Study on Assessing the Effectiveness of Inventory Management in a Tertiary Cure Hospital

By

Sana Sood

Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management

Academic year, 2014-2016

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(WHO Collaborating Centre for District Health System Based on Primary Health Care)

IIHMR UNIVERSITY

TO WHOMSOEVER MAY CONCERN

This is to certify that Sana Sood student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training at Global Hospitals Hyderabad , from 8th Feb 2016 to 7th May2016.

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

The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.

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The IIHMR University, Jaipur

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The certificate is awarded to

Sana Sood

In recognition of having successfully completed her internship in the department of

Supply Chain

and has successfully completed her Project on

Inventory Management

Date 7th May 2016

Global Hospitals , Lakdikapul, Hyderabad

She comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish her all the best for future endeavors

Ms Garima Gupta
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CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled A Study on assessing the effectiveness of Inventory Management in a tertiary care hospital, Global Hospitals, Hyderabad and submitted by Sana Sood Enrollment No. 0208 under the supervision of Professor Dr. Neetu Purohit IIHMR University for award of MBA Health and Hospital Management of the University carried out during the period from 8th Feb 2016. to 7th May 2016 . 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.

Sana Sood
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ACKNOWLEGEMENT

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At the end, I am thankful to God and my heartfelt gratitude to my parents and friends who supported me throughout the course.

THANK YOU ALL

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Global Hospitals

About the Hospital

Global Hospitals Group, India's most renowned healthcare services provider offering better care, cutting-edge research and advanced education to caregivers, is one of the country's fast growing chains of Multi Super Specialty Tertiary Care Hospitals offering healthcare services of international standards. A 2000-bed Multi Super Specialty Tertiary Care facility spread across Hyderabad, Chennai, Bangalore and Mumbai, Global Hospitals is a pioneer in Multi-Organ Transplants including kidneys, liver, heart and lung.

The Group offers most advanced clinical services across several disciplines such as Gastroenterology, Hepatobiliary & Liver, Cardiac Sciences, Neurosciences, Orthopaedics & Joint Replacements, Organ Specific Cancer Care, Urology & Nephrology, Plastic & Reconstructive Surgery, Minimal Access & Bariatric Surgery, Critical Care & Pulmonology, Trauma & Emergency Care, ENT, Transfusion Medicine and other support specialties accessible to all the segments of the society with utmost care and compassion.

With a vision to be a world-class healthcare provider turning distant possibilities into realities, Global Hospitals utilizes a strong combination of clinical expertise, advanced technology, world-class infrastructure and facilities is to deliver high quality medical services of international standards. Having collaborations with several leading Indian and internationally reputed academic institutions, the Group offers a wide array of academic programmes for both medical and non-medical professionals. Recognized by the government bodies for research, the Group has made significant strides in advanced medical research programmes including Stem Cell and Regenerative Medicine Programmes.

WHEN WAS IT STARTED?

Founded in 1999 at Hyderabad (India) with 150-bed tertiary care hospital, Global Hospitals Group is acclaimed nationally and internationally for its excellence in clinical care. After establishing a second 300-bed hospital in 2002 at Hyderabad, the Group went on to establish a chain of super specialty hospitals across other major cities in India.

To meet the changing needs of the community and provide comprehensive range of healthcare services to all the sections of the society, the Group made remarkable growth and expansions over the past few years. This

culminated into opening of Global Health City, a 27-acre Multi Super Specialty 500-bed quaternary care facility in Chennai, built according to the International Standards and quality benchmarks. In addition, the Group went on to established Global Hospitals, Bengaluru, a 500-bed state-of-the-art multi-disciplinary tertiary care hospital with world-class facilities, and Global Hospitals, Mumbai, a 450-bed multi-super specialty and multi-organ transplant facility at the financial capital of India. These facilities are an expression of Global Hospitals Group's fundamental mission of service excellence.

With latest technology, integrated research processes, multi-disciplinary capability, best clinical practices and education, state-of-the-art facilities, world-class infrastructure and excellent patient care, Global Hospitals has now become the most advanced and progressive healthcare leader in India.

As part of its Corporate Social Responsibility, Global Hospitals works in collaboration with local partners to regularly assess and address the healthcare needs of the communities it serves, producing marked improvements in their health.
Global Hospitals Group is committed to providing world class tertiary healthcare to people in India and abroad by fusing the benefits of modern technology with the clinical acumen of the leading specialists in their respective fields.

MISSION
The Mission of Global Hospitals Group is to achieve the dream of a healthy world through continuous innovation, dedication to quality, provision of compassionate and affordable medical services.

To carry out this mission Global Hospitals strongly believes in

- Deploying state-of-the art facilities and equipment
- Attracting the most talented medical, scientific and support staff
- Providing affordable health care of unsurpassed quality
- Exceeding service expectations
- Adhering to professional and scientific integrity
- Embracing change and encouraging innovation

VISION
To be a world-class medical services provider turning distant possibilities into today's realities.

Located strategically across major cities in India, Global Hospitals Group offer a unique environment where friendly attitude and personal touch of a neighborhood hospital merge with leading-edge technologies, extensive research resources and tremendous opportunities of a prestigious healthcare network. The result is a dynamic and rewarding setting delivering better clinical outcomes for patients by doctors, nursing and allied health professionals.

