STUDY TO CATEGORIZE AND MANAGE INVENTORY IN NARAYANA MULTISPECIALTY HOSPITAL, JAIPUR

Internship Training
at
Narayana Multispeciality Hospital, Jaipur

By
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Under the guidance of
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MBA Hospital & Health Management
2013–15

Institute of Health Management Research
Jaipur
2015

INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Pragya Sharma student of MBA Hospital and Health Management from IIHMR University, Jaipur has undergone internship training at Narayna Multispecialty Hospital, Jaipur from 1st March, 2015 to 8th May 2015.

The Candidate has successfully carried out the study designated to him during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all his future endeavors.

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9th May 2015

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. Pragya Sharma** has successfully completed her internship in the department of Supply Chain Management and has successfully completed her projects on

1. A study to categorize and manage Inventory in Narayana Multispecialty Hospital,Jiapur
2. Study on Turnaround Time of drug dispensing in IP pharmacy
3. In Patient pharmacy: A study to analyze and reduce quantity of stock out items.

From 1st March 2014 to 8th May 2015 in Narayana Multispecialty Hospital Jaipur.

During the internship her character and conduct was good.

For Narayanaya Multispeciality-Jaipur

Vishnupriya Sharma
Sr. Manager-Human Resources

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INSTITUTE OF HEALTH MANAGEMENT RESEARCH, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled "A study to Categorize and manage Inventory in Narayana Multispecialty hospital, Jaipur", submitted by Dr. Pragya Sharma Enrollment No. 1476 under the supervision of Dr.Susmit Jain for award of MBA Hospital and Health Management of the university carried out during the period from 1st March, 2015 To 8th May, 2015. Embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Pragya 12/5/2015
Signature

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I again express my heartiest gratitude to all the persons who helped me throughout my work.

Dr. Pragya Sharma

"A study to Categorize and manage Inventory in Narayana Multispecialty hospital, Jaipur"

By Dr. Pragya Sharma

Abstract

Basic objective of material department is to get right goods, at right price, at right time to maintain desired services level at minimum cost. Material stores functions in order to supply the right material in right quintiles at the right time at the right price. The key performance indicators for materials department is no stock outs, zero errors in maintenance of accounts, zero error in billing processing, maintain minimum inventory maximum efficiency.

Introduction:-

About one-third of the annual hospital budget is spent on buying materials and supplies, including medicines. The goal of the hospital supply system is to ensure that there is adequate stock of the required items so that an uninterrupted supply of all essential items is maintained. ABC analysis is a method of classifying items or activities according to their relative importance. It is also known as "separating the vital few from the trivial many" because, for any group of things that contribute to a common effect, a relatively few contributors account for a majority of the effects.

VED analysis is based on critical values of the item. Based on their criticality, the items could be classified into three categories: vital, essential and desirable. There could be serious functional dislocation of patient care services in hospital when vital drugs are not available even for a short period. If essential items are not available beyond a few days, the functioning of the hospital can be adversely affected. The shortage of desirable items would not adversely affect patient care or hospital functioning even if shortage is prolonged.

A combination of ABC and VED analysis (ABC-VED matrix) can be gainfully employed to evolve a meaningful control over the material supplies. Category I includes all vital and expensive items (AV, BV, CV, AE, AD). Category II includes the remaining items of the E and B groups (BE, CE, BD). Category III includes the desirable and cheaper group of items (CD).

Aims:

To make inventory management cost efficient and minimise stock outs.

Objectives:-

1) To analyse the stock movements in stores.
2) To analyse the consumption trend for determining the rank of items on the basis of their consumption.
3) To establish safety stock level, lead time, reorder level.

Analysis:-

Only 1.2 % item belongs to A-V category and class-1(A-V, B-V, A-E) category accounts for 8.73% of total medical consumables. While class-2 (C-V, B-E, A-D) category accounts for 29.31% of total medical consumables. Rest of the items belongs to class-3.

Conclusion:-

Materials department is responsible for supply o right amount of item to patients on right time, failing to this can be lethal for patient and hamper hospitals 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 class-1items, orders should be placed frequently and lead time should be as less as possible, to keep inventory level low and prevent stock out.

For class-2 items, 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.

TABLE OF CONTENTS

Acronyms/Abbreviations

BSI – Blood Stream Infection

CAUTI – Catheter Associate Urinary Tract Infection

CCU – Cardiac Care Unit

CSSD - Central Sterile Services Department

CTVS – Cardiothoracic and vascular surgery

CVP line - Central Venous Pressure Line

FGW – Female General Ward

HDU –High Dependency Unit

HAI – Hospital Acquired Infection

HK - Housekeeping

IC Sheet – Infection Control Sheet

ICD – Infection control Department

IPD – In patient Department

ITU – Intensive Therapy Unit

JCI – Joint Commission International, USA

MGW – Male General Ward

MICU – Medical Intensive Care Unit

NH – Narayana Health

NICU – Neonatal ICU

VAP – Ventilator Associates Pneumonia

1. ORGANIZATION PROFILE

Narayana Health, one of India's largest and World's most economical healthcare service providers is set to emerge as a global industry model for its ability to reconcile quality, affordability, scale, transparency, credibility and sustainable profitability. Equipped with all super-specialty and tertiary care facilities that the medical world has to offer, it is now a one-stop destination for any healthcare requirement a common man needs. No one is refused treatment due to lack of funds. From a humble beginning of a 300 beds hospital in 2001, Narayana Health has grown to a 6000 beds health care conglomerate in 2013 with 17 hospitals present in 13 locations within the country.

Famous for its cost-cutting approach in many ingenious ways, NH has been ranked 36th among "WORLD'S 50 MOST INNOVATIVE COMPANIES" by Fast Companies in2012.

In India, where accessibility to good healthcare facility still depends on one's economic status Dr Devi Shetty founder of Narayana Health bring a revolution in the health sector.

Vision-

To provide, “Affordable quality health care to the masses worldwide”.

Mission:

We at Narayna Hrudayalaya have a dream, “A dream of making quality health care available to the masses worldwide”.

Quality policy:

“Narayana Hrudayalaya is committed to provide professional patient care at a affordable cost to reach patient globally with holistic approach and continually improve the effectiveness of quality management system”.

Quality Objective:

- Provide holistic, timely patient care.
- Continually upgrade the knowledge and technique in patient care.

- Customer relationship management.

Values-

Narayana Health's Core Values are defined by I – CARE

Innovation and efficiency – to continuously reduce cost of delivery of high quality health care and improve reach

Compassionate Care – in providing accessible care that makes a difference to our patients

Accountability – to honor our commitments with integrity and transparency to our patients, employees and investors

Respect for all – recognize the contribution of every employee and respect rights and dignity of every patient and employee

Excellence – create a culture of individually excelling to collectively ensuring highest quality of consistent, reliable service to our patients and sustainable value to all our stakeholders

Brand……

Narayana Health:

NARAYANA in Sanskrit means the preserver of the universe which matches with the NH ethos of being committed to the health of every life

Colour:

BLUE is the colour of calm, peace and cure… Leaf is a symbol of life

NH:

NH does not have any gaps in between as there is no space for discrimination while catering to the health needs of every individual

3 Leaves:

The THREE LEAVES three core values of NH – Compassion, Quality, Affordability

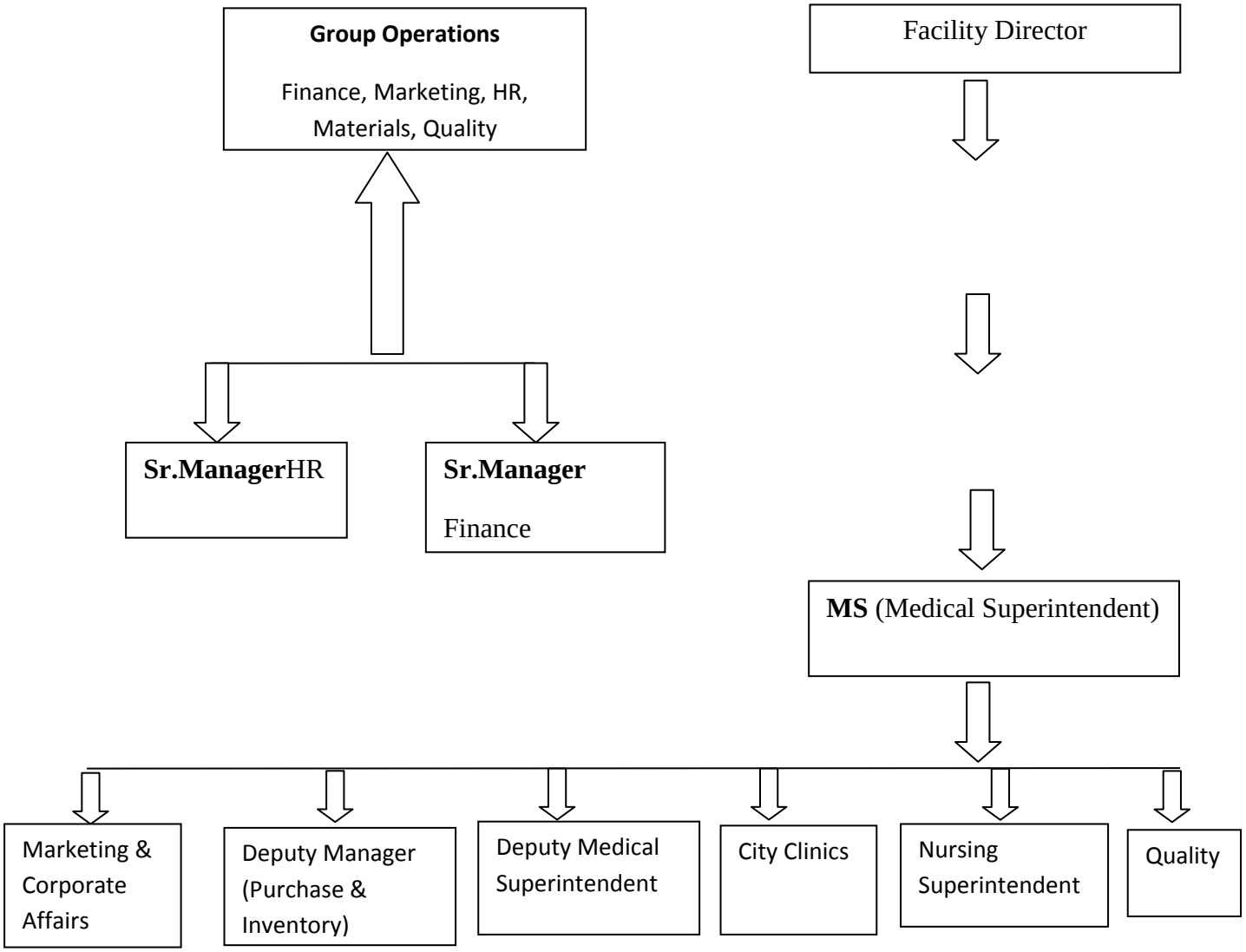
Sunrise:

The SUNRISE behind the letters NH marks a new dawn in healthcare that Narayana Health is trying to bring about

Narayana Multispecialty Hospital, Jaipur

Narayana Multispecialty Hospital, Jaipur was commissioned on 29th of January 2011. In 26 July 2012, the hospital was awarded the international accreditation from Joint Commission International (JCI) making it the first hospital in Rajasthan to receive this prestigious recognition. The 200 bed multispecialty tertiary care hospital is located at Pratap Nagar within a sprawling campus of 4.7 acres. Specialties at the hospital include both adult and pediatric cardiac services, orthopedics, obstetrics & gynecology, neurosciences, nephrology, urology and gastroenterology offering advanced treatment procedures including Laparoscopic and Minimally Invasive surgeries. Hospital has in-house Radiology, Laboratory and Blood Bank services offering Emergency and Trauma care.

ORGANIZATIONAL STRUCTURE



DEPARTMENTS & SERVICES:-

1. Cardiology and cardiac surgery
2. Neurosciences
3. Nephrology and urology
4. Gastroenterology
5. Orthopedics and joint replacement
6. Trauma care and emergency services
7. Critical care
8. Mother and child care
9. Pulmonary medicine
10. plastic surgery, cosmetic & reconstructive surgery
11. Internal medicine
12. Diabetes & endocrinology
13. Physiotherapy & rehabilitation center
14. Nutrition
15. Radio diagnosis and imaging
16. Pathology & microbiology
17. Comfort, safety and supportive care

HOSPITAL INFRASTRUCTURE

1. Basement
    - Biomedical Engineering
    - CSSD
    - MRD
    - Radiology & Imaging (X-Ray, MRI , Ultrasound, CT scan)
    - Purchase & Main Store
    - Linen
    - Mortuary
    - Central security office
    - Male Medical Ward
    - Male Surgical Ward
    - Human Resource Department
    - Administration Offices
    - Cafeteria and Food Court
    - Conference Room
    - Accident and emergency
    -
2. Ground floor
    - Main Reception
    - Admission Counter
    - Discharge and Billing
    - OP And IP Pharmacy
    - Prayer Hall
    - ATM
    - Central Report Collection Centre
    - MICU & CCU
    - OPD
    - Catha Lab
    - Blood bank
    -

3. First Floor
    - Operation theatre
    - Female medical ward
    - Female surgical ward
    - NICU
    - PICU
    - Paediatric ward
    - ANC Ward
    - CRIB
    - Semi private ward
    - ITU
    - Dialysis unit
    - Physiotherapy
4. Second floor
    - Private ward
    - CTVS

DEPARTMENT IN THE HOSPITAL

The following departments function in the hospital

Clinical Services	**Clinical support services**	**Clinical Administrative Services**	**Administrative services**
Accident & Emergency	LABORATORY MEDICINE	Ambulance services	Human resources
OPD	Imaging	Nursing department	Materials
Anaesthesia	CSSD	Food & beverages	Marketing
Critical Care	Biomedical waste	Security	Finance
OT	Housekeeping	Mortuary	Engineering
IPD	Pharmacy	Laundry	IT

Material Department

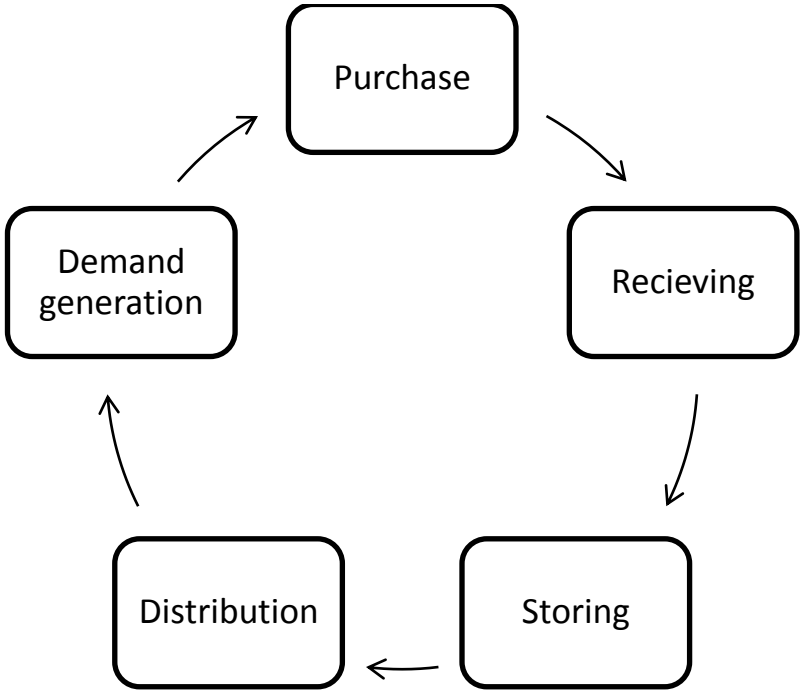
Basic objective of material department is to get right goods, at right price, at right time to maintain desired services level at minimum cost. It has 4 sub units:-

I. Purchase unit
II. Receiving unit
III. Main store
IV. Sub stores-
    a. In Patient pharmacy
    b. Cath lab Store
    c. OT store
    d. OPD Pharmacy

Material stores functions in order to supply the right material in right quintiles at the right time at the right price. The IP departments put up requests for the required materials by uploading indents in the HIS. The store manager raises a purchase order to be sent at the central procurement stores. The supplies received are inspected on the basis of quantity and expiry in the incoming material inspection area. The items are stored as per the storage norms. Departmental issues are made for non – medical consumables as per requirement. Stock is reviewed periodically for non-moving items and short expiry items. Stock audits are carried out twice/year. Any variance is reported to the higher management. For inventory control, ABC and VED analysis is carried out. FEFO (first expiry first out) is followed.

The key performance indicators are no stock outs, zero errors in maintenance of accounts, zero error in billing processing, maintain minimum inventory maximum efficiency, maintaining stores as per the NABH = ISO standards, submission of bills accounts within 4 working days, expired items on the shelves should be zero, minimize emergency purchase, TAT suture and lab kits (19 days), instruments (8 weeks) and other items (2 days).

Functions of material department:-



Purchase:-Purchasing of an item requires administrative, financial and technical approval. For purchasing any item department has to raise purchase order (PO). PO incorporates conditions of supply including time schedules and to seek an acknowledgement from the vendor firm.

Receiving:- At the time of delivery, verification of each item is done physically and count against suppliers invoice or challan, and bill is certified and forwarded to account department for prompt payment

Storing:-After receiving, items are transferred to main store. In main store GRN (goods receiving note) prepared and items are transferred to sub stores and wards according to demand generated by respective store except high alert medicines, which are stored in main store.

Distribution:- From the sub stores items are distributed to ward, Cath lab, and operation theatre according to demand generated by receiving side.

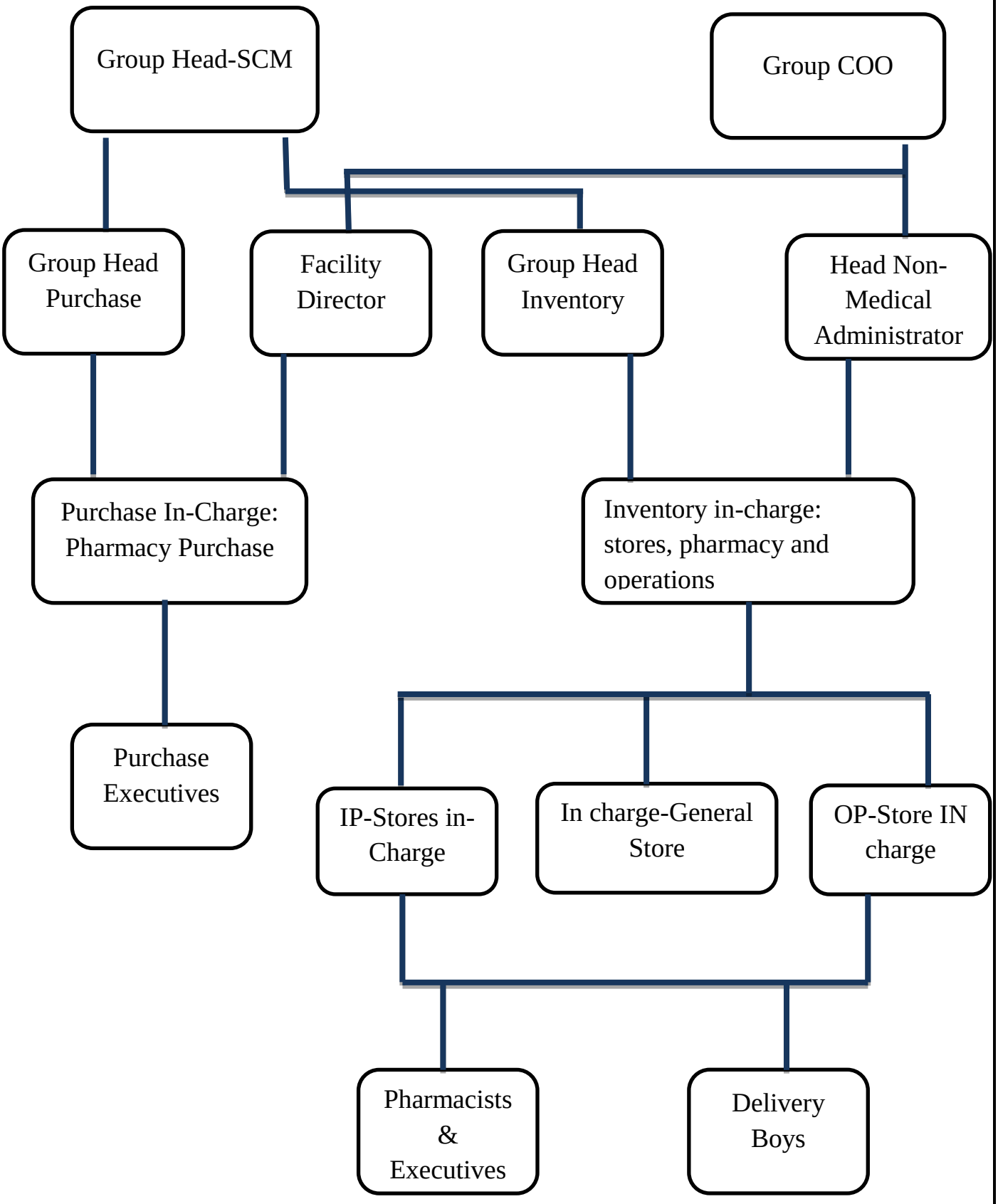
Demand generation:- Demand is generated in two ways:-

