

**Summer Training at
Wockhardt Hospitals Ltd., Nagpur
(April 3 to June 2, 2017)**

**Study on Inventory Management at Wockhardt Superspeciality Hospital,
Nagpur**

**By
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**Under the guidance of
Brig. (Dr.) S.K. Puri**

**MBA Hospital & Health Management
2016-2018**


**Institute of Health Management Research
The IIHMR University, Jaipur
2017**

CERTIFICATE

This is to certify that Mr./Ms. Jasleen Saluja has undergone summer training in (Organization name Wockhardt Hospital,) from 3rd April to 2nd June 2017.

The candidate herself/himself completed the project assign to his/her during summer training. Her approach to the project was sincere and proactive. This summer training is in partial fulfillment of the course requirement recommended for the award of MBA in Hospital and Health Management.

I wish him/her success in all her future endeavors.


Col. (Dr.) Ashok Kaushik

Dean (Academic & Student Affair)

The IIHMR University, Jaipur The IIHMR University


Name of the Mentor
Prof. S. C. Gaur (Retd.)
Designation
Advisor

June 03, 2017

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. Jasleen Saluja** (Student of IIHMR University, Institute of Health Management Research, Jaipur) has successfully completed his Summer Training from **03/04/2017 to 02/06/2017**

During her aforesaid tenure, she has been found to be extremely honest, regular and sincere.

For Wockhardt Hospitals Ltd.,



Abhijeet Pagade
Dy. Manager-HR



ACKNOWLEDGEMENT

Any idea is not revolutionary or feasible enough, if it's not supported, improvised or trimmed enough before its implementation. A single page is not sufficient enough to thank all those people who helped me during the course of the summer training, but a few important contributors do worth a mention.

I feel deeply privileged in expressing our deep sense of gratitude to Dr. Anupam Verma (President), Dr. Clive Fernandes' (Clinical Director), Dr. Sujatha.K (Centre Head, Nagpur) Wockhardt Group of Hospitals, for their expert guidance and encouragements which helped in the process of making this report. Without their support exploring such a vast organization could not have been possible.

I sincerely thanks **Mr. P. Santosh** (HR Head), **Mr. Abhijeet Pagade** (Deputy HR), **Dr. Rajesh Gade** (Deputy Manager – Quality) who were extremely busy with their duties took time out to guide me.

“An Endeavour over a period can be successful only with the advice and support of a mentor. I express my deepest thanks to my mentor **Mr. Amit Mukherjee**, (Head of Materials Department), Wockhardt Hospitals for guiding and supporting me

I am also thankful to all the department heads and staffs for helping me in spite of their busy schedule

It's my pleasure to place on record my best regards, deepest sense of gratitude to my guide **Dr. S. K. Puri**, IIHMR University, Jaipur for his valuable guidance which were extremely helpful for my study.

I owe a debt of gratitude to all my teachers for grooming me and my colleagues for the inspiration needed to work with dedication and motivation.

Last but not the least, I would like to thank all my batch mates of MBA-HM 2016-18 for being there through thick and thin and making this summer training a great learning & memorable experience.

Dr. Jasleen Saluja

1. ABBREVIATIONS

FSN- Fast, Slow and Non- Moving

VED- Vital, Essential, Desirable

GOLF- Government, Open market, Local, Foreign

SOS- Seasonal and Off Seasonal

HML- High, Medium, Low

SDE- Scarce, Difficult, Easy

OT – Operation Theatre

ICU- Intensive Care Unit

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2. ORGANIZATIONAL PROFILE

The Institution

Wockhardt Hospital's presence is the result of a 40-year old generation of caring and innovation offered by it; it is considered to be the India's 5th largest Pharmaceutical and Healthcare Company.

Wockhardt Hospitals has become a leading healthcare service provider with its presence in the Western parts of the country i.e. Mumbai, Nagpur, Rajkot, Nasik and Surat. Group of 9 hospitals achieve the need of the people in its field of super specialty like Cardiology, Orthopedics, Neurology, Gastroenterology, Urology, Aesthetics and Minimal Access Surgery.

Wockhardt group of hospitals has accreditation of the NABH (National Accreditation Board of Hospitals & Healthcare), the highest and the most stringent quality standards institution in India and the National authority in healthcare accreditation. To meet these standards the hospital needs to have a quality driven approach right from the patient registration, admission, pre-surgery & post-surgery protocols, discharge from the hospitals to follow ups after discharge.

Partners Medical International (a non- profit organization) serves as a catalyst in bringing together healthcare professionals from around the globe towards improving the delivery of healthcare through education and implementing its vision that every citizen of the world should have access to quality healthcare in their own country.

MISSION AND VISION

Wockhardt Hospitals believe that the core values of excellence, respect, teamwork, integrity and caring are essential for the wellbeing of our staff and our patients and this is evident in the vision and mission of our hospitals.