The Group's commitment to create a positive experience for all the patients who walks through its doors influences every facet of care, and applies across all levels of the organization. As a result, Global Hospitals are known as national players in healthcare delivery providing the highest level of patient satisfaction.

The Group, led by a highly renowned team of specialists and visionaries, was named as India's most admired, promising healthcare provider and hospitals chain by Frost & Sullivan, a leading business consulting firm that offers market analysis, market research, and reports.

With a proud tradition of medical excellence, as evidenced by many of its 'firsts' and medical breakthroughs, Global Hospitals strives to provide quality healthcare, where the most advanced treatments are delivered by the region's leading medical professionals. Some of the 'firsts' by the Group include:

- First Pediatric Auxiliary Liver Transplant in Asia
- First Hospital in South Asia to perform Pediatric Auxiliary Liver Transplant
- First Hospital in South Asia to perform the Nucleus Replacement in Spine
- First Successful Split & Auxiliary Liver Transplant Surgery in India
- First Successful Combined Heart & Kidney Transplant Surgery
- First successful Single Lung Transplant in India
- First Successful Minimal Access Lung Transplant in India
- First Swap Liver Transplant on adults in India

Global Hospitals, Hyderabad, Lakdi-ka-pool

The Hyderabad - Lakdi-ka-pool location of Global Hospitals is where Global Hospital's journey began. The 200-bed facility offers multi-speciality, multi-organ transplantation services with world class infrastructure and top notch physicians & staff.

A:Front office:-

The front office of global hospitals is a hub of all the important activities happening in the hospital. There is a main entrance from where all the patients and attendants come in and a reception area where the patient registrations take place.

PATIENT REGISTRATION PROCESS:

- Patients enter the hospital, approach the reception and fill the "initial registration form" which are in two languages which is Telugu and English. They submit the form to the executives at the reception desk and they feed it in their computer system.
- They get a UHID number which is valid per person for lifetime.
- The person fills the name of the doctor or the diagnostic procedure according to which the doctors name is suggested to the patient in the initial assessment form
- The patient gets a OP Registration slip for which he pays the money at the billing counter and proceeds to the doctor accordingly.

  There are several OPD'S on ground floor, second floor and fifth floor respectively in the hospital with maximum public at the ground floor. Specific Secretaries are assigned to a bunch of doctors which have a duty of assigning appointments to the patients according to the availability of the doctors and guiding the patients about the different medications which are prescribed by the doctors.

MAJOR DEPARTMENTS AT GLOBAL HOSPITALS LAKDIKAPUL AND THEIR RESPECTIVE DOCTORS:

1) Department of Anaesthesiology:
2) Department of Bariatric Surgery: Dr Laxmi .K
3) Department of Cardiology: Dr Sai Sudhakar, DrPawan, Dr Das
4) Department of Cardiothoracic and Vascular Surgery: Dr Dharma Rakshak
5) Department of Emergency and Trauma: Dr Kamesh , Dr Anand Joshi
6) Department of ENT: Dr Nalinikant
7) Department of Gynae: Dr. Shanti, Dr Shashikala
8) Department of Interventional Radiology: Dr Shridhar
9) Department of Critical Care : Dr Kamesh and Team
10) Department of Dermatology: Dr Pranith
11) Department of Endocrinology: Dr Laxmi lavanaya
12) Department of General Medicine: Dr Kamesh and Team
13) Department of Heart Transplantation: Dr Rahul Chandola , Dr Tapaswini, Dr SaiSudhakar
14) Department of Liver , Pancreas Diseases and Transplant: Dr Vijay Kumar Bada, , Dr Balbir Singh , Dr Venu Gopal
15) Department of Nephrology and Kidney Transplant : Dr Sridhar, Dr Rama, Dr Malakondiaha
16) Department of Liver Transplant: Dr Venugopal, Dr Balbir Signh , Dr Manoj, Dr Dharmesh
17) Department of Lab Medicine: Dr Nagraj
18) Department of Medical Gastroenterology: Dr Kiran Peddi and team
19) Department of Oncology: Dr Ravi Kumar
20) Department of Multi Organ Transplant : Dr Sridhar
21) Department of Neurology : Dr Gopal Paudwal
22) Department of NeuroSurgery: Dr Pravin Ankiti
23) Department of Orthopedics and Joint Replacement: Dr Chandra Bhushan and Team
24) Department of Pulmonary Medicine: Dr Tapaswi Krishna
25) Department of Transfusion : Dr Surekha
26) Department of Urology: Dr Malakondiaha
27) Department of Hepatology: Dr Dharmesh Kapoor
28) Department of Plastic Surgery: Dr Jitendra

B. Labs at Global Hospital:

The Labs are located in the building which is opposite to the hospital building. Global Hospital Labs are accreditated by NABL. There are 5 main Departments in the Lab Building which are :

1) **Department of Clinical Biochemistry**: Headed by Dr Pradeep Naik
2) **Department of Hematology and Clinical Pathology**: Headed by Nagraj
3) **Department of Histopathology and Cytopathology** : Headed by Dr Mahendra
4) **Department of Microbiology and Serology**: Headed by Dr Ranganathan
5) **Department of Transplant Biology and Immunology**: Headed by Dr Laxmi Kiran
   All the procedures are done according to NABL standards with all the precautions and sterility is strictly maintained in the labs.