a. Periodic demand
b. Emergency demand

Periodic demand is generated twice a month which is identified with the help of tool named MSQ (minimum stock quantity) and on the basis of consumption pattern of last 2 month.

Emergency demand is generated for drugs which are not present physically and required urgently.

Organization Structure of Material Department:-



In Patient Pharmacy Store

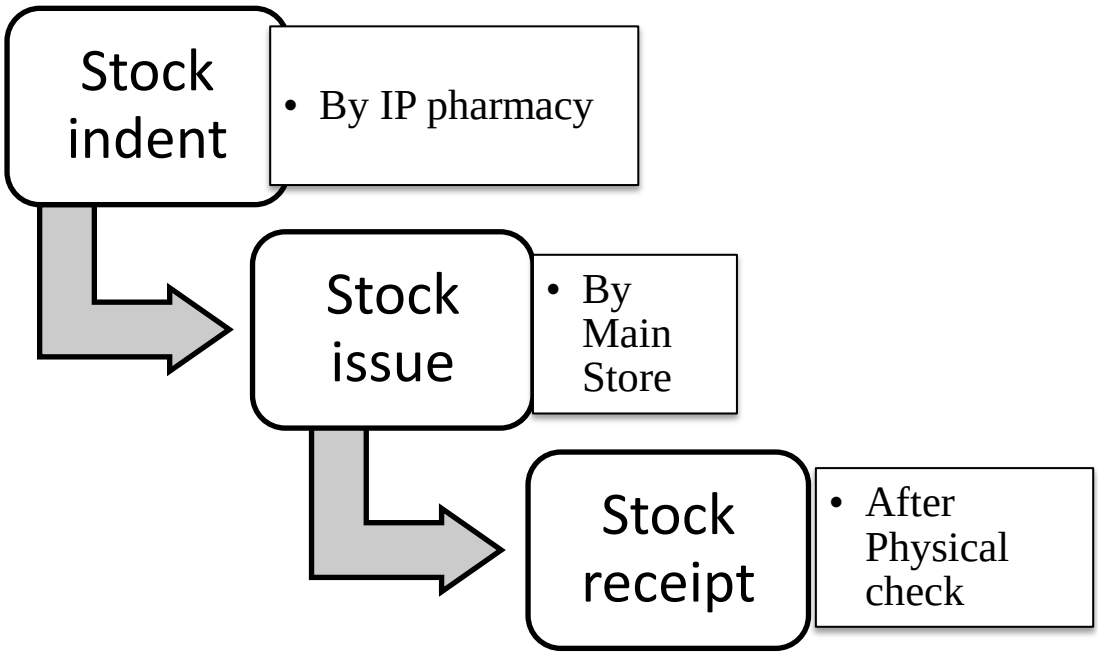
The In-patient pharmacy department of Narayana Multispecialty Hospital is a division of material department. Location- Ground Floor, Narayana Multispecialty Hospital The department runs 24* 7*365 days. The department strives to provide the best of medications as prescribed by the doctors and faster services to the patient.

Human resource:-

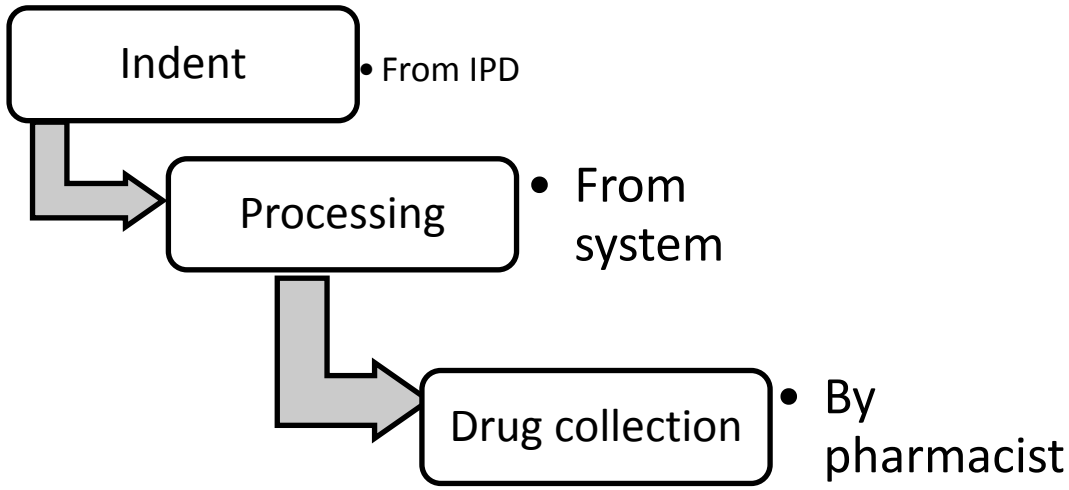
- 9 Pharmacists.
- 1 Helper.
- 5 Runner
- Shift timings:-Pharmacists
    - 8am-4pm (morning) - 1.
    - 10am-6pm (general)-2.
    - 12pm-8pm (evening)-3.
    - 8pm-8am (night)-2.

Activities:-

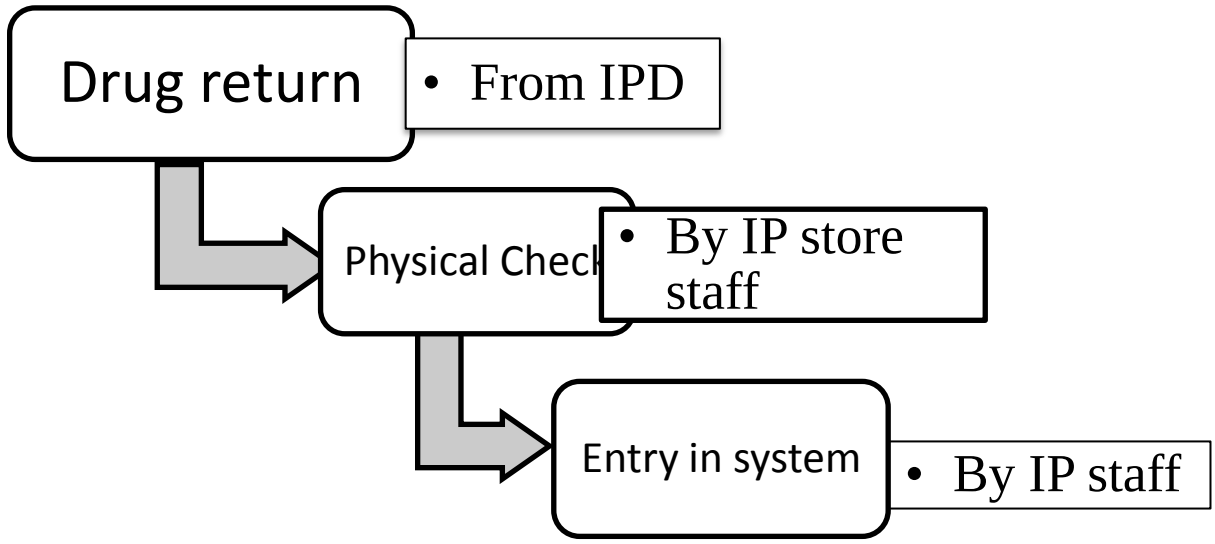
- **Receiving consumables from main store.**



- **Drug dispensing to IPD.**



- **Tasks: - Drug return and discharge.**



1st Project

A study to Categorize and manage Inventory in Narayana Multispecialty hospital, Jaipur

Introduction:-

About one-third of the annual hospital budget is spent on buying materials and supplies, including medicines. [1] The pharmacy is one of the most extensively used therapeutic facilities of the hospital and one of the few areas where a large amount of money is spent on purchases on a recurring basis. This emphasizes the need for planning, designing and organizing the pharmacy in a manner that results in efficient clinical and administrative services. [2] The goal of the hospital supply system is to ensure that there is adequate stock of the required items so that an uninterrupted supply of all essential items is maintained.