2.1 VISION

"Wockhardt Hospitals generally strive with excellence to fulfill the needs of the people in its field of medical treatment"

2.2 MISSION

"To serve and enrich the quality of life of patients suffering from diseases, through the efficient deployment of technology and human expertise, in a caring and nurturing environment with the greatest respect for human dignity and life"

2.3 HISTORY

“**Wockhardt Hospitals** was introduced on 28 August 1991 under the Companies Act, 1956 as a public limited company. It was originally named **First Hospitals and Heart Institute Limited**. On 11 September 2000 the name was changed to Wockhardt Health Sciences Limited and subsequently on 19 October 2000 the name was changed to **Wockhardt Hospitals Limited**”

Wockhardt Hospitals are one of the tertiary care super specialty healthcare networks in India offering healthcare services. The chain of hospitals is owned by the parent company Wockhardt Ltd., India's 5th largest Pharmaceutical and Healthcare company with a presence in 20 countries across the globe.

“Founder Chairman and Group CEO **Dr. Habil Khorakiwala** founded Wockhardt in 1967. Today the Wockhardt Group is India's leading research-based global healthcare enterprise with relevance in the field of Pharmaceuticals, Biotechnology, Active Pharmaceutical Ingredients (API) and Super Specialty Hospitals”.

2.4 UNITS HISTORY

WOCKHARDT HEART HOSPITAL, NAGPUR

Wockhardt Heart Hospital, Nagpur was inaugurated in 2004, till date being the first hospital in the city to perform Angiography by the Radial method. They have full-time expert team of cardiologists and cardio-surgeons to run their cardiac services. A well-established ICU ensures timely care in cardiac emergencies. It is supported by skilled and qualified nurses and advanced technology. Presence of 50 beds, two Cardiothoracic Operation Theatres, a Cardiac Catheterization Lab and a Dedicated Cardiac Ambulance, they also have a 24-Hour Emergency Heart line. All the services are supported strongly by advanced technology. The Lab also comprises of the Philips Integris HM2000 with C-arm geometry, HF generators, High Resolution II/TV system, Digital Imaging System, and a CD recording system. The system is equipped for high resolution angiographies. With its heavy-duty tube, it is a work horse for angioplasties stenting procedures and other interventional vascular procedures.

WOCKHARDT SUPERSPECIALITY HOSPITAL, NAGPUR

Wockhardt Super Speciality Hospital, Nagpur was founded in 2007 on the basis of two decades of experience in high-end Super Specialty care, Wockhardt Super Speciality Hospital, Nagpur was established as pioneer on the basis of the trust of the people of Central India, which has ensured that the already existent cardiac hospital at Nagpur crosses expectations thereby facilitating accreditation with NABH.

The citizens of Central India can now avail of Super Speciality medical care in the areas of Neurology, Neurosurgery, Orthopedics, Minimal Access Surgery and Critical Care, along with the services in the fields of Urology, Nephrology, Surgical Oncology, Endocrinology, Gynecology, Pediatrics, Emergency Care and Preventive Healthcare already available in Nagpur.

Wockhardt Super Speciality Hospital, Nagpur is the preferred healthcare destination for patients in areas such as Akola, Amravati and from the neighboring states of Chhattisgarh and Madhya Pradesh.

2.5 SCOPE OF SERVICES

- Bariatric Surgery
- Cardiovascular Thoracic Surgery
- Cardiology and Vascular Surgery
- Critical Care
- Emergency medicine
- ENT
- Gastroenterology
- General medicine
- Gynecology
- Kidney Transplantation
- Medical Oncology
- Minimal access surgery
- Nephrology
- Ophthalmology
- Orthopedics
- Pediatric Cardiac Surgery
- Plastic Surgery
- Psychiatry
- Respiratory Medicine
- Surgical Oncology
- Urology

2.6 FLOOR DIRECTORY

Level 0	Physiotherapy Department Emergency Department
Level 1	Main Reception Outpatient Billing OPD No. 1 to 11 ECG/TMT/ECHO Radiology Department In patient billing TPA Desk Pharmacy Phlebotomy (sample collection)
Level 2	Cath lab Cardiac ICU OPD No. 12 to 23 EEG/EMG Administration Department IT Department
Level 3	Medical ICU Cafeteria Library Relative waiting lounge
Level 4	Laboratory Dialysis Bed No. 401 to 446 Medical Records Department

	Biomedical Department
Level 5	Bed No.501 to 532 CSSD Blood storage centre Play room Relative waiting lounge
Level 6	Operation theatre Surgical ICU Endoscopy Main Store



PROJECT REPORT

A STUDY ON INVENTORY MANAGEMENT AT WOCKHARDT SUPERSPECIALITY HOSPITAL, NAGPUR

Project Guide

Mr. AMIT MUKHERJEE

(Head of Materials, NAGPUR)

4 MATERIALS DEPARTMENT

Material department is an essential part of the hospital. Materials play a essential role in smooth running of the hospital. It provides materials to all the other department of the hospital in form of consumables, stationery and other items required by the user department