Process Flow

1) Blood is collected at the sample collection room in the cellar area of the hospital building according to UHID number for OP patients. Nurse takes the blood sample for IP patients and sends them through the runner boy.
2) The runner boy takes all the samples for processing in the Lab Building every 45 mins.
3) After processing of the samples the reports come within 4-5 hrs at the "Report Collection Counter " in the hospital Building.

- **Transport Department:**

Global Hospitals has 3 Ambulances with all important emergency equipments like defiblerator, , Portable Ventilator, Oxygen Pump, Critical Care Medicines, Oxygen Cylinders, Stretchers etc.

- **Security:**

Global hospitals has an outsourced security manpower available from Kanchella.

C. Radiology Department

Includes Digital X-Ray, CT Scan, Ultrasound and Fluoroscopy.

X-Ray

There are 2 X-ray fixed machines and 3 portable X-ray machines.

Manpower- 6 technicians

Each shift (2 technician)

TLD Badges- Thermo luminescence dosimeter

Issued to the staff who gets exposure to X-Rays.

Once in 3 months it goes to the lab for checking the exposure limit.

Liscensing- AERB liscense mandatory (valid upto 5 years)

X-Ray Cassettes- 3 sizes available:

- 17*14 inches
- 12*10 inches
- 10*8 inches

One cassette can have 1000 exposures

- Through PACS image is transferred into the system.

CT Scan

64 slices CT is being used by global hospital. Required temperature is 15-21degree C, Humidity 30-60%

Manpower – 4 Radiologist

4 technician (Bsc. MlT , DMIT)

Procedures- CT Angiogram

- Head and neck
- Pulmonary
- Abdominal
- Coronary
- Peripheral vascular

Routine CT scan

- CT brain ,PNS, Orbits, Neck
- CT chest & HRCT chest
- CT abdomen
- CT axial/ appendicular skeleton

3 D CT Face and Joint

Virtual Colonoscopy & Broncos copy

brain, CT abdomen ,CT chest with contrast , Trifusic liver

For both CT and X-Ray, lead screen and lead apron is used by the technicians for shielding.

Ultrasound

There are 2 Ultrasound machines in the in Radiology Department.

It works on the principle of peizo electric effect.

PNDT ACT 1994, rules 1996

Manpower- 3 nurses(shiftes)

8:00-4:30

9:00-5:30

12:00-8:30

PROCEDURES- liver biopsy

Renal biopsy

Pig tail insertion

Malecot insertion

PROBES- 3 types

- Convex- whole abdomen
- Linear- deeper areas
- TVS- trans vaginal scan

FLUROSCOPY- 800 MA

Types of procedure:

- Barium swallow(Given Orally)- oesophagus -1glass water diluated with barium given to patient.
- IVP barium- barium enema done through colon / rectum (barium not diluted with water).
- Barium follow-(orally)-done through stomach ,small intestine -2 glasses of barium given to the patient diluted with water

STAFFING:

1 HOD

4 Seniour consultant

6 Associates consultant

5 Technician

1 housekeeping

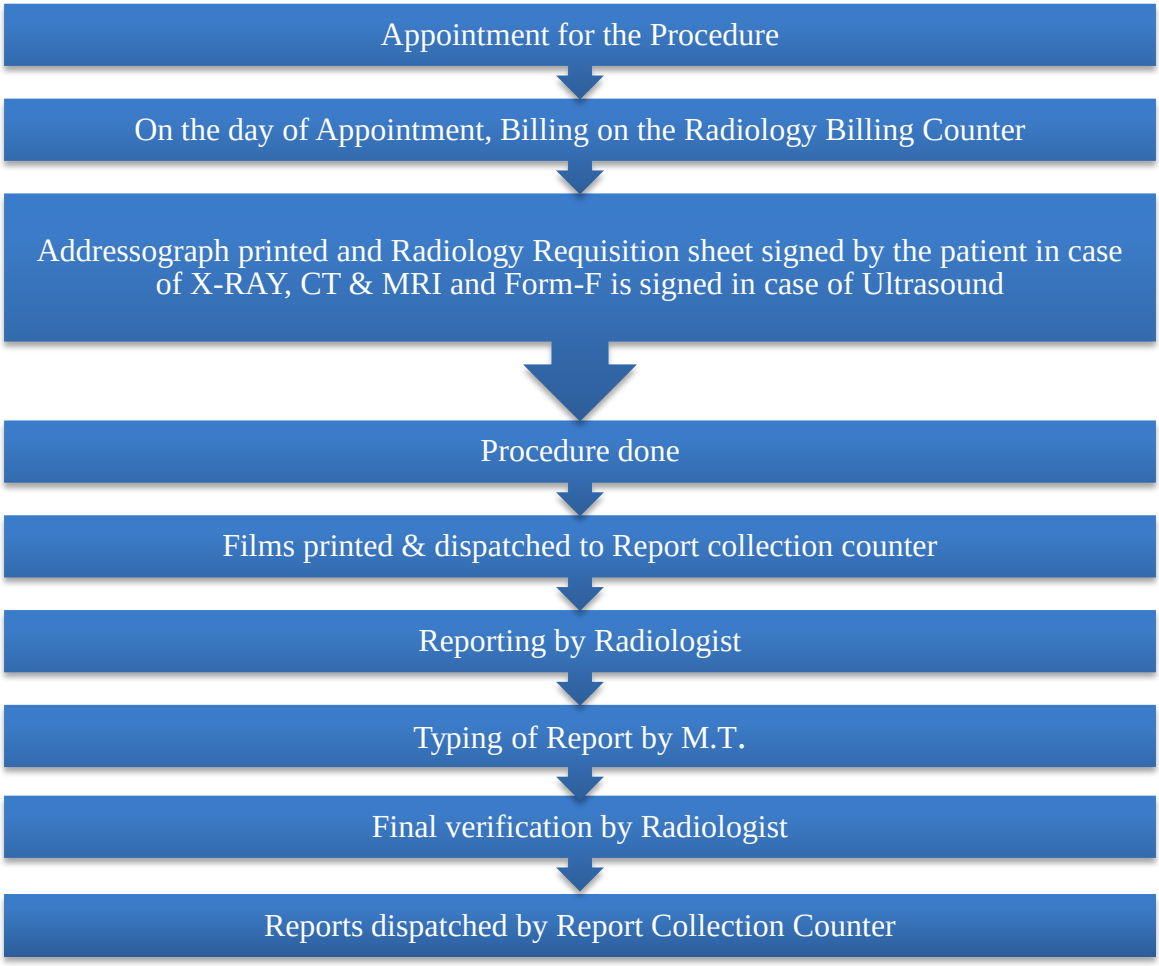


Figure 2.12.1: Process Flow in Radiology

Non- invasive Cardiology:

Procedure done:

1. ECG –Electro cardio gram
2. TMT –Tread mill Test
3. 2-D ECHO –Echocardiogram
4. DSE- Dobutamine stree test
5. TEE-Transoesophageal Echo
6. HOLTER
7. Contrast Echo

Consent form require for TMT ,TEE ,DSE

TMT protocol

- Bruce protocol <50 yr
- Modified bruce protocol70< to>60
- Naughton
- Bully
- Cornell ramprill protocol

Procedure in TMT:

1. Check the age of patient
2. Previous history for cardiac procedure
3. Any abnormality
4. Check B.P
5. Concent take and explain procedure
6. Electrode put on the patient
7. E.C.G record at 3 mins interval

ECHO indication:

- Cardiac arrhythmias and heart disease
- Chest pain in evaluation
- Syncope
- Giddiness
- Sweating

Dobutamine Stress Test –

1-2 hour procedure (<100 kg weight) every 3 min 50 ml syringe (45 ml saline +5 ml dobutamine).

Process of DST

I. Baseline
II. Low lax
III. Peak lax
IV. Recovery

Target HR is (220-age) *85%

CHECK –UPS

Basic heart package

Special heart package

Comprehensive heart package- ECG, TMT

Senior citizen package – ECG, 2D ECHO

Executive citizen policy – ECG, 2D ECHO

Master package - only ECG

D. OPERATION THEATER:

Operation Theatre Complex in Global Hospital is located on 1st floor with the restricted area for outside visitors to minimize the traffic and to maintain the sterility. Nobody is allowed inside the Complex without the Management's or Doctor's permission.

OT Complex is divided into different areas:

1. Recovery Room
2. CT(ICU)
3. Female Doctor/Technician changing room
4. Changing room for Male Doctor /Technicians
5. OT pharmacy
6. 4 OTs
7. 1 scrub station
8. Sterilization room
9. Dirty utility room
10. OT Store Rooms

1) Recovery Room

There are 5 beds in Recovery. Patients to be operated are shifted from wards to recovery around 15-30 minutes before the surgery. Nursing staff in this unit check the vitals of the patients and check that the medicines have been given to the patients or not. After the surgery is over, the patient is brought to recovery with the objective to monitor the patients post-surgery. Critical patients are directly shifted from OT to ICU for monitoring. Cardiac and Neuro surgery patients are shifted from OT to CT ICU and SICU respectively.

3) Catheterisation Lab

Major procedure taking place within the cath lab are CAG and Percutaneous thrombo coronary angioplasty (PTCA). There are overall approx 24 procedures taking place inside the Cath Lab. Cath Lab is divided into console room, procedure room and store rooms.

4) Operation theatres

There are 4operation theatres in OT Complex. Based on specialties they are classified as follows:

OT2&3: Gastro and urology surgery (urology& infected cases are preferred to be done in OT1)

OT 1: CTVS surgery

OT-4 : liver transplant cases

Equipments in OT:

- Operation TablesAnesthesia machine (1 for each OT).
- Laparoscopy machine
- Microscopes.
- Shadow less ceiling lamps
- Patient warmer, used for long cases or if patient is critical. It maintains the body temperature in the range of 32-42 degree Celsius.
- C-Arm Fluoroscopy Machine
- lead aprons and Thyroid shields used with C-Arm Fluoroscopy.
- Crash Cart in OT

OT has HEPA filters (High efficiency particulate air) and laminar flow is maintained inside the OT. Each OT has uninterrupted Power Supply to support the life saving machines and temperature and humidity monitor to keep track on the required levels in Operation.

5) Scrub stations

one scrub stations are there has three taps, one is to take out 10% Betadiene and the other two are for water supply.

6) Utility room

Utility Room is for-

1) Washing soiled linen with sodium hypochlorite.
2) Washing soiled instruments 3M solution.
3) Collecting Biomedical waste in different bins according to the color coding:
   Puncture Proof container - broken Glass
   Red - Infected Plastics: IV sets, gloves, tubing, catheters,
   Yellow - Anatomical and Pathological waste: cotton gauze, etc. contaminated with blood or other body fluids.
   Black - General waste.

