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A Study on the Selective Controls of Inventory Management And Application of ABC XYZ Control Matrix in the Cardiology Department of A Tertiary Care Hospital.

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I. Introduction

Heath care demand and supply cannot be left to be regulated solely by the invisible hand of the market. Nor can it be established on considerations of utility maximizing conduct alone[6]. Materials management is an important issue for healthcare systems because it influences clinical and financial outcomes[7]. Hospital materials management (HMM) also involves the clinical sphere of healthcare service performance[7]. The item list changes from hospital to hospital, depending not only on the healthcare services managed, but also on the physician's expertise and preferences, and following pharma co-economics principles[8] Effective and efficient of inventory management system can affect supply chain management significantly to improve cycle service levels and reduce costs[1] Organizations should ensure that they take specific actions to optimize the inventory level with the minimum total annual inventory cost and they implement the actions consistently. But, to determine which actions are the right ones for the organization, they first carry out the detailed analysis of the inventory. The results of the analysis can be used as a basis for defining the appropriate inventory optimization measures[2]

Classification of selective controls

Type of control	Basis	Main use
Abc [always better control/ pareto's law]	Value of consumption of items concerned [it has nothing to do with unit value of the time]	To control raw material components and WIP of business
HML [High, Medium, Low]	Unit price of the material [opposite to ABC]	To control purchases
XYZ	Value of items in storage	To review the inventory, their uses etc. at scheduled interval
VED [vital, Essential, Desirable]	Critically of the items	To determine the stocking levels of spare parts
FSN [Fast moving, Slow moving and Non moving]	Consumption pattern of the items	To control obsolescence
SDE [Scarce, Difficult and easy to obtain]	Problems faced in procurement	Lead time analysis and purchase strategies
GOLF [Govt.Ordinary,LocaForeign sources]	Sources of supply	Procurement storage
SOS [Seasonal and Off seasonal]	Nature of supplies	Procurement and holding strategies for seasonal items like agricultural products.
PQR	Shelf life of items	To have control over items based on their expiry dates.

Need for the Study:

It is not uncommon for us to hear that a life saving drug was not available in a particular hospital or several other items became obsolete due to overstocking. Management by Objectives (MBO) concentrates on identifying key result areas and performance standards and 50 percent of these are usually covered by 20 percent of his activities.

Cardiology department contributes a major share to the revenue generated by the hospital. Most of the revenue generated by the department is due to the procedures performed in the cath lab and hence was selected for the study.

Objectives:

1. To classify the items in cath lab stores into A,B and C category depending upon their value of consumption and suggest procedures to be adopted to control A,B and C items.
2. To classify the items in cath lab stores into X Y and Z category based on the closing stock as on 31/03/2016.

II. Methodology

The study was carried out in the Cath lab stores of Nizam's institute of medical sciences, a tertiary care teaching hospital.

A retrospective study of the data of cath lab stores during the period of April 1, 2015 to March 31, 2016 was done.

The following information was gathered from the stock records.

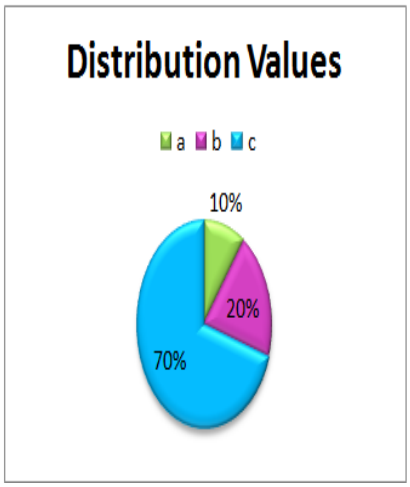
- Opening & Closing balance of stock
- Issues & Receipts
- Price of individual items

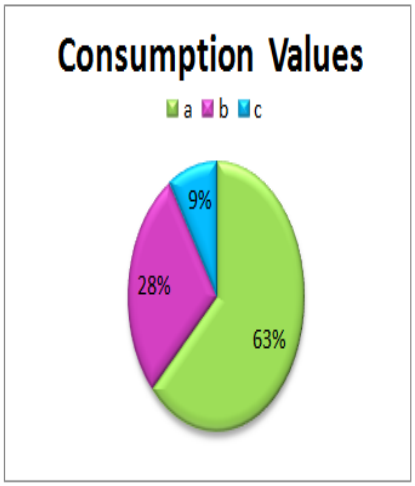
Data collected was entered and analyzed in Microsoft Excel.

Observations and analysis:

Distribution values of consumption of Cath lab stores Inventory

S.no	Items	Class of items	% of items	Value of Cons	Cons value%
1	18	A	10	56313839	63
2	36	B	20	25165853	28
3	124	C	70	8019606	9
Total	178		100	89499298	100





ABC analysis:

ABC analysis is an important tool used worldwide, identifying items that need greater attention for control [2]. Before an inventory management is done, an ABC classification is usually undertaken [4]. ABC analysis is a method of classifying items according to their relative importance. It is also known as "separating the vital few from trivial many" [3]. ABC analysis identifies the drugs requiring stringent control for optimal use of funds and elimination of out-of-stock situations in the pharmacy [5]