ABC analysis is a method of classifying items or activities according to their relative importance. It is also known as "separating the vital few from the trivial many" because, for any group of things that contribute to a common effect, a relatively few contributors account for a majority of the effects. The analysis classifies the items into three categories: the first 10-15% of the items account for approximately 70% of cumulative value (cost) (category A), 20-25% are category B items that account for a further 20% of the cumulative value and the remaining 65-70% are category C items, amounting for a mere 10% of the total value.[3]

VED analysis is based on critical values of the item. Based on their criticality, the items could be classified into three categories: vital, essential and desirable. There could be serious functional dislocation of patient care services in hospital when vital drugs are not available even for a short period. If essential items are not available beyond a few days, the functioning of the hospital can be adversely affected. The shortage of desirable items would not adversely affect patient care or hospital functioning even if shortage is prolonged. [3]

A combination of ABC and VED analysis (ABC-VED matrix) can be gainfully employed to evolve a meaningful control over the material supplies. Category I includes all vital and expensive items (AV, BV, CV, AE, AD). Category II includes the remaining items of the E and B groups (BE, CE, BD). Category III includes the desirable and cheaper group of items (CD). [4]

Topic: - A study to identify and resolve Inventory management issues in Narayna Multispecialty hospital, Jaipur.

Problem Statement:-

Organizations are more concerned with stock control because a lot of funds are invested in stock and stock forms are an important and major item of a firm's investment, despite the fact that most organizations carry out inventory control through stock taking, surprise checks and

other methods, there is always a variance between the actual result and the records kept by these organizations, thus exposing them to stock related costs that affect performance and service delivery.

Research Question:-

- What is the adequate inventory level?
- How adequate inventory level can be maintained?

Aim:

- To ensure the controlled & accurate inventory and to improve operational efficiency in supply chain management.

Objectives:-

- To analyse the stock movements in stores.
- To analyse the consumption trend for determining the rank of items on the basis of their consumption.
- To identify Demand forecasting according to item category.

Literature Review:-

The word "inventory" has been defined in many ways, as indicated in the literature. According to Chase, Jacobs and Aquilano (2004), inventory is the stock of any item or resource used in an organization. An inventory system is the set of policies and controls that monitor levels of inventory and determine what levels should be maintained, when stock should be replenished, and how large orders should be.

Inventory management involves providing the required inventory levels that will sustain the organization's daily operations at minimum costs. This covers issues like determining the level of stock to order, when to order, establishing receipt and inspection procedures and providing proper storage facilities. Without proper stock control procedures in place, firms are likely to face two undesirable inventory levels. This is to say excessive/ high levels of inventory or inadequate/ low levels of inventory.

For efficiently running of any organization in today's competitive environment proper implementation of inventory control is necessary to survive.

Good inventory policy would therefore mean:-

1) Never to shortage of any item.

2) Never to build-up a very huge inventory.
3) Never to order materials in small quantity many times.

Research methodology:

- **Research Design:**

Research approach adopted in the study is descriptive on the basis of analysis of DATA. The location of study is Materials department in Narayana multispecialty Hospital, Jaipur. Study is done in between 20th march, 2015 to 15th April, 2015.study covered All medical consumables consumed in study period.

- **Data Collection:**

Primary data is collected through system, and Secondary data through Records. For the purpose of DATA collection I have designed Observation Checklist (attached in annexure). DATA is collected from HINAI. Data is collected from 15th March, 2015 to 15th April, 2015, which includes 1665 items.

ABC Analysis (always better control)

- Also known as selective inventory control
- Provides mechanism for:
  - ✓ Identifying items that will have significant impact on overall inventory cost
  - ✓ Identifying different categories of stock that will require different management and controls.

Total Number of Medico-Consumables	A CATEGORY	B CATEGORY	C CATEGORY
1665	122	218	1325
	70%	20%	10%
Type of Control	Strict control	Moderate control	Simple control

Table-1 ABC analysis of medical consumable

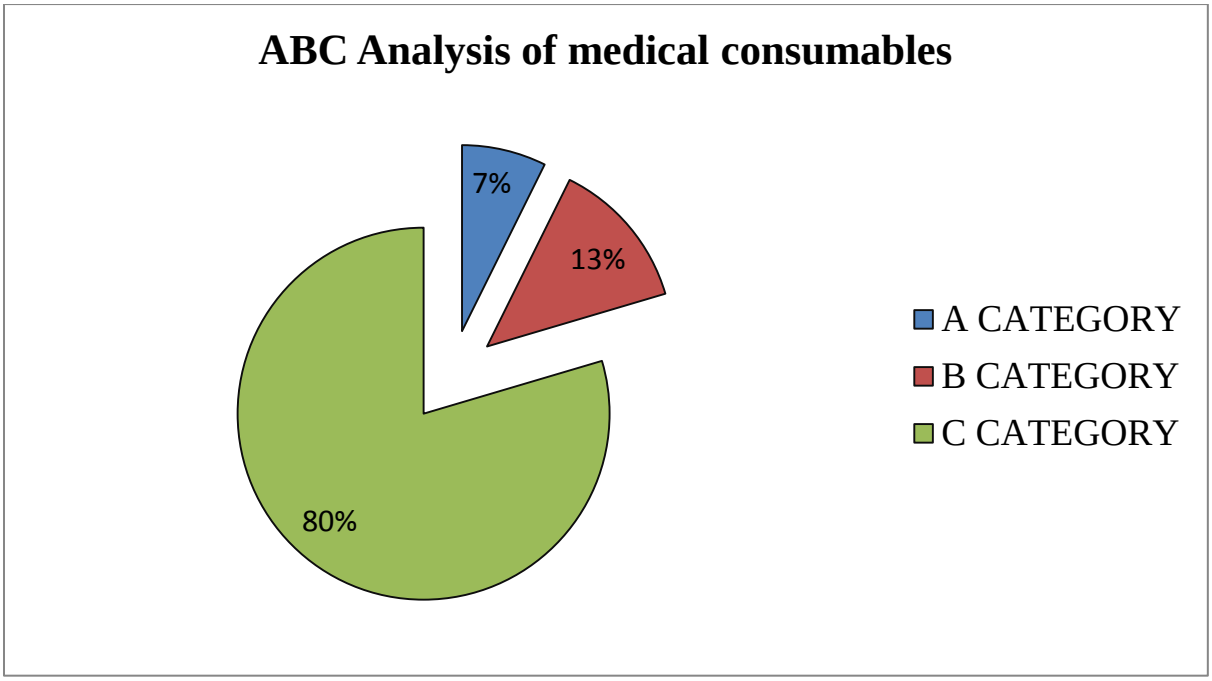


Figure-1 ABC Analysis of medical consumables

Above pie chart indicates that 7% of total medical consumables accounts for 70% of total cost, while 13% medical consumable accounts for 20% of cost, and rest of the items accounts for only 10% of cost.

VED Analysis

Based on criticality of the items:-

- VITAL- Items without which hospital can't perform its function. Higher level of control required.
- ESSENTIAL -Without which hospital can function for a short period. Middle level of control required.
- DESIRABLE -Without which hospital can function for a long period. Lower level of control

Total Medical Consumables	V category	E category	D Category
1665	375	1149	141
	22.62 %	68.93%	8.46%

Table-2 VED analysis of medical consumables

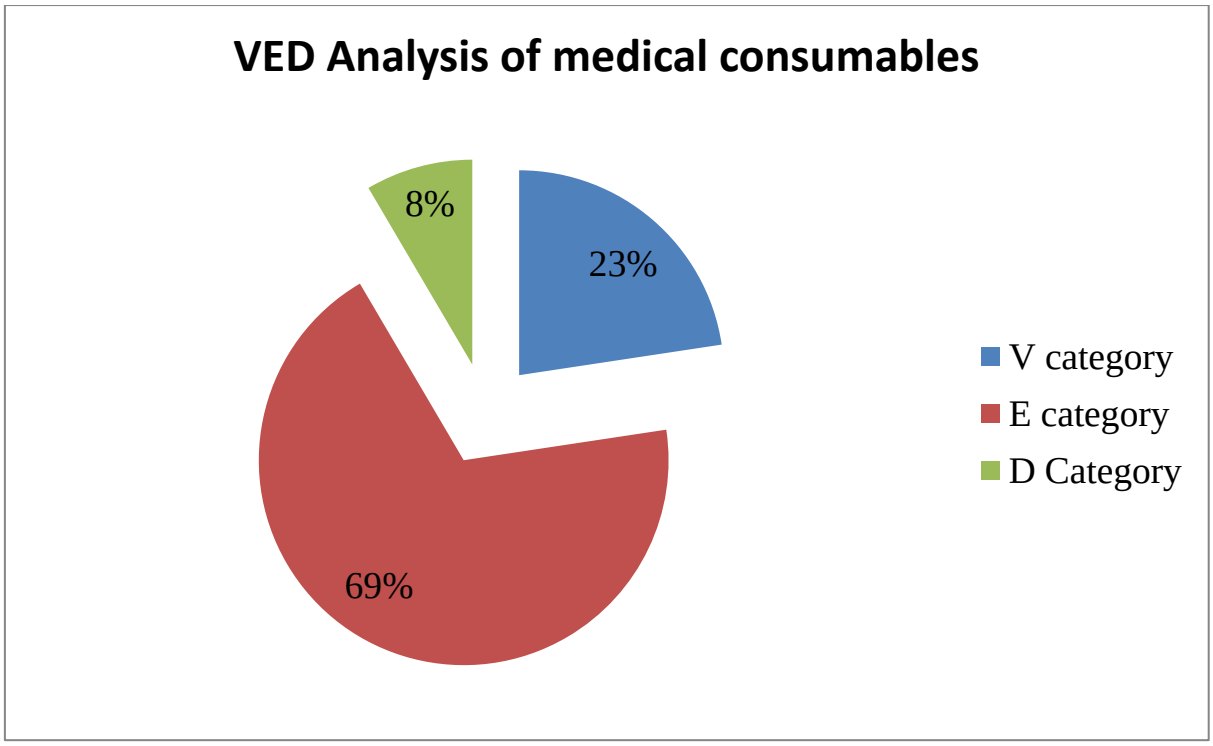


Figure-2 VED Analysis of medical consumables

Above pie chart indicates that 23% of total medical consumables are vital to hospital functioning and to save patients life, while 69% medical consumable are essential to hospital functioning that indicates stock out of these items for one can't hamper hospital functioning

and won't put patient's life at risk, and rest of the items are desirables and hospital can function smoothly for 3-4 days without them.