OT pharmacy

OT has its separate pharmacy with the total manpower of 2. OT Pharmacy has been given the list of items needed for each surgeries which ease the process. According to the surgeries pharmacy gets all the required medicines and surgical items ready in a very short period of time. Once the operation is over, the nurse or technician provides the list of instruments and medicines used(consumption sheet), which are then added to the patients bills, rest of the medicines are returned.

- **<u>Manpower in OT</u>**

1. Head of Department(Anesthesia)
2. Anesthetists
3. DNB students
4. Nursing staff (assisting surgeons)
5. Technicians (assisting anesthetists)
6. Housekeeping or cleaning staff

Registers maintained:

1) OT schedule: Prepared by the OT senior manager based on appointments and doctors information.

2) OT tracker: To track the time taken
3) General Log book and overtime log book
4) Implant bill receiving file
5) Daily attendance(nursing)
6) OT ETO(Ethylene Oxide) book
7) CSSD book
8) BMW waste
9) Harmonic Register
10) Equipment compliant Register
11) Lab dispatch Register
12) CSSD set

For OT maintenance:

1) Equipment inventory
2) Drug inventory
3) Consumption register

STERILISATION

Maintaining sterility in PACU:

1) The floor is cleaned 2-3 times daily with sodium hypochlorite.
2) For spillage, spill kit is used having PPS (Personal Protective Equipment). PPS includes goggles, scoop, sodium hypochlorite, shoe cover, mask, apron, etc.
3) Fumigation with Lonzagard every Saturday night. Fumigation takes 30 minutes for the process, after that PACU is closed for the whole night.

Sterilisation in OT-

a. After every surgery cleaning of floor is done by sodium hypochlorite and bags of the bins are changed.
b. Different sets of instruments are there for different surgeries. After the surgery, used instruments are washed with 3M and then after drying them they are wrapped in double sheet and sent to CSSD department for sterilization. TAT for unused instrument is 72 hours. ETO objects are also sent to CSSD department after use. TAT for ETO unused objects are 6months.
c. The Laparoscopic instruments are dipped in Disinfection Soaking Tray containing CIDEX (2% Glutaraldehyde) solution for 20 minutes to sterilize them in case those are needed for the next surgery.

d. Once a week fumigation is done with Bacillocide. Usual timings of fumigation is 45min and performed once in a week OT has been kept closed for a night. One OT is kept operational in case there is an emergency.

E.PHARMACY

There are six pharmacy stations in Global Hospital, Hyderabad

1) Central pharmacy- Noori building
2) OT pharmacy- 1st floor
3) OP pharmacy- Ground floor
4) Cathlab pharmacy- Ground floor
5) IP pharmacy- 3rd floor
6) Liver ICU pharmacy- 2nd floor

There are two types of issues from the central pharmacy:

1) Ward issues
2) Departmental issues

Process flow for indent:

Raise indent to central pharmacy (based on consumption of past year)

↓

Raise purchase indent (from Central pharmacy to purchase department)

↓

Based on purchase indent purchase department raises purchase order

↓

Materials received on same day or 1-2 days to central pharmacy with invoice

↓

Goods received notes (GRN) raised by central pharmacy

↓

HIS updated

↓

Goods available

Manpower:

1) Central pharmacy
- HOD-1
- Pharmacist- 2
- Runner boys- 2

2) OP pharmacy- 2 pharmacist
3) IP pharmacy – 3 pharmacist
4) Cathlab pharmacy- 2 pharmacist
5) Liver ICU- 3 pharmacist

F. FLOORS/ WARDS

The total number of beds is 150 which are distributed in 6 floors.

1) Basement: The basement has 5 wards
   Post cath ward- 9 beds
   Radial lounge- 3 beds
   New general ward- 10 beds
   Female general ward- 10 beds
   Male general ward- 12 beds

2) Ground floor:
   Emergency room - 6 beds

3) First floor:
   Recovery room- 4 beds
   Surgical ICU- 6 beds (including 1 isolation bed)
   Cardio-Thoracic ICU- 6 beds

4) Second floor:
   Medical ICU- 4 beds
   Cardiac ICU- 6 beds
   Liver ICU- 10 beds

5) Third floor:
   Cubicle A- 6 beds
   Cubicle B – 6 beds (Surgical High Dependency Unit)
   Cubicle C – 6 beds
   Cubicle D – 6 beds (Cardio-Thoracic High Dependency Unit)
   Bone marrow transplant unit- 3 beds
   Single rooms- 9 beds

6) Fourth floor:
   Deluxe sharing – 10 beds
   Deluxe rooms- 9 beds
   Super deluxe- 6 beds

G. Dialysis unit

Dialysis unit has 8 dialysis machines . Dialysis takes 3-4 hrs. to complete the process. So the appointments given to the patients are in 3 shifts as mentioned under:

- Morning 6-10A.M
- Afternoon 11-2 PM
- Evening 2-6 PM

Manpower:

- 1 Incharge
- 2 staff nurse
- 6 technicians
- 1 housekeeping personnel

TYPES OF DIALYSIS

Acute – 4 hours

Regular -4 hours

SLED -6-8 hours

3 machines for (+ve) cases

5 machines for (-ve) cases

R.O plant- we have our own plant, wwith the capacity of 1500 lt/hr .