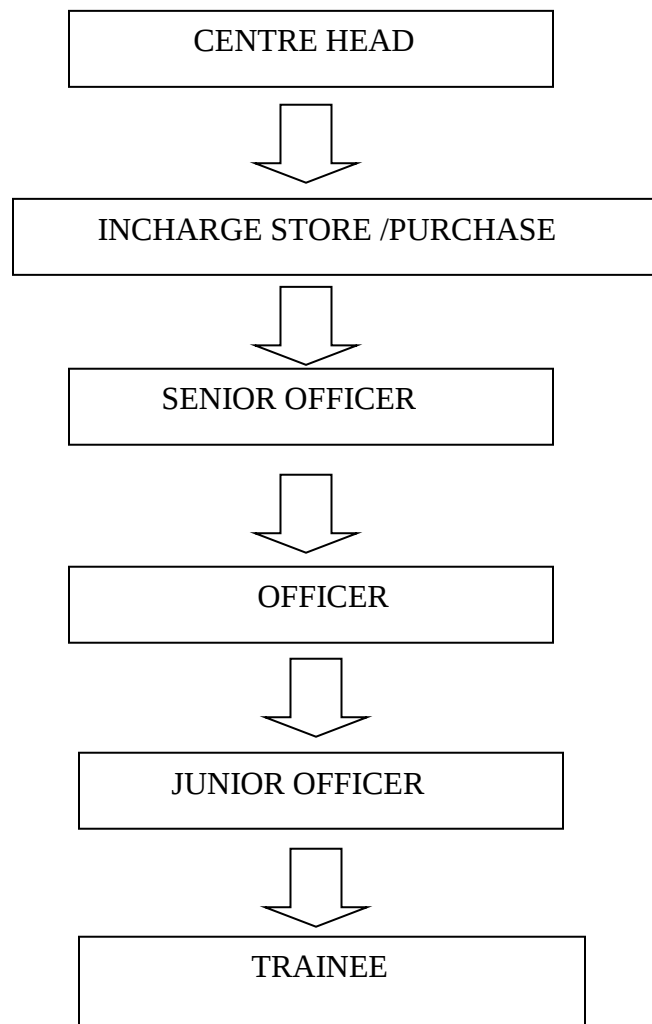
4.1LOCATION

- Materials department (Store) is located at the 6 level of the hospital.
- There is total of five persons in the department

4.2TIMING

- 6 days a week
- 9:30am -8:30 pm

ORGANIZATION STRUCTURE OF MATERIALS DEPARTMENT



4.3PURPOSE

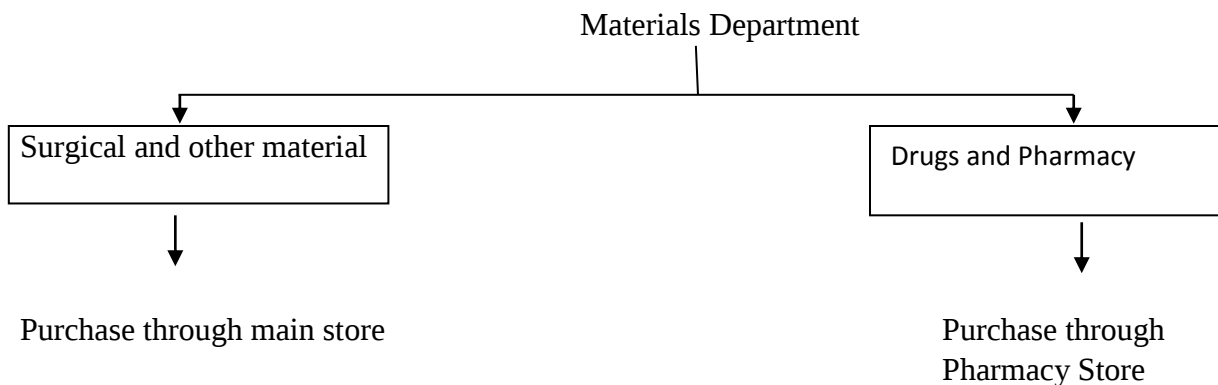
The main purpose of the material department is as follows-:

- To purchase excellent quality material at reasonable price in the most economical manner.
- To provide uninterrupted materials to the user department.
- To maintain lowest inventory.
- To ensure timely payment to the supplier