ABC-VED cross matrix

ABC / VED	"A" category	"B" Category	"C" Category	Total
"V" Category	19 (1.14%)	40 (2.4%)	316 (18.98%)	375
"E" category	87 (5.23%)	162 (9.31%)	907 (54.47%)	1149
"D" category	16 (0.96%)	23 (1.38%)	102 (6.1%)	141
Total	122	218	1325	1665

Table-3 ABC-VED Cross matrix

Above table indicates that only 1.2 % item belongs to A-V category and class-1(A-V, B-V, A-E) category accounts for 8.73% of total medical consumables. While class-2 (C-V, B-E, A-D) category accounts for 29.31% of total medical consumables. Rest of the items belongs to class-3.

Suggestions & recommendation

- For class-1items, orders should be placed frequently and lead time should be as less as possible, to keep inventory level low and prevent stock out.
- For class-2 items, 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.

2nd Project

A Study on Turnaround Time of drug dispensing and stock out in IP Pharmacy at Narayana Multispecialty Hospital, Jaipur.

Introduction:-

The major expectation from the pharmacy department in the hospital is to make right drug available at the right time. If drugs prescribed by internal consultants are not available in hospital pharmacy it affects hospital's image and leads to patient dis-satisfaction. In each hospital there is provision of drug formulary and procedure to add drugs in that formulary. But if drugs which are listed in formulary and not present in pharmacy it affects consultants also because they need to change prescription ordered.

The delays in delivering of drugs and medical consumables interrupt in the smooth functioning of pharmacy. Monitoring medication turnaround time in inpatient settings allows organizations to measure the impact of their quality on the increased efficiency of patient care. A potential benefit of health application software's in inpatient setting is decreased medication turnaround time (5).

Turnaround time (TAT) is the total time taken between the submission of a process/task for execution and the return of the complete output to the customer/user. TAT is one of the metrics used to evaluate operating system scheduling algorithms (6). Medication turn-around time is a time-to-first-dose, or medication turn-around time, is considered the interval from the time a medication order was composed to the time the medication was delivered. Moreover, time-to-first dose can be broken down into two key phases: the time from when the order was composed to the time that pharmacy verifies the order, and the time from pharmacy verification to the time the medication was delivered (7).

Hospitalized patients may experience delays in care due to delays in medication administration. Delays can be disastrous, the effects can be horrifying in terms of mortality and morbidity, and that is why continuous monitoring of the procedure and continuous efforts, dedication of whole staff and co-ordination between the staff members is required for smooth running of the process of pharmacy to vitalize the lifelines of hospital that is "Medicines". For example, delays in therapeutic or prophylactic administration of antibiotics can have a major effect on patient outcomes.

Improves medication turnaround time could help providers to better adhere to evidence-based guidelines in case where medication administration is recommended for a given time in the patient's care.

Topic: - "A Study on Turnaround Time of drug dispensing and stock out in IP Pharmacy at Narayana Multispecialty Hospital, Jaipur".

Problem Statement:

The major expectation from the pharmacy department in the hospital is to make right drug available at the right time. The delays or inability in delivering of drugs and medical consumables interrupt in the smooth functioning of pharmacy (1).If drugs prescribed by internal consultants are not available in hospital's IP pharmacy it affects functioning of the department, hospital's image, leads to delay in drug dispensing and patient dis-satisfaction.

Research Questions

1. What are the steps of drug dispensing process?
2. What is the average duration of drug dispensing?
3. What is the exact percentage of stock out?
4. What are the reasons behind delay in drug dispensing and stock out?
5. How to optimize functioning of IP pharmacy?

Aim:

To analyse and reduce the turnaround time (TAT) of drug dispensing and stock outs.

Objectives:

- General :-
  - ✓ To trace the delays in the order and delivery system of In-patient pharmacy and check the average total time consumed in delivering drugs and medical consumables to the patients.
- Specific :-
  - ✓ To find out the reasons of high TAT in drug dispensing and stock outs.
  - ✓ To understands the bottlenecks.
  - ✓ To reduce high TAT and stock outs.

Literature Review:-

Medication turnaround time is defined as the interval from the time a medication order is written (manually or electronically) to the time the medication was administered.

Stock out is defined as non-availability of medicine in hospital pharmacy in a given period.

Study, “Les erreurs medicament uses ou l'épée de Damoclés”,Pharmactuel done by F. Boulet, states that an appropriate management of medicines must ensure patient safety in accordance with the five "R": the right product or the right service to the right patient at the right time using the right way and in the right quantity If medical supplies are out-of stock, distributed to the wrong patient or are prepared inadequately, patients may experience adverse events, and in some cases death .

A study on “Medication Turnaround Time (TAT) in Hospital Pharmacy Department” was carried out by Vijay Pratap Raghuvanshi1, Himanshi Choudhary. The results of the study revealed that all types of indents were delayed; especially urgent indents also got delayed, which became the major area of concern.

Research methodology:

- **Research Design:**

Research approach adopted in the study is descriptive on the basis of analysis of DATA. The location of study is Materials department in Narayana multispecialty Hospital, Jaipur. Study is done in between 8th march, 2015 to 8th April; 2015.study covered all medical consumables consumed in study period and indents from all the departments of hospital.

- **Data Collection:**

Primary data is collected through system, and Secondary data through Records. For the purpose of DATA collection I have designed Observation Checklist (attached in annexure). DATA is collected from HINAI. Data is collected from 8th March, 2015 to 8th April, 2015, which includes 1665 items 300 indents and 1960 rejected items.

Data analysis:-

Drug dispensing TAT

Ideal drug dispending time is within 1 hour for critical areas like MICU, CCU and ITU, and within 2 hour for non- critical areas. But it is observed during project it is 2 hour 30 min

average for all the areas and same for both areas, which indicates there is no provision for separation of indents according to need of patients.

Drug dispensing process includes four processes, i.e. indent by in patient department, processing by system in IP Pharmacy store, and picking up of drugs manually according to processed indents and distribution to respective department by runners.

Break-up of TAT is processing time, i.e. time between indenting and processing from system which was 57 min(average), and collection time, i.e. time taken by pharmacy staff to collect consumables which was 1 hour 5min, and distribution time, i.e. time taken by runners to distribute drugs to respective departments which was 15 min.

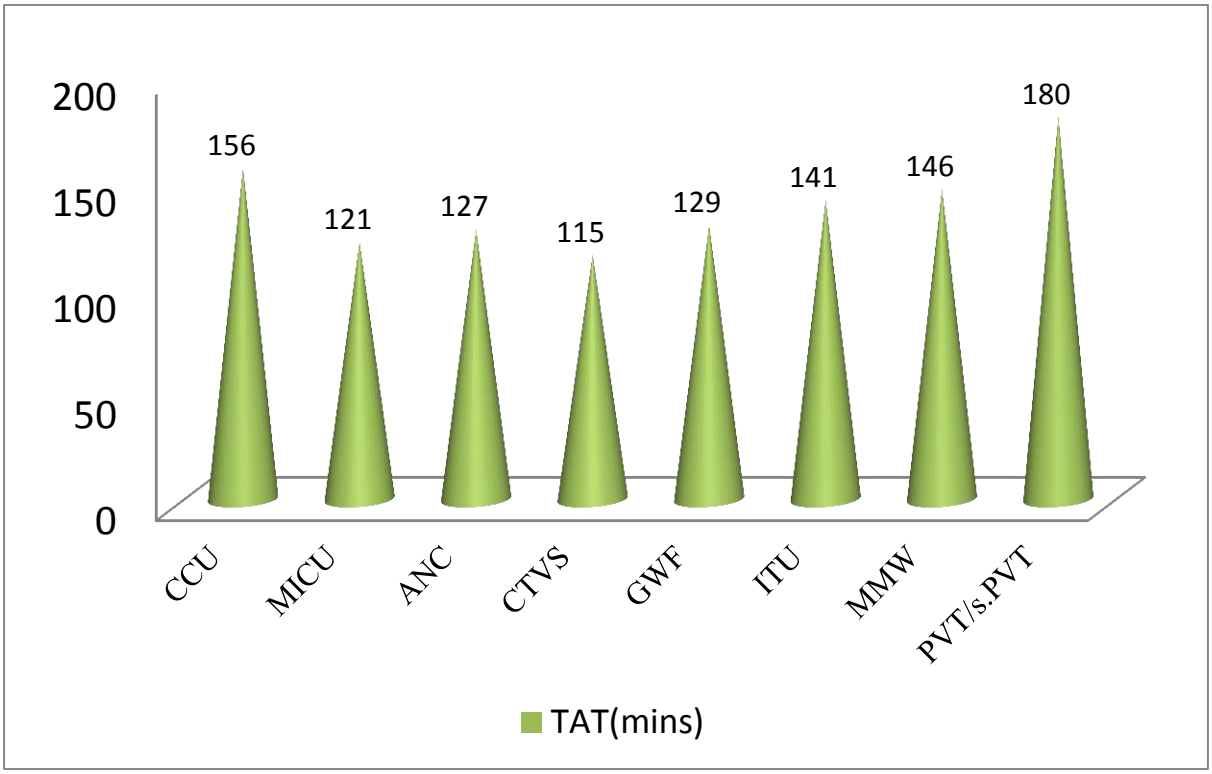


Figure-3 department wise TAT of drug dispensing

Above graph depicts drug dispensing TAT for different departments, which was highest 3 hour for private ward and lowest 1hour 55min for CTVS ward.

Drug reject

In data collection period 31126 items were indented for patient use from all the wards of hospital. Out of which frequency of rejection was 1960 which accounts for 6.3% of total indented items. In rejection 720 items were rejected. Frequency of stock out was 955 (3.1%) and 410 item were out of stock at the time of indent, While 565 items were rejected due to wrong coding.