150 – 180 lt for 1 dialysis – 4 hr

Scope of services:

- Kidney transplant
- Acute kidney injury
- All type of kidney diseases
- Snake bite cases
- ABO incompatibility transplant
- Renal biopsy
- CRRT
- All types of renal procedure

Process flow in dialysis department:

Patient registration

↓

Patient consultation with doctor

↓

Investigation

↓

Concent forms

↓

Patient come to dialysis , (wt. checked, vitals checked, A-V fistula checked)

Reuse technique:

Blood tubings

- Wash with RO water for 10 mins
- Sodium hypo chlorite dip
- Again wash with R.o water
- Put in formaline for 10-15 mins
- Then again wash with R.O water

DIALYSER

- Wash with R.o water for 10 mins
- Remove blood clots with H2O2 for 10 mins
- Then again wash with R.o water
- Put in formalin for 10 -15 mins & wash with R.O Water
- AERB licensing is mandatory- valid till 5 years

H. EMERGENCY:

It is 24 hour functional & is 6 bedded

Different Areas in Emergency:

- Patient's area (6 beds)
- Store room
- Utility room

Scope of emergency

i. ER provides a comprehensive & uniform emergency service/ care to patient (functional 24*7).
ii. All patients are assessed & triaged by a qualified & experienced medical & paramedical staff & provided appropriate level of care in ER department.
iii. The ER department provides medical evaluation & treatment (including rapid resuscitation & stabilization) .Patients receive medical referral / transfer (including critically ill patients & or those are not in scope of services of hospital)
iv. Emergency care services provided include-
    1. Stabilization of life threatening conditions.
    2. Life saving procedures.
    3. Immediate treatment of medical & surgical emergencies.
    4. Emergency treatment for minor injury or illness.

AMBULANCE TEAM:

Ambulance physician

Anesthetist

Transport boy

Emergency technician

2) Admission process flow

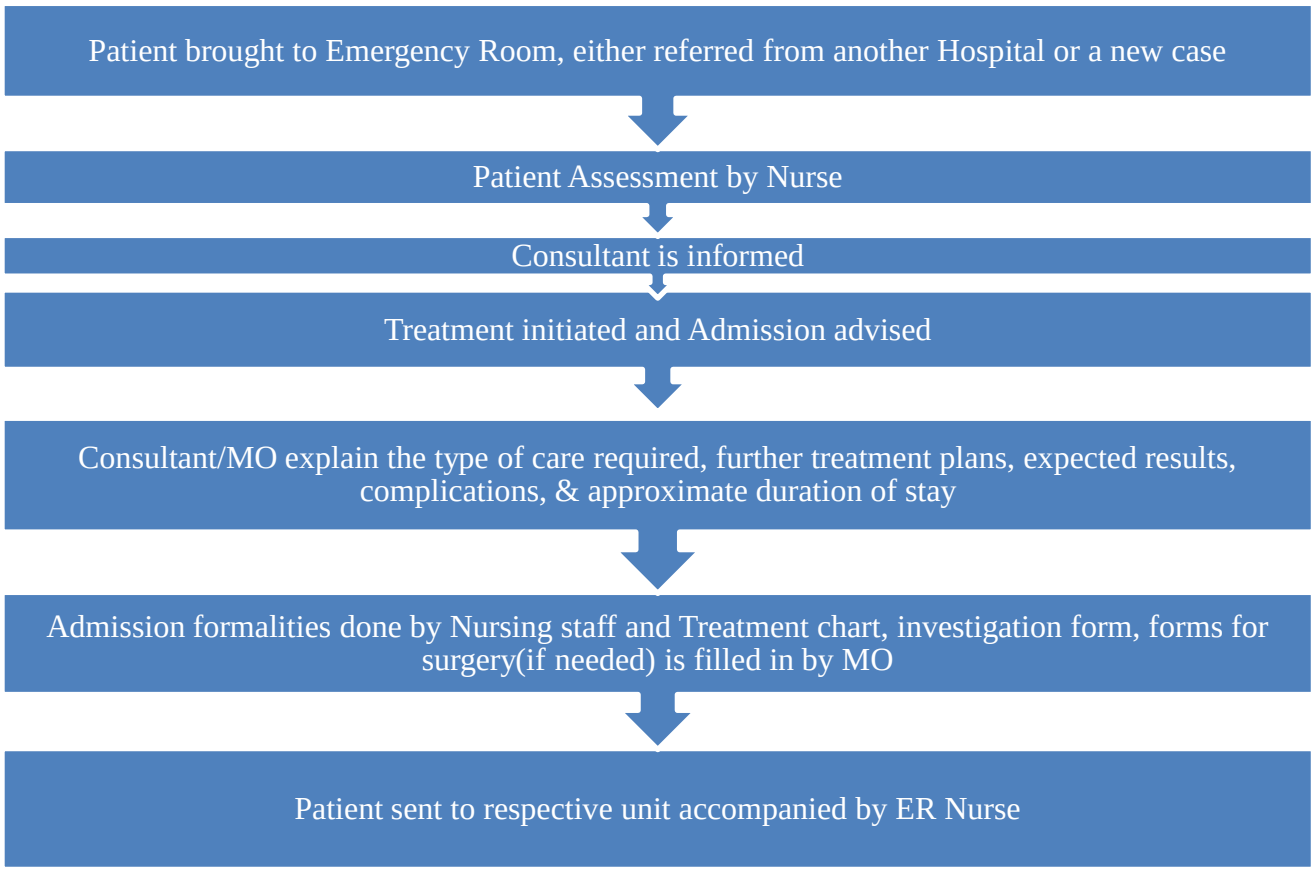


Figure 2.13.2: Process Flow showing admission process in Emergency Dept.