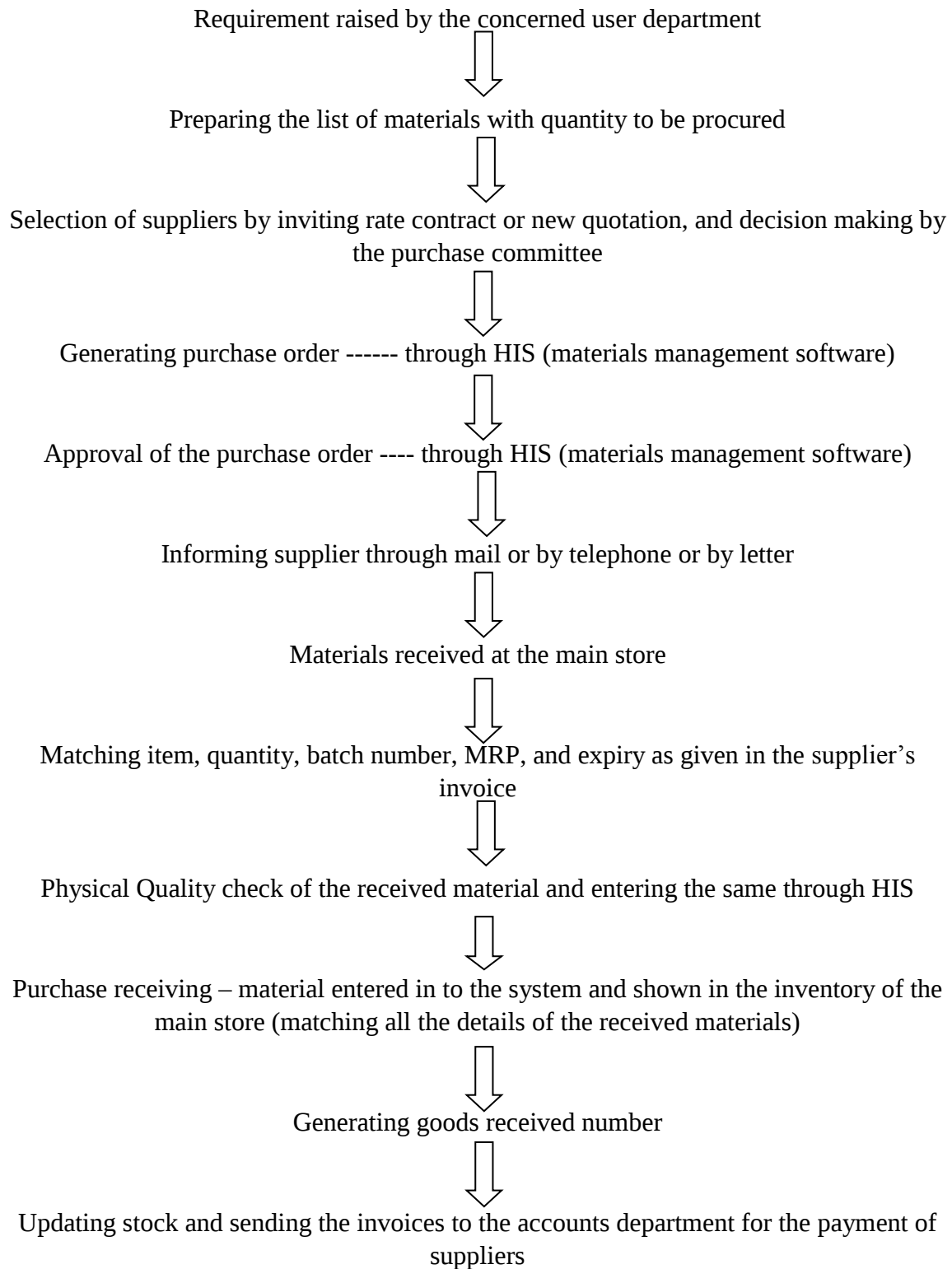
4.4SCOPE

- Materials planning
- Purchasing
- Incoming materials check
- Inventory control
- Proper storage and preservation of materials
- Material handling and transportation
- Maintenance of all the records.
- Cost reduction through standardization, variety reduction.

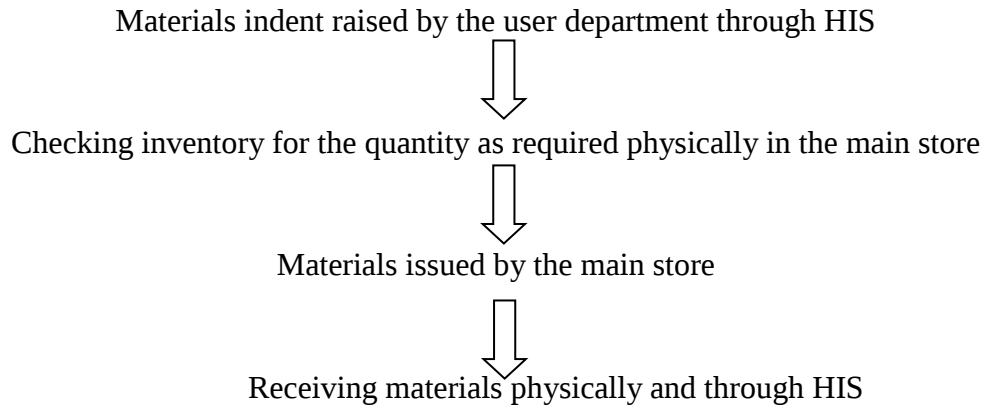
4.5PROCESS



a) Procuring materials



b) Issuing materials



c) Usage of the material and charging

Materials are stocked at various sub stores-:

- OT store
- Ward (level 4 & 5) store
- Cath lab store
- SICU store
- MICU store
- Emergency store
- Endoscopy store
- Pharmacy

5. INTRODUCTION OF INVENTORY MANAGEMENT

Hospitals are composite service organizations providing major number of services to the patients, physicians and staff. Every area has specific material demand creating a need in these areas for supply chain management system that can provide the appropriate materials when needed. In the current situation of rising cost of healthcare, inventory must be optimized without sacrificing critical care of services provided to patient for saving life.

