	90000	90000	70 %
	2	50000	140000	
B 20 %	3	20000	160000	20 %
	4	7500	167500	
	5	7500	175000	
	6	5000	180000	
C 70 %	7	4500	184500	10 %
	8	4000	188500	
	9	2750	191250	
	10	1750	193000	
	11	1500	194500	
	12	1500	196000	
	13	500	196500	
	14	500	197000	
	15	500	197500	
	16	500	198000	
	17	500	198500	
	18	500	199000	
	19	500	199500	
	20	500	200000	

VED analysis

- Based on critical value (i.e. the drugs used in the treatment of critical or terminal illness, & their usage in that particular disease can prove life saving – for example anti-cancer drugs).

- It is a subjective analysis.

- **Items are classified into:**
  - **V**ital: Shortage cannot be tolerated.
  - **E**ssential: Shortage can be tolerated for a short period.
  - **D**esirable: Shortage will not adversely affect, but may be using more resources.

	V	E	D		ITEM	COST
A	AV	AE	AD	CATEGORY 1	10	70%
B	BV	BE	BD	CATEGORY 2	20	20%
C	CV	CE	CD	CATEGORY 3	70	10%

Category 1 - Needs close monitoring & control

Category 2 - Moderate control.

Category 3 - No need for control

SDE analysis

Based on availability

- **Scarce** (mostly ***imported*** and ***costly medicines***, such as anti-cancer & anti-metabolites)
- Managed by top level management
- Maintain big safety stocks

- **Difficult** (not very costly ***but difficult to procure and place order*** such as indigenous medical and herbal preparations of India, such as ayurvedic and homeopathic preparations)
- Maintain sufficient safety stocks

- **Easily available**
- So maintain the Minimum safety stocks.

FSN analysis :

Based on utilization.

- **F**ast moving.
- **S**low moving.
- **N**on-moving.
- Non-moving items must be periodically reviewed to prevent expiry and drug wastage.

- In a government set-up, it is usual practice to return the medicines to parent company if that particular company medicines are not used & obsolescence .

HML analysis

Based on cost per unit

- **H**ighest
- **M**edium
- **L**ow
- This is used to keep control over consumption

The JIT Concept

- Just in time (JIT), or the Japanese method of integrated philosophy given by Taichi Ohrio, applied this concept at Toyota manufacturing company .

- it is also known as Toyata production system. JIT helps in keeping inventory to minimum in a firm.

- The Just-in-Time inventory system focus is having “the right material, at the right time, at the right place, and in the exact amount”, without the safety net of inventory.

Zero Inventories or ZIN system

Zero inventory is defined as:

- "A system in which a company or health care organization which keeps no or very little inventory in storage, simply ordering exactly what it needs to sell and receiving it in a timely manner.

- Zero inventory is the goal of just-in-time inventory management and the two terms are sometimes used to mean the same thing."

Advantages of JIT

It helps to reduce

a. Waiting time in service process

b. Transportation Bottlenecks

c. Excess inventories

d. Increased process timings

e. Low labour utilization

f. Generation of scrap and rework can be avoided.

Functions of Logistics Management

- Logistics is which primarily concerns with the efficient flow of materials or hospital stocks to the hospital from the retailers or suppliers, flow of hospital stocks through the various departments of a hospital set-up and flow of hospital services i.e. patient care service, out of an organization to the general public for its optimum use.

- deals with several activities which are vital for health care organizations and hospital, and covers maximum utilization, conversation, elimination of wastes, avoidance of unnecessary delays and assurance of right quality and in needed quantity at economic costs.

- Conventionally, logistics costs are buried under overheads as indirect charges under our present cost accounting system.

End of chapter 2