3) MLC cases

It is a case of injury or ailment etc where attending doctor after taking history & doing clinical examination of patient thinks that some investigations by law enforcing agencies are essential so as to fix responsibility regarding the said injury or ailment etc according to law.CMO attending the case, label the case as MLC.

Cases labeled as MLC-

Trauma, burns, electrocution, poisoning, industrial accidents, sexual offences, cases requiring age estimation, criminal abortion, animal or snake bite, cases of coma where cause could not be ascertained, cases of starvation including hunger strike, unclaimed newly born, hanging, strangulation, drowning, suffocation etc, cases brought by police or sent by court for medical examination, BID, where death certification due to disease or natural cause is not possible being not apparent, result of medical malpractices.

4) Process Flow in Triage

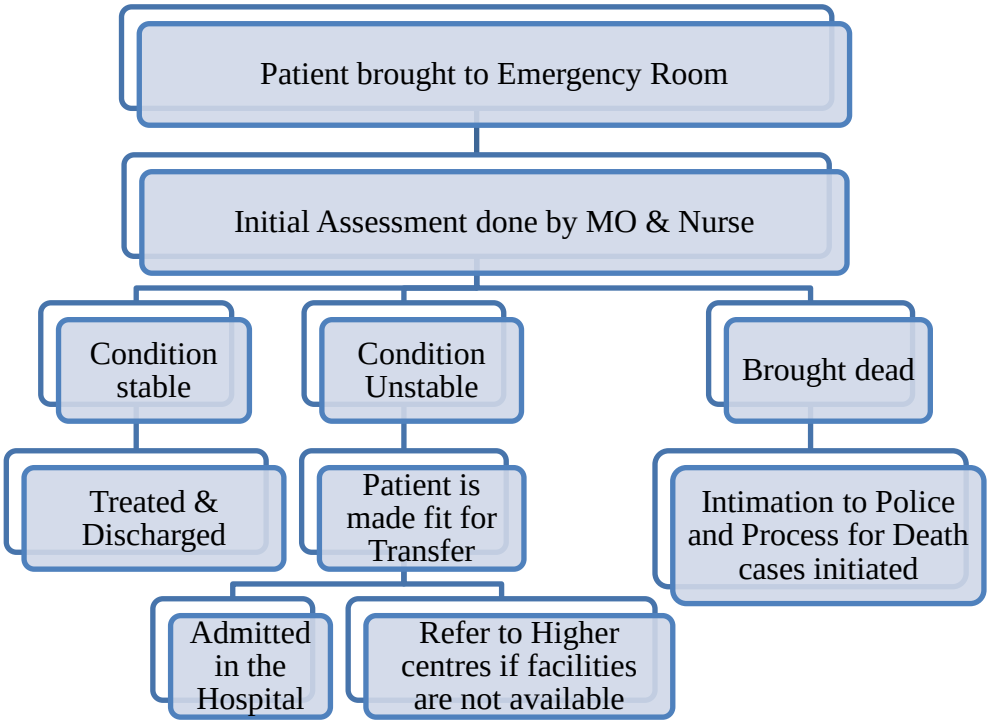


Figure 2.13.3: Process Flow in Triage

5) Important medications used in Emergency Department

High alert medications

These are defined as those which could cause an immediate life threatening condition for the patient if an error in administration occurs.

Narcotic drugs & psychotropic substances (NDPS)

These are drugs which required special storage & issue to prevent misuse, pilferage etc e.g. fentanyl, morphine, pethidine, sufentanyl (also known as Schedule 2 drugs).

Each person independently compares the label & product contents in hand versus the written order & EMAR (if it is the first dose) or label. Double check of medications prior to administration by 2 registered nurses after reading the label is mandatory.

Hospital has made some policies regarding the use of Narcotic Drugs

General guidelines for the Medicines:

- High alert medications dispensed, & administered only on prescription by credentialed personnel / OT/ ICU/ ER in charge doctors to critical care & special care areas
- Double check of Medications prior to Administration by 2 Registered Nurses by reading aloud:
  i) Right medication, Right dose rate, including double check of any calculation & verification of pump settings.
  ii) Right route , including line reconciliation., Right frequency, Right patient.
- High alert medications details will be recorded in Medication Administration Record.
- Storage as per manufacturer packaging instruction.
- Narcotics must be stored under double lock & key.
- In case of expiry/ breakage, excise inspector will be informed accordingly.

Warning labels for all cytotoxic drug containers, as well as shelves

Equipments available-

- Oxygen cylinder
- ECG Machine
- 1 portable ventilator
- Monitors
- Crash cart
- Echo machine
- Defibrillator

- Infusion pumps

  Staffing- nurses , head nurse, housekeeping, 2 E/R Doctors

  3 Ambulance:

  1 small

  2 big ambulance

  Inside of ambulance- centralized AC to avoid dust

  2 oxygen cylinder- 1 running , 1 spare

  1 defibrillator

  Portable ventilator

  Suction- automatic, manual

  2 ambulance kits

I:HOUSEKEEPING DEPARTMENT

Outsourced department to Kancherla Medical Services with annual contract.