Materials constitute a major cost component in healthcare industry. The total cost of materials may constitute of 27-30 percent of the total cost. The goal of the materials management is that materials are available at their point of use when needed hence efficient procurement. Inventory consist one of the major components of current assets, which allows smooth running of an organization. “Inventory management is that part of current asset management, which is mainly related with maintaining optimum investment in the materials and applying effective methods so as to reduce the total inventory cost”.

6. DEFINITION

“Laysons and Gillingham (2003) in their book, purchasing and Supply Chain Management (6th edition) , defined Inventory as an American accounting term for the value or quantity of raw materials, components, assemblies, consumables, work in progress and finished stock that are kept or stored for use as need arises”.

“Rick Lavelly (1998), defines inventory as a pile of money on the shelf and profit for the company or organization”

7 TYPES OF INVENTORY MANAGEMENT TECHNIQUE

The different types of inventory are-:

ABC Analysis

The ABC analysis is used to classify inventory based upon the consumption value of the material. It is also known as “Selective Inventory Control”. ABC analysis categorized as:

“A items” should have tight inventory control and accurate records.

“B items” with less tightly control and good records.

“C items” is the simplest of all and should have minimum records

VED Analysis

The VED analysis is generally performed by classifying the items into vital (V), essential (E) and desirable (D) categories. It is very useful to categorize items of spare parts and components.

FSN Analysis

In FSN analysis items are grouped according to their rate of consumption in the hospital. The items are broadly classified into three groups

- F- stands for Fast Moving
- S – stands for Slow moving
- N – stands for Non-moving

It is generally observed that the hospital generally maintains a huge stock of non-moving items that block quite a lot of capital. Fast and non-moving items helps in arrangement of stocks in the store and their distribution and handling methods.

HML Analysis

Items are classified as high, medium, and low based upon their consumption. The HML analysis is very close to the ABC analysis, the difference among them is the usage value. In this method the price criteria are used. In this method the items are arranged in descending order of their unit price after that organization decide decides a cut off line for deciding the three categories.

SDE Analysis

SDE stands for Scarce, Difficult and Easy. It attempts to classify items on the basis of its availability and procurement.

- Scarce
These items are usually short in supply, or are supplied through government agencies.
- Difficult
These items are available aboriginally, but are difficult in terms of procurement. “Difficult” categorization also includes those items which are generally procured from places that are usually far from our place and suppliers cannot be trusted upon. In order to procure such items in time for production, the organization should place order well in advance
- Easy
These items are easily and readily available. These are those items which are generally purchased locally without any difficulty.

SOS Analysis

SOS analysis is generally depending upon the seasonality of items available and it classifies all the items into two categories

- Seasonal
- Off seasonal

SOS analysis can be done when we want to determine the seasonality of items and the right season for procuring them.

GOLF Analysis

GOLF categories items based upon the nature of suppliers. The nature is fixed or determined on the basis of quality of suppliers, lead time of supply, terms of payment, continuity and regularity of supply, extent of administrative work involved in the procurement

- G group covers all those items which are procured from government suppliers, namely State Trading Corporation, minerals and metal trading corporation. In this supplier involves a long lead time. Many times, suppliers demand advance payment for the goods to be purchased.
- groups comprise those items which are procured from the non-government organization. In this category the supplier deliver items in moderately reasonable rate
- L group consist of those items purchased from local suppliers. These items generally consist of cash purchases.
- F group consist of items purchases from foreign supplier

8. LITERATURE REVIEW

Before beginning the explanation about inventory management, it is important to define clearly some concepts. As stated in Ballou (2004). “Supply chain management is the integration of all activities in association with the flow and transformation of goods from raw materials up to final user, as well as all the information flows, through improved supply chain relationships, in order to achieve a sustainable competitive advantage.”

“Inventories are stock piles of raw materials, supplies, components, work in process and finished goods that appear at numerous points throughout a firm’s production and logistics channel” (Ballou,1998). “Inventory management is a set of techniques and methods employed to assure in each moment, in the best economic conditions, the conservations of raw materials, availability for the user” (Lebas,1961)

According to Butters and Eom (1992), “the supply management system in healthcare industry is one of the prime areas where cost reductions are a predictable outcome. However, supply chain management in this industry is more complex than in other industries, because of the impact on people’s health requiring adequate medical supply (Beier, 1995). Healthcare providers believe that they cannot predict patient mix and the demand for a particular item; hence they are not able to control or project their schedule, unlike managers in the manufacturing industry.” (Jarret, 1998).