Comparison of rejection week wise				
Detail	Week-1st	Week-2nd	Week-3rd	Week-4th
Total indented items	6400	7618	5784	6996
Frequency of rejection	385 (6%)	400(5.25%)	420(7.26%)	519(7.41%)
Items rejected	217	207	151	237
Stock out frequency	112(1.8%)	152(2%)	152(2.62%)	317(4.53%)
Items out of stock	50	92	91	145
Wrong code	164(2.56%)	158(2.07%)	85(1.47%)	93(1.33%)

Table-4 week wise Comparison of rejection

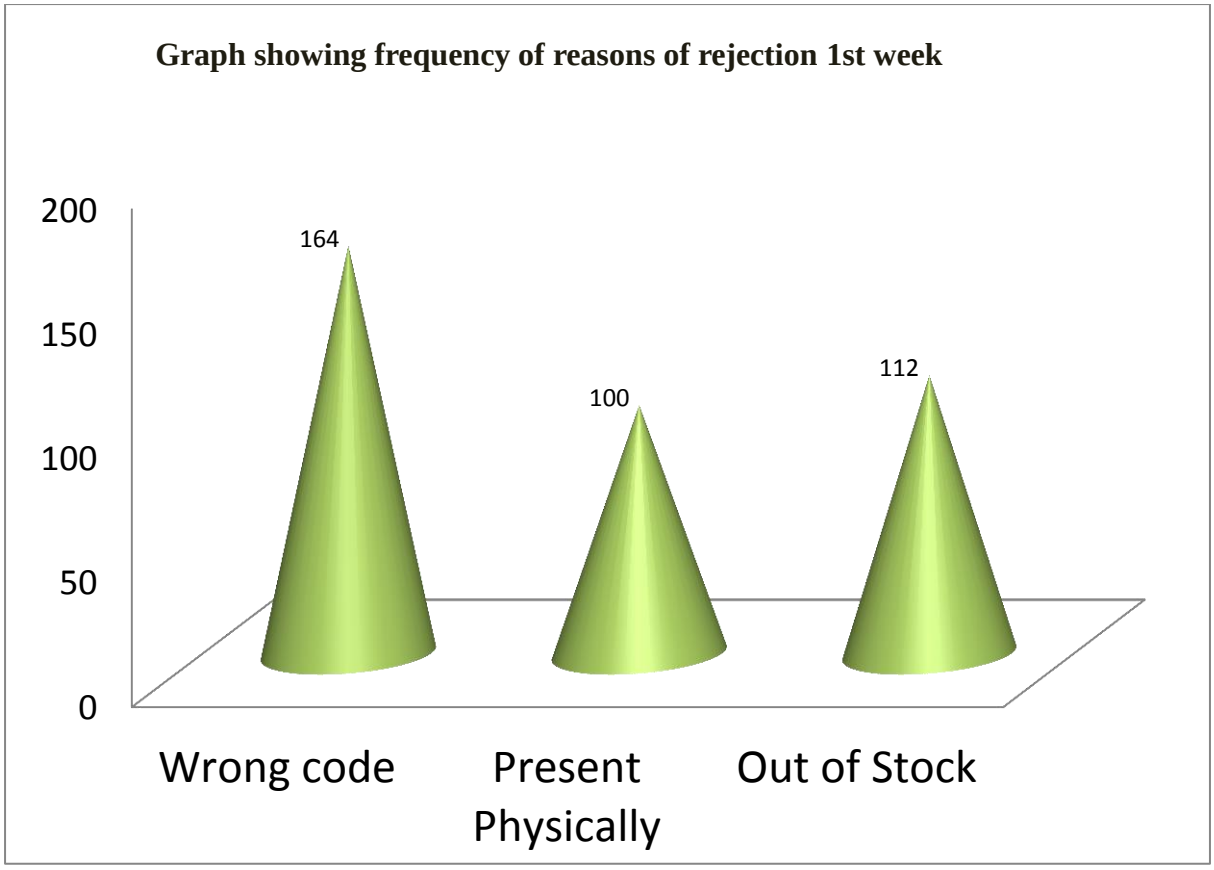


Figure-4 frequency of reasons of rejection 1st week

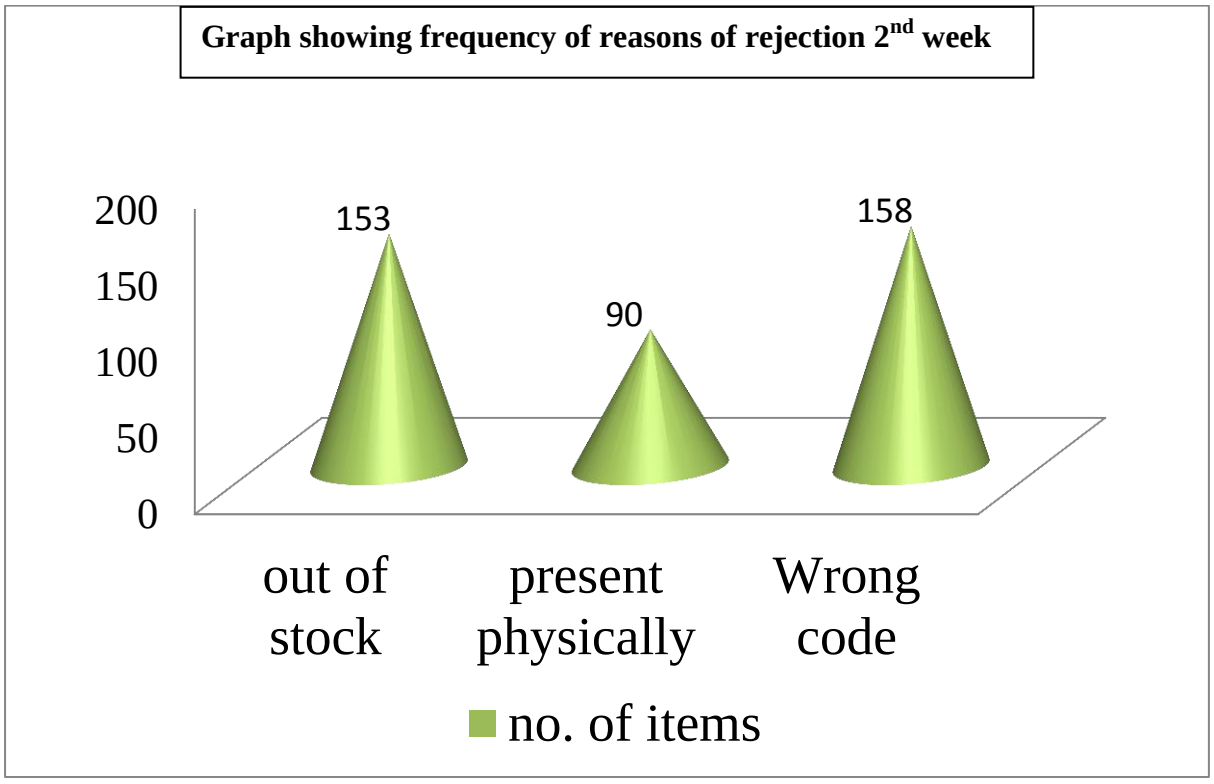


Figure-5 frequency of reasons of rejection 2nd week

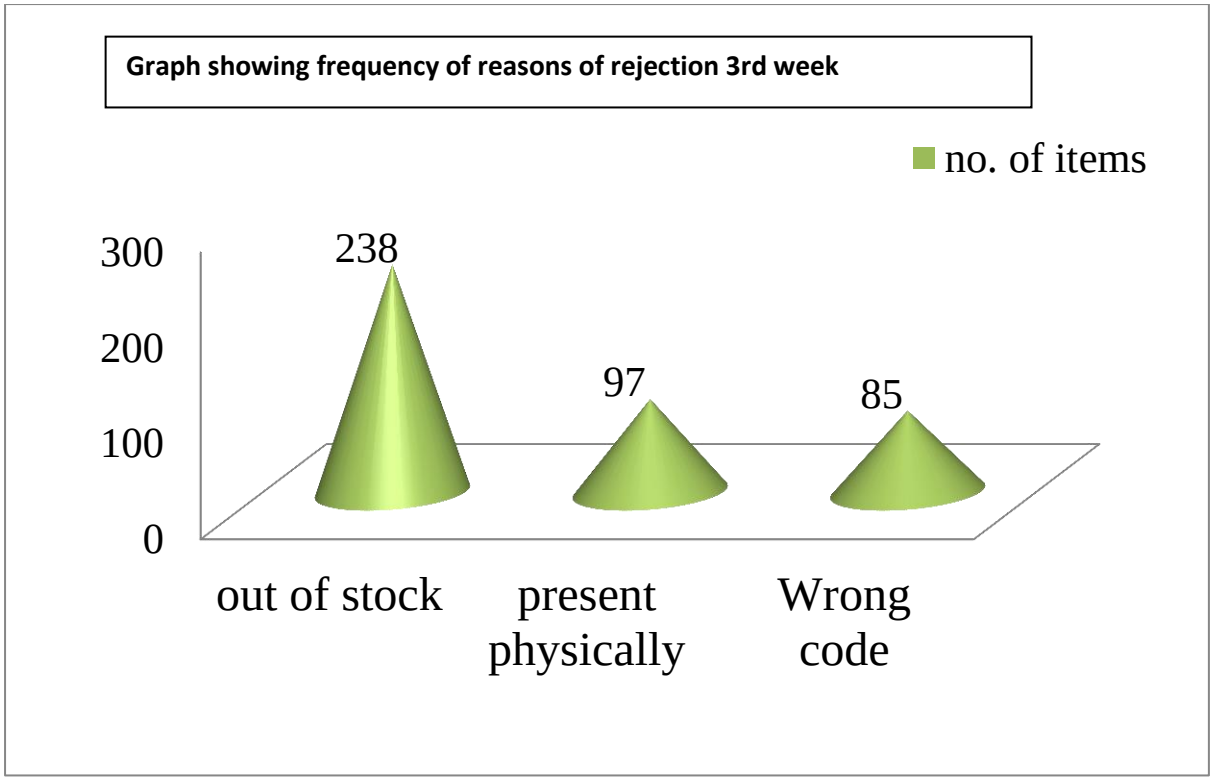


Figure-6 frequency of reasons of rejection 3rd week

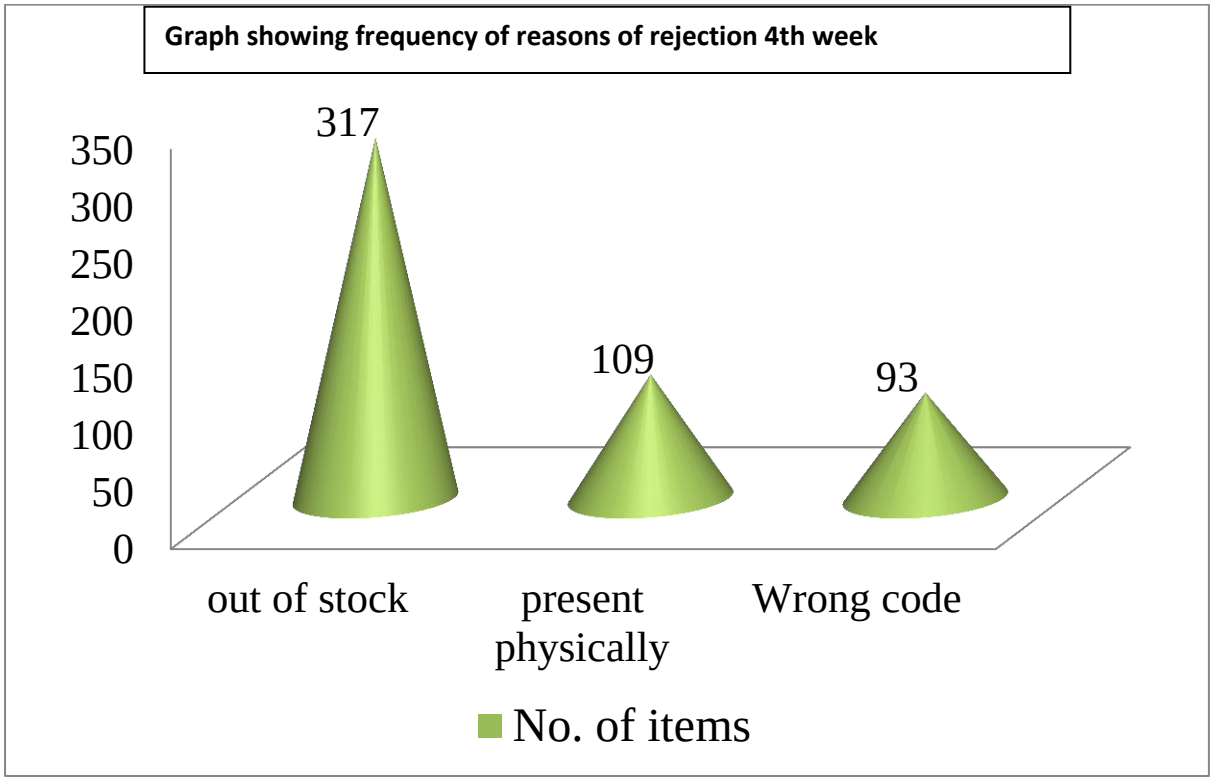


Figure-7 frequency of reasons of rejection 4th week

Above graph shows that frequency of out of stock items are maximum in the last week whole it minimum in the first week which gradually increasing likewise wrong codes are decreasing in opposite pattern.

