Chapter 3
Materials Planning and Value Analysis

Objective of Materials Planning :

- All hospital spends significant portion of operating budgets on – drugs, suture materials, dressing materials etc .

- In addition , they have to expenses on acquisition of capital equipment
- hospital beds,
- hospital furniture's,
- A.C. conditioning system,
- hospital lifts, ambulances etc
- instruments - operating microscopes, heart lung machines, 3 Telsa MRI SCAN, Sr electrophoresis machines, drilling machines etc.

Objective of Materials Planning……

- Senior managers in the system, are directly involved in the planning, procurement and disbursement of these items.

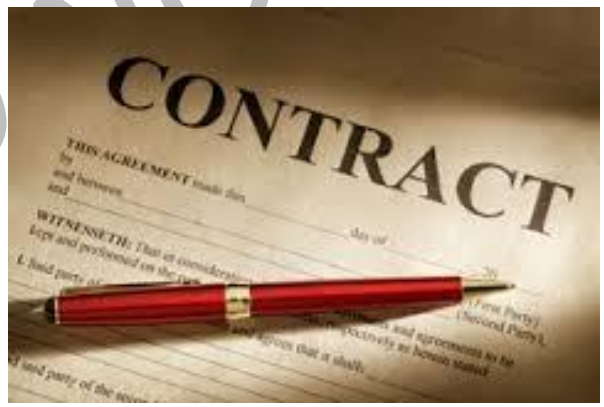
- need to operate within fairly severe budgetary and procedural constraints and must therefore always strive for cost containment efforts.

- deals with some of the methodologies which are available to senior managers for effective management of procurement activities, especially purchasing and value analysis.

- **Selection of Sources of Supply**

- It is impossible to provide high quality, low cost health care delivery without satisfactory suppliers of consumable items .

- Consequently, one of purchasing paramount responsibilities is to establish and maintain a satisfactory group of suppliers.



- Materials management department must take three important supplier-oriented actions :

1) Reward and motivate satisfactory suppliers by placing with them annual supply contract.

2) Eliminate unsatisfactory suppliers especially who do not supply on time, supply with out dated and spurious medicines, large materials are received in damage form.

3) Develop new suppliers especially with innovative technology, performing the test at very high speed – spiral CT SCAN, who provide free demonstration of their items and also give training to the concerned hospital staff, free of cost.

- Selecting capable suppliers.

- If the supplier is selected, then only one expects to get competitive pricing, reliable quantity, on-time delivery, good technical service.

- The purchasing department of a health unit should motivate its suppliers to participate in a mutually profitable buyer-seller relationship.

- a continuing relationship permits the vendor to learn the intricacies of health care delivery system and vice-versa.

- As relationships develop the supplier can typically reduce his direct selling effort.

- may reduce prices by meshing together the operations of both supplier and the health services.

- in a government set up a purchase committee is formed , who looks after these technical, operational, administrative hurdles in the procurement of various hospital inventories.

- ***Usually the most important measure of a supplier's service is his past record of performance in previous transactions.***

- increasing attention is being paid to determine objective standards and procedures to evaluate and compare existing suppliers.

- Two simple evaluation techniques will be highlighted, i.e. The Weighed-Point method.

- For example, it is often desirable to use the following evaluation criteria :
  1. Quality of shipment
  2. Adherence to delivery promises
  3. Frequency of cost reduction suggestions
  4. Price of goods

- In the case of A category items such as anti-cancer medicines, immunosuppressant to be used in post renal transplant patients.

- A suggested point ratings system may be as follows :

1. Quality 40 points,
2. Delivery-30 points,
3. Cost Reduction Suggestions-20 points
4. Price-10 points.

- Result of the ratings

1. Excellent-84 points to 70 points
2. Unacceptable-69 points and below.

- An important advantage of this method is that any number of evaluation factors can be included and relative weight ages can be assigned.

- ***The Cost Ratio Method*** tries to relate all costs associated with purchasing and receiving to the value of the consignment.

- The higher the ratio of the cost of transportation / shipment values, the lower the rating applied to the customer.

- However, as a general rule, quality, delivery and price are the usual ones.