Quoted by Lapierre and Ruiz (2005), “there is one approach defending the coordination and scheduling of all the logistics processes in order to have all the resources available without over inventory. Furthermore, although procurement and inventory management are non-value adding activities in hospitals (Apteland Pourjalali , 2001); these activities are required since the nature volume of items needed on daily basis are difficult to predict (Jarret, 1998). As the healthcare practitioners have been stung by breakdowns on distribution, they prepare these items by stockpiling supplies (Saccomano, 1996), due to the liability incurred by the death of a patients. So, the healthcare industry’s supply chain problems will not stop with poor inventory control” (Jarret, 1998).

9. RATIONALE

Inventory management is a critical, or essential, component of the hospital. Efficient and cost effective clinical care to the patient can only be possible if there is sufficient amount of Drugs and Consumables in the hospital. Hence inventory should be managed judiciously to prevent stock outs.

10. AIM

- To make inventory management cost efficient and minimize stock outs.

11. OBJECTIVES

- To analyze the stock and classify the items based upon their consumption
- To apply appropriate Inventory control tool for optimum utilization of the Inventory.
- To reduce the inventory holding days from 30 days to 15 days by setting the reorder level of each item.
- To access the current status of the Inventory Management.

12. LIMITATION

- Two-month time was not enough to analyze the yearly consumption of the consumables and drugs in the hospital.
- As the GST is about to be implemented there would slight change in ABC analysis due to different taxing pattern.

13. RESEARCH METHODOLOGY

- **Study Area:** Wockhardt Superspeciality Hospital, Nagpur
- **Study Duration :** 1st January 2017 - 31st March 2017
- **Sampling technique:** Convenience Sampling
- **Sample size :** All the consumables and drugs from January 2017 to March 2017
Main Store = 1761 Consumables and Drugs.
OT store = 666 Consumables and 169 Drugs.

ICU Store = 199 Consumables and 316 Drugs.
Wards Store = 166 Consumables and 564 Drugs.
Emergency Store = 96 Consumables and 7 Drugs.
Dialysis Store = 12 Consumables and 90 Drugs.
Endoscopy Store = 30 Consumables and 15 Drugs.
Cath Store = 185 Consumables and 59 Drugs.
Pharmacy = 12 consumables and 1511 Drugs

- **Study content -**

- All the drugs and consumables at the Main Store.
- All the drugs and consumables at sub store of Operation theatre, Emergency, Cath lab, Dialysis, Endoscopy, Wards level 4 and 5 and Pharmacy.

- **Type of study:**

- The Study Design used for this project is Descriptive Retrospective Study.
- The Data was closely observed and analyzed.

- **Data collection Technique:**

- **Secondary Data:**

- Information about the Drugs and Consumables were taken from the Material Management System of the Hospital and mathematically calculated as A, B and C items.
- Observing the data which was analyzed using Microsoft Excel

14. ANALYSIS

Data analysis was done by using Microsoft Excel 2007

a) DEPARTMENT WISE STOCK ANALYSIS

The department wise projected stock analysis of the Consumables from duration of 1st January 2017-31 March 2017 was done with actual stock

The stock analysis was done with the help of Microsoft Excel 2007

Steps involved in stock analysis

- As we have to reduce the inventory holding days from 30 days to 15 days, the 3 months data was converted into 15 days by certain mathematical calculation.
- The 3 months data of each item of consumables was converted into 1 month by dividing it by three.

- Then the 1-month data was further converted into per day consumption by dividing it by thirty
- Finally, per day consumption was multiplied by 15 to get the projected stock consumption of the all the consumables of main store and sub store.
- Then the projected stock of 15 days of each item as taken as a sample for the study was multiplied by its unit price and total cost of each department was calculated.

b) **REORDER LEVEL**

After department wise stock analysis was done the reorder level of each item was calculated.

“Reorder Level (or Reorder Point) is the inventory level at which a company would place a new order or start a new manufacturing run”.

formula:

Reorder level = Minimum level (safety level) + (Lead time * Per day consumption)

The 3 months data was analyzed and reorder level of all the drugs and consumables of the Main store and sub store was set in the HIS system of the hospital.

The list is very large I could not include each and every item in the report. As an example that how, I proceeded with my analysis, instead showing a part of it

For example: -

3 months consumption of a particular item is =277

1-month consumption = $277/3 = 92.3$

Per day consumption= $92.3/30 = 3.08$

15 days consumption (Maximum) = $3.08*15 = 46$

Minimum = $7 * 3.08 = 21.5$

As per the formula stated above:-

$$\text{Reorder level} = 21.5 + 1 \times 3.08$$

$$= 24.6$$

c) ABC ANALYSIS

The ABC analysis is a method used in to classify the inventory based upon the consumption value. The classification depends upon following factors:

- “A items” should have tight inventory control and maintain accurate records.
- “B items” should have with less tightly control and maintain good records
- “C items” is the simplest among the three and minimum records should be maintained

It is also named as “**Selective Inventory control**”.