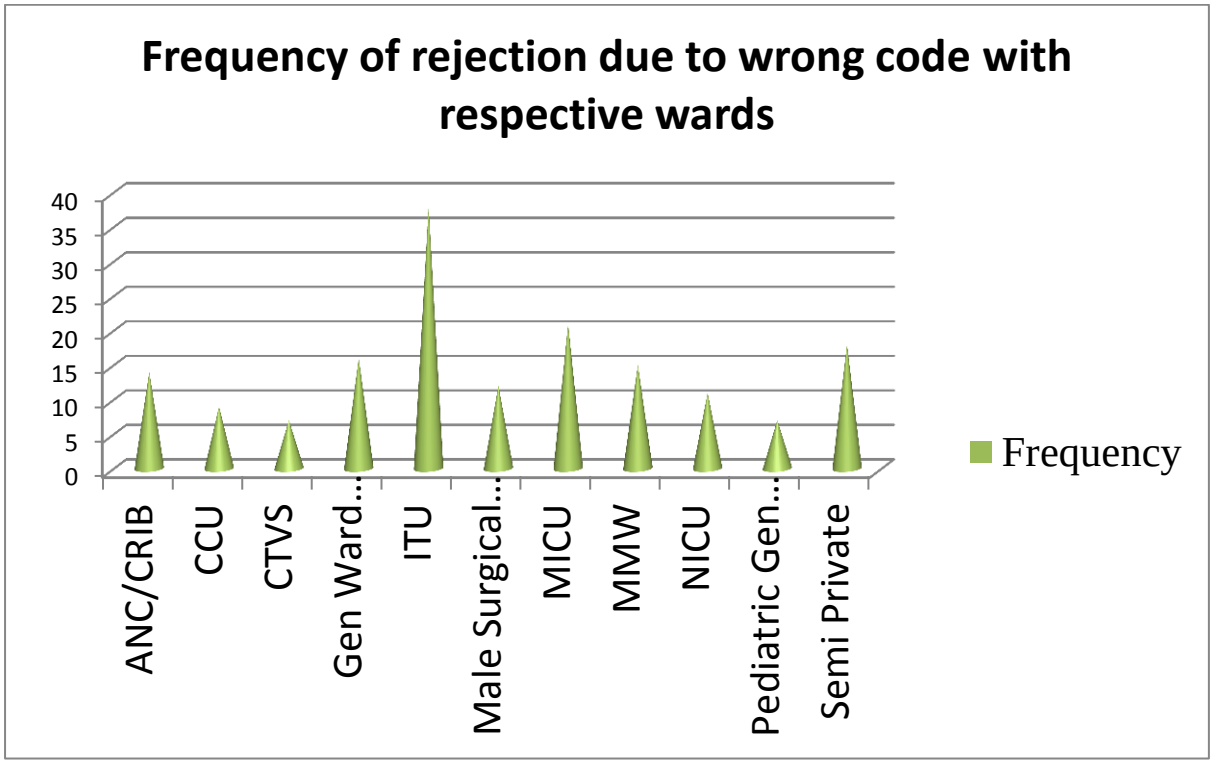


Figure-8 Frequency of rejection due to wrong code with respective wards 1st week

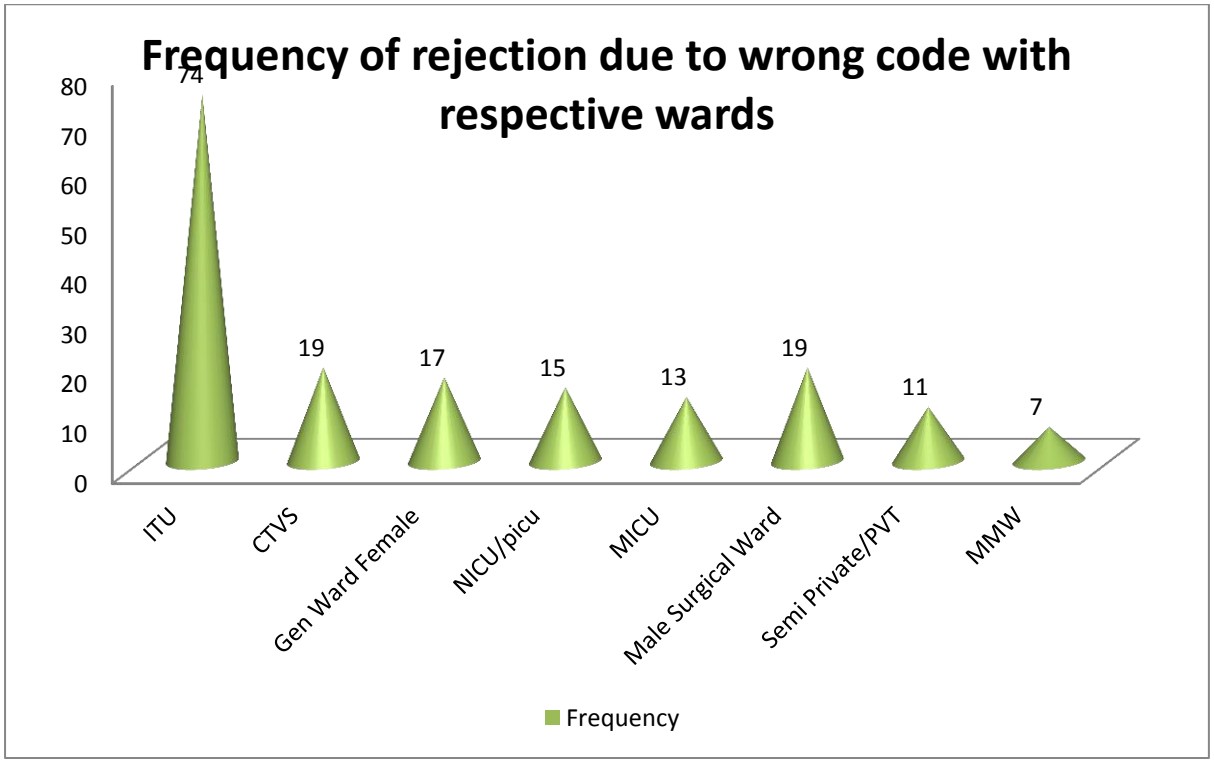


Figure-8 Frequency of rejection due to wrong code with respective wards 2nd week

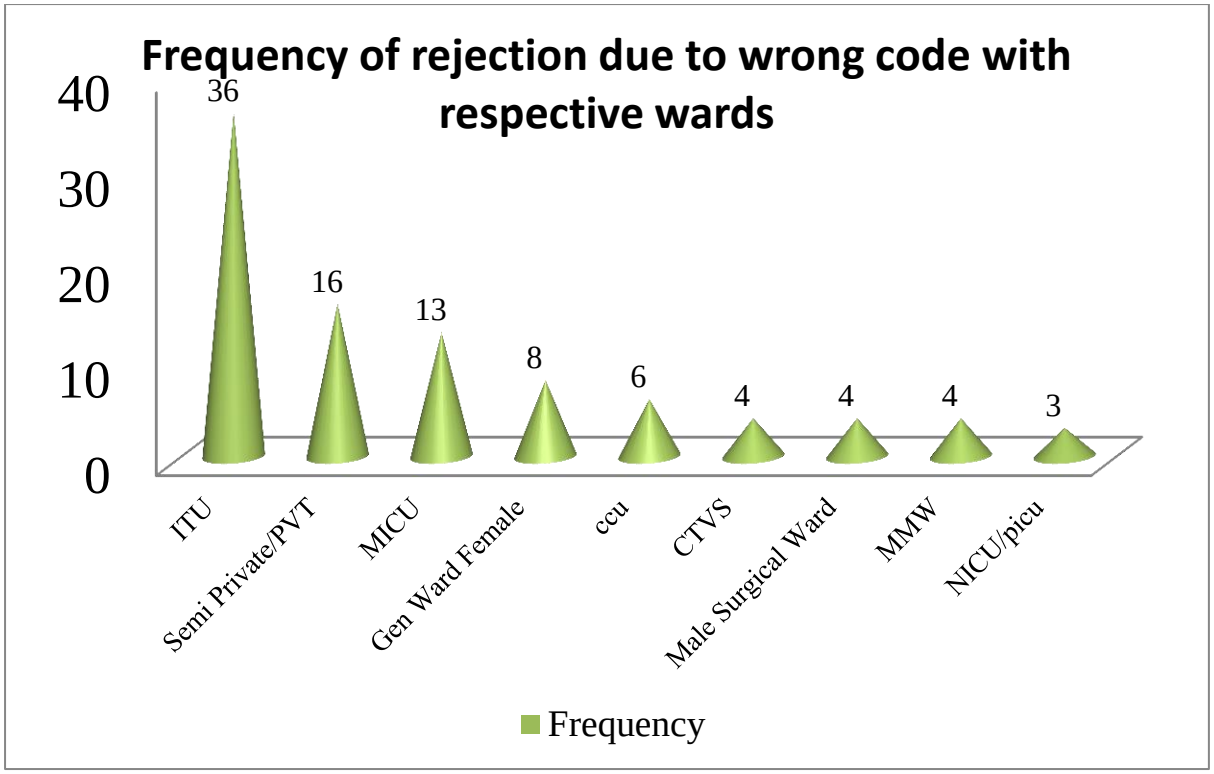


Figure-8 Frequency of rejection due to wrong code with respective wards 3rd week

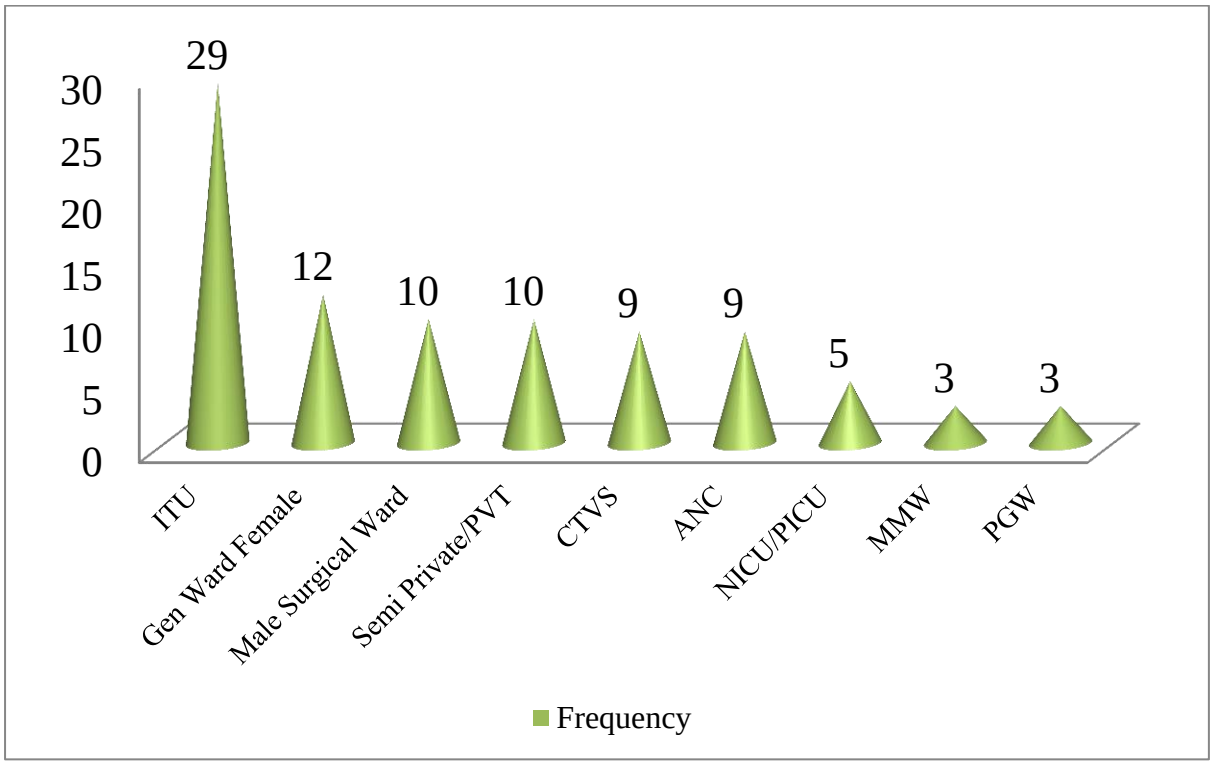


Figure-8 Frequency of rejection due to wrong code with respective wards 4th week

Above graphs depicts that most of the wrong codes are indented from ITU.

Actions taken for out of stock drugs 1st week

- Requisition Sent:-21(Purchased next day)
- Purchased From OPD:-7
- Cash Purchase:-17
- Substitute Provided:-32
- Purchased-27
- Short Supply:-5
- Pending Order:-9

Actions taken for out of stock drugs 2nd week

- Requisition Sent:-59
- Purchased From OPD:-30
- Substitute Provided:-34
- Purchased-25
- Short Supply:-2
- Pending Order:-3
- Present in main store:-13
- Present in OT store:-19

Actions taken for out of stock drugs 3rd week

- Requisition Sent:-126
- Purchased From OPD:-80
- Substitute Provided:-21
- Purchased-41
- Short Supply:-2

- Pending Order:-11
- Present in main store:-6
- Present in OT store:-21

Actions taken for out of stock drugs 4th week

- Requisition Sent:-161
- Purchased From OPD:-80
- Substitute Provided:-14
- Stopped-8
- Purchased-60
- Pending Order:-3
- Present in main store:-26
- Present in OT store:-33

Drugs purchase duration:-

For the drugs which are not pr4esent in OPD department directly contact vendors for drug purchase without Purchase order and buy on challan. Following duration shows time taken by vendor to make those drugs available to the patient:-

- Purchased same day:-107
- Purchased in 24 hours:-57
- Purchased in between 24-48hours:-25
- Purchased in between 48-72 hours:-15
- Purchased after 72 hours:-11

Drugs purchased after 72 hours:-

- Acostin 1m IU
- Bed under pads.
- BT set
- Diapers baby Medium.
- Envas-2.5mg
- Ibugesic plus syrup-100ml
- Lactihep syrup
- Measures volume set
- Paediatric nebulizer mask
- Rantac syrup