Table 1

Composite Rations for the Weighted - POI

Item no.	Total Shipment Received	Per cent age Accepted	Quality Rating (% x 40)	Percent age on schedule	Delivery Rating (% x 30)
Vendor A	110	90	36	80	24
Vendor B	60	80	32	90	27
Vendor C	50	70	28	100	30
	Average Price / Unit Rs.		Lowest Price to Actual Price		Price Rating
Vendor A	40		40/40		10
Vendor B	50		40/50		8
Vendor C	60		40/60		7
	Quantity (40 points)		Composite Rating Comparison		
			Delivery (30 points)	Cost Reduction (20 points)	
Vendor A	36		24	4	
Vendor B	32		27	4	
Vendor C	28		30	12	

- **Value Analysis :**

✓ cost reduction is a useful indicator of a vendor's involvement in the purchasing process.

✓ implies the development of a continuing long-term relationship with major suppliers by the health care delivery system.

✓ All the care given to the needy patients in a corporate hospitals are according to price they pay to get the service from the hospital.

✓ Thus the quality of treatment is equivalent price value, they pay to get that quality of the service.

Objective of Value Analysis:-

- The objective of all value analysis activities is the procurement of materials representing the 'best buy' in terms of the function to be performed.

- this will involve an understanding of the cost that is being incurred to obtain a certain function from a **product presentation**, particularly for the health care industry .

- for example, the use of holmium laser in urology.

- The cost of treatment is based on the technology involved .

Advantages of Value analysis with example

1. Advantages of the use of laser in the treatment of urological procedures are
- bloodless surgery,
- short duration of stay,
- up to 150 gm of prostrate can be enucleated by transurethral route,
- no need for blood transfusion makes superior to the conventional surgical procedures,

- But due to the involvement of costly and sophisticated instruments, it increases the cost of the treatment .

3. Value analysis can be a useful tool for operational functional analysis' with respect to systems and procedures.

- In a major hospital, the materials management department was concerned at the fact that relatively high levels of manpower were being used in the department.

Purchase order monitoring and expediting	38 per cent
Vendor evaluation and selection	20 per cent
Purchase order preparation	15 per cent
Purchase parts documentation	6 per cent
Invoicing and collection	4 per cent
Quality inspection activities	7 per cent
Other activities	10 per cent

Checklist for value analysis:

1. Can the item be eliminated?
2. If the item is not standard, can a standard item be used?
3. Does the item have greater capacity then required?
4. Can the weight of the item be reduced?
5. Is there a similar item in inventory which can be substituted?
6. Is 'commercial quality' possible to be used? (Commercial quality is usually most economical).
7. Is the item properly classified for transportation purposes to obtain lowest freight costs?
8. Can the cost of packing the reduces?
9. Are the suppliers being asked fro suggestions to reduce costs?
10. Can costs be reduced through change in materials or ordering quantities?

Quality Assurance :-

- Quality is the inherent characteristic and distinctive attribute that makes a product different from others.
- It ensures conformity to requirements.
- For examples by allopathic, unani, homeopathic, auryvedic, system of medicines, should be essentially free from defects, thereby becoming cost-effective.
- In India, awareness of quality standards began with the establishment of Indian Standards Institution (ISI), now renamed as Bureau of Indian Standards (BIS).
- Quality of health care institution is judged by QUALITY COUNCIL OF INDIA.
- Accreditation of HCO as NABH & LABORATORY by NABL accreditation , helps to give quality of patients care.

The International Standards Organization (ISO)

- The International Standards Organization (ISO) with its headquarters at Geneva maintains standards of manufactured goods and products within and outside the industry.
- The ISO 9000 series are norms aimed at documentation of procedures which define precepts, guidelines and processes to maintain discipline and quality management practices.
- Where design of the product is involved, ISO 9001 is required.
- If the design is already established, then ISO 9002 would apply, which means activity of production, installation and servicing is in conformity with the requirements.
- ISO 9003 is applicable only when capability is demonstrated in the field of final inspection, for example final demonstration of pneumatic drill, automated external defebilitator, DC shocks machines etc to be demonstrated.

Purchasing / procurement:

In purchasing the right quality of materials, the following considerations are significant :

- Determination of quality
- Defining it properly and clearly
- Controlling it through some methods

The consideration of quality of the material has direct relationship to the

- Technical suitability,
- Physical availability (how easily , its spares part is available in local market especially in the cases of repairs& maintenances)
- Economic consideration of price (how much cheap it is as compared to its price in other countries, for examples consider ting the price of USG machines in Indian market and comparing its cost in western world).