It is based upon Pareto Analysis (80/20).

The ABC analysis provides a method for identifying items that will have a major impact on the overall inventory cost.

The ABC approach states that organization should classify items from A to C depending upon following rules.

- **A –items**

The items with annual consumption value the highest. The top 70-80 % of the annual consumption accounts for only 10-20% of the total inventory items

- **B-items**

These items have medium consumption value, the 15-25% of the annual consumption accounts for 30% of the total inventory items.

- **C –items**

The items with the lowest consumption value, 5% of the annual consumption value accounts for 50% of the total inventory items.

The annual consumption value is calculated with the formula-:

$$(\text{Annual demand}) * (\text{item cost per unit})$$

Steps for classification of these items

- Unit cost of each item and the usage of each material over a given period was retrieved from the given data.
- Then the unit cost was multiplied by the estimated annual usage to obtain the net value of each item.
- Listing all the items was done and they were arranged in descending order based upon the consumption value
- Accumulate the value and add up number of items and percentage was calculated on total inventory in value and in number
- A range is set for categorizing each item based upon the consumption cost. The consumption cost above 50,000 is A category, 40,000- 20,000 is B category items and below 20,000 belongs to C category.
- Finally categorize the items as A, B and C items for optimum utilization of inventory.

	Percentage of items	Percentage value of annual usage	
A items	20%	80%	Reviewed daily
B items	30%	15%	Monthly reviewed
C items	50%	5%	Quarterly reviewed

15. RESULTS

As per the sample the projected stock was compared with actual stock using mathematical calculation of the all Consumables of Main store and sub store.

This table mainly depicts the department wise stock analysis of Consumables used in the hospital

DEPARTMENT	ACTUAL STOCK	PROJECTED STOCK	DIFFERENCE
ICU	234992.36	223377.9583	11614.4017
CATH STORE	480664.61	528211.3	-47546.69
DIALYSIS	47375.42	9845.56	37529.86
EMERGENCY	784577.55	17444.445	767133.105
ENDOSCOPY	224572.28	6611.331667	217960.9483
MAIN STORE	2426296.05	2520960.717	-94664.667
WARDS	131977.91	468675.565	-336697.655
OT STORE	685624.83	922405.1567	-236780.3267
PHARMACY	162249.62	1874.745	160374.875

DEPARTMENT WISE CONSUMABLES STOCK ANALYSIS

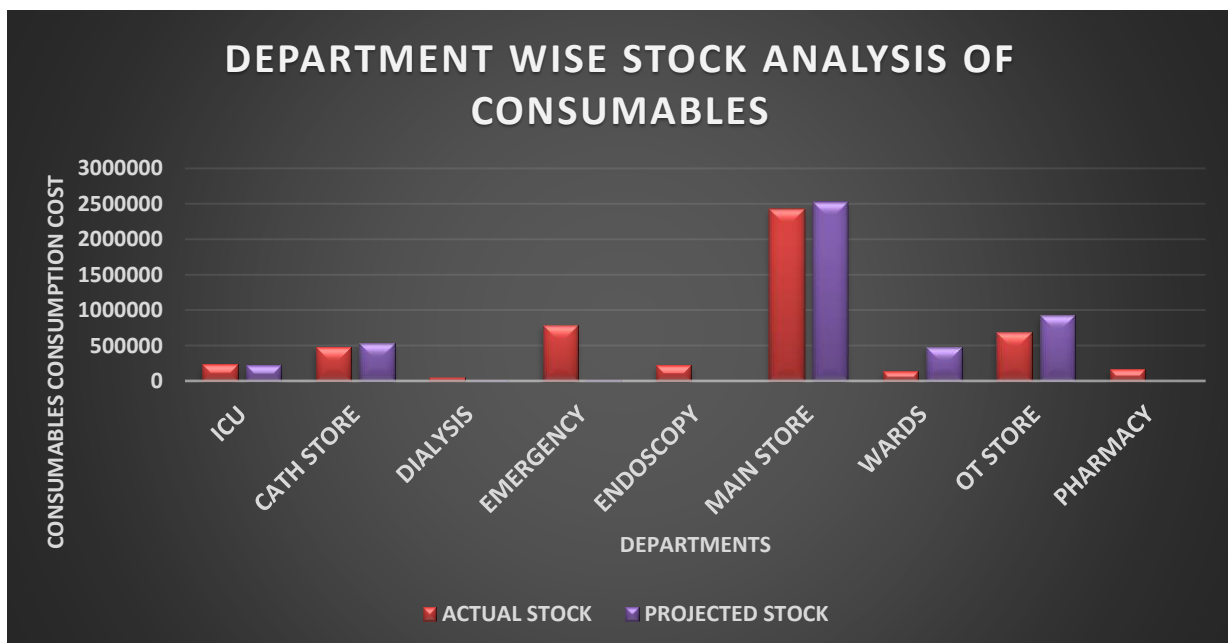


Figure 1 – Department wise stock analysis

As per the above table the stocks were compared and following points was observed-