- Surgical blade no-11
- Voveran-50mg

Recommendations and suggestions:-

- Indents should be separated according to indented department and indets from critical areas should be processed on priority basis.
- There should be provision of different slots of time for indents for different department.
- Stock out can be minimized by proper demand forecasting and by reducing lead time, and categorizing inventory according to item movement (FSN analysis) or criticality of use (VED).

REFERENCES

1. Kant S, Pandaw CS, Nath LM. A management technique for effective management of medical store in hospitals. Medical store management technique. J Acad Hosp Adm. 1996 and 1997;8 and 9:41–7. [PubMed]
2. Kunders GD, Gopinath S, Katakam A. In: Hospitals: Planning, Design and Management. New Delhi: Tata McGraw-Hill Publishing Company Limited; 2000. Planning and designing supportive services-Pharmacy; pp. 273–81.
3. Kidwai M. A report of inter-country course. New Delhi: National Institute of Health and Family Welfare; 1992. Inaugural address. Logistics and supply management for health and family planning programme; pp. 66–70.
4. Pillans PI, Conry I, Gie BE. Drug cost containment at a large teaching hospital. Pharmacoeconomics. 1992; 1:377–82. [PubMed]
5. Gupta S, Kant S. In: Hospital stores management - An integral approach. New Delhi: Jaypee Brothers Medical Publishers(P) Ltd; 2000. Inventory control; pp. 60–72.
6. Ramanathan R. ABC inventory classification with multiple-criteria using weighted linear optimization. Comput Oper Res. 2006;33:695–700.
7. Das JK. Inventory Control. In: Kaushik M, Agarwal AK, Arora SB, editors. Essentials of Logistics and Equipment Managemnt, Manual of Post Graduate Diploma in Hospital and Health Management. New Delhi: Indira Gandhi National Open University, School of Health Sciences; 2001.
8. Gandhi P, Basur A. Application of ABC analysis in medical store of ESIC, Delhi. Health Administrator. 2000; 9and10:90–5.
9. Vaz FS, Ferreira AM, Kulkarni MS, Motghare DD, Pereira-Antao I. A Study of Drug Expenditure at a Tertiary Care Hospital: An ABC-VED Analysis. J Health Manag. 2008; 10:119–27.