Selective Control Procedures for ABC Items

CONTROL	A-ITEMS	B-ITEMS	C-ITEMS
Type of control and Authority	Very strict control.	Moderate control;	Low control, powers can be delegated to the user department.
Quantity of safety stock	Very low or practically nil, safety stock combined with frequent ordering and/or staggered supplies	Low safety stock ordering can be done monthly or quarterly	High safety stock and bulk ordering half yearly or annual orders to take advantage on bulk discounts
Consumption control	Regular – weekly or daily	Fortnight or a month	The period can be extended to a quarter
Material planning	Material planning should be accurate and data base should be up to date	Past consumption can be used a basis for plans data can be 10 to 15days old	Rough estimates are sufficient and data can lag behind by a month
Applications of value analysis	A concerted attempt should be made at value analysis, waste, reduction, obsolete and surplus reduction	Moderate attempts are sufficient	Annual reviews sufficient
Numbers of sources of	Increase the number of	2 or 4 reliable	1 or 2 reliable sources,

supply	sources, centralize purchase and stores and reduce lead time	sources combined purchase with moderate attempt to reduce lead time	Annual or Half yearly purchases. Decentralized and reduce clerical work
Lead time reduction	Maximum efforts should be made to reduce lead time	Moderate efforts	Minimum clerical efforts
Centralized vs. Decentralized	Centralized purchasing	Combination purchasing	Decentralized purchasing
Priority	High priorities in all activities for procurement stage	Normal processing with high priority only when critical	Lowest priority

Advantages of ABC Analysis

1. This approach helps the Materials Manager to exercise selective control and Focus attention only on a few items when he is confronted with lakhs of items.
2. By controlling 'A' items and doing proper inventory analysis obsolete stocks are automatically pin pointed.
3. A B C analysis helps to rationalize number of orders and reduce average inventory.
4. It prevents wasting of time and energy in making improvements, where improvements yield marginal benefit ('C' class items)
5. It reinforces concepts of management by exception theory.

Limitations of ABC Analysis

1. ABC analysis, in order to be fully effective, should be carried out with standardization and codification.
2. It indicates nothing about their profitability or critically, importance to an item is given on the basis of its consumption value and not on criticality. Hence such a classification can lead to overlooking the need for spare part, whose critically is high but consumption value is low.
3. ABC analysis should be reviewed period1ically
4. The limitation of ABC analysis is that it is based only on monetary value and the rate of consumption of the item. In a hospital, an item of low monetary value and consumption may be very vital or even lifesaving.

XYZ analysis

The total closing stock value for each item is arranged in descending order The cumulative total closing stock value is computed for each item.

As shown in the table

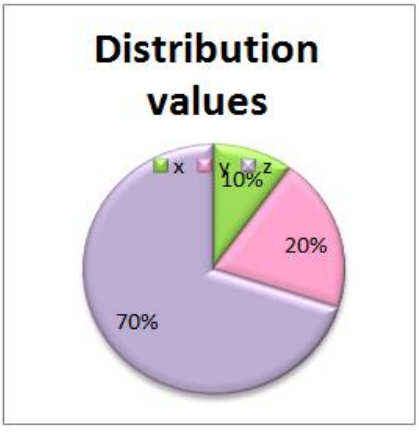
X Class items: 10 % of items contributing 59% of the total closing stock value

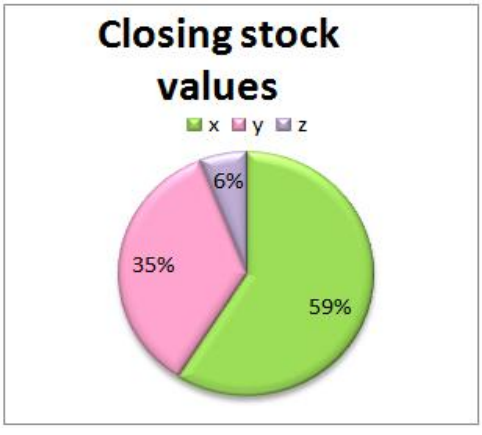
Y Class items: 20 % of items contributing 35% of the total closing stock value

Z Class items: 70 % of items contributing 6% of the total closing stock value

Distribution of Stocks in the stores as on 31/03/2014

No of Items	Class of items	% of items	Total closing stock value.	Total closing stock value %
7	X	10	1560865	59
14	Y	20	925382	35
52	Z	70	167623	6
73		100	2653870	100





While ABC classification has the value of consumption as the basis, XYZ has the value of inventory stored as basis. The study is undertaken once a year at the time of annual stock taking. X items are those items whose stock values are high, while Z items are those items whose stock values are low. As expected, Y items fall in between two categories X and Z. This classification helps in identifying the items, which are being excessively stocked. If the management is caught napping, one can expect 'C' items in X category. Therefore ABC and XYZ controls in conjunction will help the managers to have better control.

Control Matrix for ABC and XYZ Items

Class of Item	X-Items	Y-Items	Z-Items
A-Items	A critical analysis is needed for reducing the stocks.	Attempts must be made to convert these items to 'Z' category	Items are well under control.
B-Items	Consumption and stock control must be reviewed more frequently.	No further action in control may be necessary.	May be reviewed half yearly.
C-Items	Action can be initiated to dispose off excess stocks.	Controls should be tightened.	Can be reviewed annually.

XYZ analysis helps to control obsolescence. It tells how the values are distributed amongst materials in stores. The procedure to carry out XYZ classification is very simple. After annual stock taking, the closing stock values of items are arranged in descending order according to their values. The cumulative totals are entered against each item. The descending number of item is found as percentage of total value of all items in stores.

ABC and XYZ Control Matrix

		X	Y	Z
A	No of items	4	1	1
	Value	1059235	24660	15840
B	No of items	2	0	2
	Value	501630	0	0
C	No of items	0	13	49
	Value	0	900722	151783

III. Conclusion

The common sense approach to solving any problem is to tackle important aspects more rigorously. Similarly in inventory management, classification is adopted so that a major portion of effective managerial time is spent on those materials, which are more important. The motive behind any selective control is that equally detailed analysis of all items is very expensive. Moreover such a concentration on all items will have diffused effect regardless of the priorities. Selective inventory control can indicate where the manager should concentrate his efforts.

Peter F. Drucker, states that "One must look to the area where the results are, not where work is".

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