- The numbers highlighted mainly depicts that the stock present in the Main Store, OT store, wards and Cath Store is less. So appropriate reorder level must be set in these stores to avoid stock outs and for smooth running of the organization
- To overcome this problem the reorder level of each item was set in Material Management System of the Hospital.
- Maximum and minimum level was calculated and further the reorder level was calculated using the formula.
- Departments like ICU, Endoscopy, Emergency, and Pharmacy the actual stock was quite high in value in compared to the projected stock required in the store. This means that stock was quite high, and the appropriate method was not used for ordering the items

ABC ANALYSIS

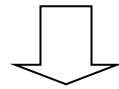
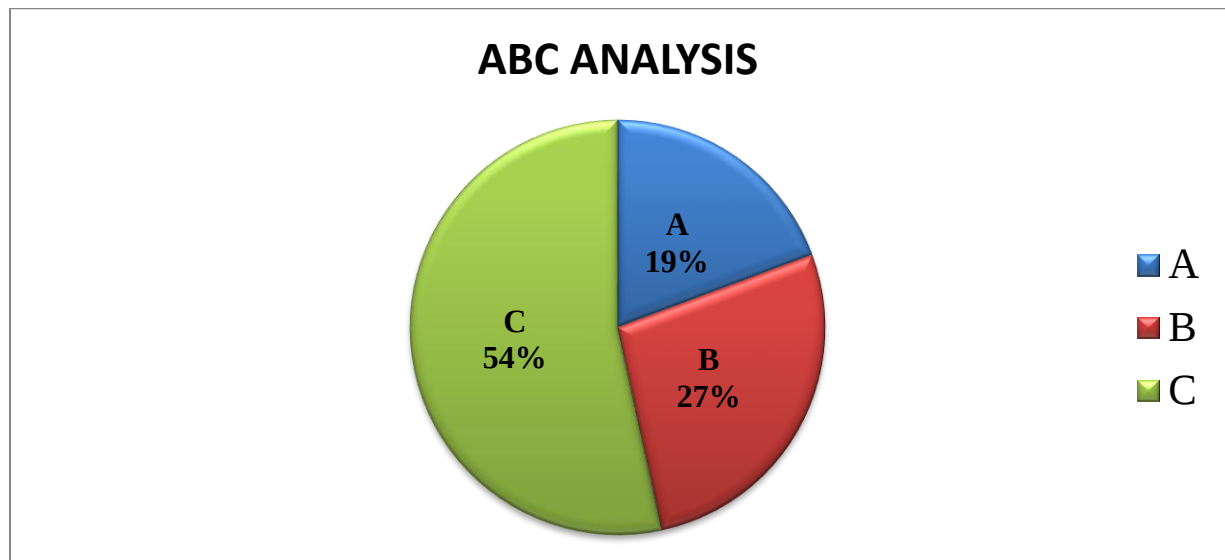
ABC Analysis of 1760 items was done. The findings are as follows –

A items are those whose consumption value is above 50,000

B items are those whose consumption value is between 40,000- 20,000

C items are those whose consumption value is 20,000 or below.

	ABC ANALYSIS	
340 Items	A Category	19%
480 Items	B Category	27%
940 Items	C Category	54%



19% of **A Items** contributes to
80% of the total cost

27% of **B Items** contributes to
15% of the total cost

54% of **C Items** contributes
5% of the total cost.

Figure 2- ABC Analysis

16.CONCLUSION

Materials Department is responsible for supply of right amount of item to the patient on right time, failing to this can be lethal for patient and hospital image. Materials department is also responsible to maintain adequate amount of inventory to minimize cost and increase efficiency of available space to maintain adequate inventory at minimum cost

Inventory should be categorized

For A items, orders should be placed frequently and lead should be less as possible to prevent stock out

For B items the sufficient stock should be maintained, orders are to be placed less frequently.

Safety stock must be maintained in order to avoid stock out condition and help in continuous production flow.

17.SUGGESTION

- **A items**

Items in this category should be tightly controlled because these items have the highest consumption value. Reorder should be frequent and should be closely monitored for avoiding stock outs.

- **B items**

B-items is an intermediate among between A and C. These items should monthly monitored

- **C items**

Reordering of these items should be made less frequent. A policy should be set that only one unit on hand should present and reordering should be done only when normal purchase is done. These items can also be bought on challan basis.

- To reduce the inventory holding days from 30 days to 15 days the appropriate reordering method should be implemented.
- Indent should be done on 15 days basis rather than weekly basis to reduce workload

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- **Materials management system of the Wockhardt hospital, Nagpur**