Quality Monitoring :

- In medical and health services, very often one error cannot only be dangerous but fatal, The goals of zero error and zero delay should dominate every person every minute of the day.
- This means that steps must be taken to prevent errors of any sort either in the acquisition (procurement of hospital materials & instruments such operating microscopes, pulse oximeter etc) or in the utilization of materials (use of DC shock machines, used in the revival of the patients with atrial fibrillation etc) used for patient care.

Three examples for the results of such errors will illustrate the gravity of the problem.

- **Case 1 :** A man in a general ward suffering from emphysema falls from his bed, and breaks a bone. Four days later he is shifted to another room where there is provision to put him on oxygen. An oxygen cylinder or tank is rolled out, and he is connected to it. Within 15 minutes, he is dead. The cylinder continued carbon dioxide (CO_2) and not oxygen (O_2).

- **Case 2 :** A girl suffering from pains enters the emergency room of a hospital. She is presumably given Phenobarbital mixed with some other drugs. Cocaine is kept in a locked cabinet in bottles very similar in appearance to those of Phenobarbital. The cocaine bottle is grabbed instead of the correct drugs. The girl went into convulsion and they give her another drug that only hastens her death.

- **Case 3 :** A paramedical centre with a health care unit has an oxygen supply system. It out sourced to a private company to keep it supplied with oxygen cylinder. After two patients die and another becomes critically ill, an examination shows that a cylinder of argon was connected to the system, not a cylinder of oxygen.

Analysis:

- In all these institutions, the fatal errors can be related to 'poor' quality of the medical.
- which in turn is a reflection of inadequate quality assurance and / or monitoring systems with respect to the materials used.
- In this case, on inspection of a storage system, which substitutes argon for oxygen, which stores carbon dioxide and oxygen together .
- does no label them properly, which allows cocaine and Phenobarbital to be stored close to each other in similar looking bottles in the same cabinet, is obviously a totally unacceptable one from the quality point of view.
- There is common problem for starting wrong blood transfusion which can lead to fatal and life threatening complication.

- For purposes of monitoring, controlling and assuring ‘product’ or ‘materials’ quality, the definition of quality is ‘a measure of how closely a good or service conforms to specified to those related to the physical characteristic of the materials.

- they also relate to standards to usage such as safety, storage, maintenance, inspection etc.

- After all, merely controlling incoming quality of items is useless, if during administration of the materials or product, such as a drug or oxygen, the quality of service provided to the consumer, in this instance, the patient, leaves much to be desired.

- **Materials Management System in a District Health System**
  Materials Inputs and Quantity Planning

- The primary objective of a sound health care delivery system is the provision of appropriate levels of preventive treatment

1. to the community at level
2. at all levels of society,
3. at optimal cost
4. without compromising in any way the quality of the services rendered.

- The attainment of this goal is facilitated by a clear understanding of the role of materials management .

- the performance of daily activities at all levels in the organization, be it the District Health centre or the Primary Health Care Unit.

- Using all resources in the most efficient way

- More specifically, proper adjustment of resource utilization levels under constraining situations

- Significant cost savings can be achieved by an integrated approach to quantity planning for all materials consumed by the Health Care Delivery System.

Activities which appear to hold high potential for significant cost improvements at all levels in the organization are :

1. More sophisticated price negotiations. (for example use the concept of e-business, & e-tender)
2. Effective use of economically sized orders.(use the concept EQO)
3. Attainment of volume-based price discounts when possible. (value analysis / ABC analysis)
4. Determination of correct sizes of inventory at proper levels in the supply hierarchy.
5. Control of inventory damage, waste and obsolescence.

6. More efficient use of storage space.

7. Improvement in accuracy of inventory records (error rate below 5 per cent).

8. Minimization of materials handling costs by conducting materials flow analysis.

9. Improvement in paperwork, processing and manpower utilization by utilizing methods studies and process analyses of materials management operations. (use of computers in MMD)

10. Improved training of all health care personnel in materials management. (training in the field of market analysis, health economics, international business transactions.

- **Storage Methods and Simple Control Procedures :**

When a new stock is received, divide it into two parts that can be labeled A and B and can be placed separately on two shelves.

i. Place part B in s sealed plastic bag or bind it in some way and place it on the bottom shelf. Level it 'not to be used until new order is sent'. This is a reminder.

ii. When part A on the top shelf is finished, send off the new order.

iii. Start to use part B. by the time is finished the new stocks will have arrived. It would work if supply time is ½ the procurement interval. If the supply time is longer, a much larger stock must be kept and part B must be larger than part A.

- **A prescription for Good Materials Management :**

  Material management performance in a health care setting centers around four basic goals:

  - To have materials on hand when needed.
  - To pay the lowest possible prices, consistent with quality and value requirements for purchased material.
  - To minimize inventory investment.
  - To operate efficiently.

“Deming Cycle” and its relevance to material management :

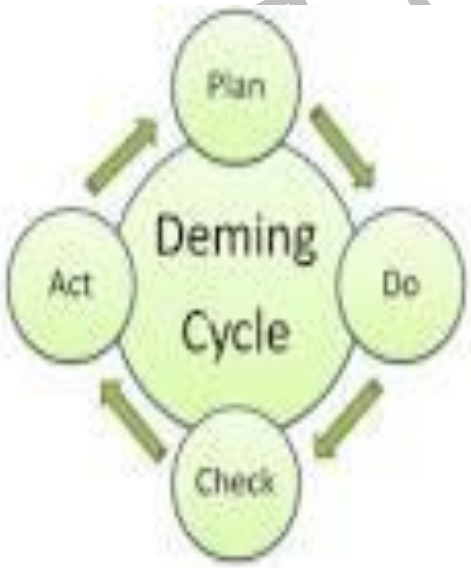
- It is, necessary to look for continuous improvements such that these goals can be attained in a smooth manner and through the team efforts of the doctor, the nurse, the pharmacist, the patient.

- In addition, a continuous error prevention programme must be in place, so that wages, pilferage and potential disasters such as mix-up of medicines, oxygen and carbon dioxide cylinders etc. are avoided.

- All these can be achieved using the so-called ‘Deming Cycle’, proposed by the famous management expert W.E. Deming, the man mainly responsible for bringing quality management to Japan, whenever it is decided that something be done, we must begin with a plan, work procedures or the plan are revised depending upon what is at fault.

- Proper materials control can be achieved through this prescription, viz. control is a continuous cycle beginning and ending with planning.

- The PDCA cycle is incomplete unless each individual step is carried out
- Some of the materials management techniques outlined in this section can be selected to achieve this goal. This is the P component of the cycle.
- These procedures are set in motion and are practiced for a few weeks: this is the D component.



- Subsequently, the results are reviewed (the C component) and necessary action initiated to modify of change the techniques if the initial target of 10 per cent reduction in stock outs is not achieved (the A component).

- The cycle starts all over again. If, however, the target has been reached, the either the effort should be renewed to improve further, say for both A + B category drugs by 20 per cent, or to create a new target for improvement, say, organization of the storage system

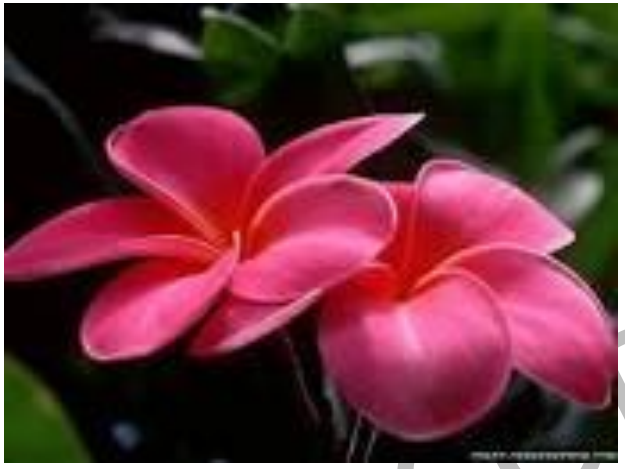
- All we have to do is to keep a constant eye on a few things so as to achieve effectiveness in the matter of management material.
- These are

(a) Raising the order at the right time for the right quantity to the right source, and

b) Developing a suitable system that almost automatically helps us to spot what needs be done at any point in time.

Further the objective with respect to materials and their management must be clear and well defined in our mind so as to be able to develop appropriate operational goals and develop execution strategies.

In the medical field , a hospital and medical administrator must understand the urgency of the different drugs and hospital equipment used in handling the emergency and life threatening condition , like one used in ICCU, CCU, NICU, emergency operation theatre, burns unit etc and always keep additional fund to procure these items.



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