LOCATION: 4th Floor

Functions of housekeeping department:

- Cleaning, dusting, mopping, dustbin clearance
- Linen changing
- Provision of bedpans, urinals
- Wheelchair mobilization
- Biomedical waste segregation
- Fumigation and disinfection
- Assisting in nursing services

Staff:
Assistant manager-1
Supervisors-6
Store Supervisor-1
Ayas and wardboys-63

Shifts:
A: 7AM-2PM

B: 1PM-8PM
C: 8PM-8AM

J:FOOD AND BEVERAGE DEPARTMENT

Outsourced department to Kancherla Medical Services

Location: Basement

Services: 6am-10pm

Staff:

Dietician
Assistant Manager-1
Senior executives-1
Billing executives-2
Accounts assistant-1
Purchase assistant-1
Kitchen:
Master-1
Cooks-2
Assistant Cooks-2
Others:5
Stewards:13
Utility:13

Process:
Admission of patient→Nutritional assessment→ Dietician orders→ order taker (F&B) →Steward- order prepared with help→ served to patient
Benchmark-15-20 minutes.

Quality indicators:

Microbial analysis
Swab of surface area
Swab of hands of F&B Staff

K:CRITICAL CARE

Location:

1. Surgical ICU: 6 bedded, 1st Floor
2. Cardiothoracic ICU: 6 bedded, 1st Floor
3. Liver ICU: 10 bedded, 2nd Floor
4. Cardiac ICU: 6 bedded, 2nd Floor
5. Medical ICU: 4 bedded, 2nd Floor

Nurse:Bed ratio- 1:1

Staff:
Intensivists- Senior and Junior
Pharmacist in Liver ICU
Nurses
Ward boys
Physiotherapist
Security

Shifts:
8am-2pm
2pm-8pm
8am-8pm

Process flow:
Emergency/ Operation Theatre/ Ward→ ICU→ Initial assessment→ Doctors initial assessment→ Samples taken for investigations→ Medical and financial counselling→ Consents→ Medical and critical care support→hourly monitoring of vitals→ Progress notes updation/Attendar education→Discharge from ICU to ward/ LAMA.

Quality indicators:

- Bed sores
- Return to ICU within 48 hours
- Re-intubation within 48 hours
- Medication errors
- Adverse drug reactions
- Falls
- Sentinal events
- Accidental removal of catheters

Dissertation Report
on
A Study on assessing the Effectiveness of Inventory Management in a Tertiary Care Hospital

1) Introduction

Inventory is one of the major current assets to the organization. They are important input of final product. It is an area where significant cost savings can be made. Inventory decisions are high risk and high impact from the perspective of financial operation. Inventory, as current asset, differs from other current assets because only financial managers are not involved. Rather, all the functional areas, finance, marketing, production, and purchasing are involved. The job of the financial manager is to reconcile the conflicting viewpoints of the various functional areas regarding the

appropriate inventory levels in order to fulfill the overall objective of maximizing the owners wealth. Raw materials shortages can shutdown a manufacturing line or modify a production schedule, which,

in turn introduces added expenses and potential for finished goods shortages. Just as shortages can disrupt planned marketing and manufacturing operations, over stocked inventories also create problems. Overstocks increases cost and reduce profitability through added warehousing, working capital requirements, deterioration, insurance, tax and obsolescence.

BENEFITS OF INVENTORY MANAGEMENT

♣ Reduced stocking costs resulting from efficient matching of requirements to stock. ♣ Re-order recommendations highlight urgent needs. Help prevent stock-outs.

♣ Instant access to 24 month usage pattern aids decision-making, reveals trends. Old data easily purged.

♣ Automatic capture on audit trail of all stock movement details helps resolve queries.

♣ Instant month-end valuation of receipts, issues, adjustments etc.

♣ Rapid stock and work-in-progress evaluation.

♣ True multi-location without constraints.

♣ Easy monitoring of slow moving stocks.

♣ Automation of inventory checking cycles ensures that items are not forgotten, improves accuracy.

♣ Automatic tracking of scrap rates and recalculation of safety levels reduces effort, improves control.

♣ ABC analysis system focuses attention on high value stock holdings.

CHARACTERISTICS

- The holding of inventory is risky because of the capital investment and the potential for obsolescence.

- Investments for inventory cannot be used to obtain other goods or assets that could improve enterprise performance.

- Funds supporting inventory investment must be borrowed, increasing the firm‟s interest expense. A second form of risk is the possibility that the product will be pilfered or become obsolete.

Historical review of inventory management

Historically, inventory management has often meant too much inventory and too little management or too little inventory and too much management. There can be severe penalties for excesses in either direction. Inventory management have proliferated as technological
progress has increased the organisations ability to produce goods in greater quantities, faster and with multiple design variations. The public has compounded the problem by its receptiveness to variations and frequent design changes]**.**Since the mid 1980s, the strategic benefits of inventory management and production planning and scheduling have become obvious.

Supply costs are of particular concern. A typical hospital spends 25-30% of its budget on medical supplies and their handling. It is seen that health care providers spend more than $100 million on supply chain activities, which was "nearly one-third their annual operating budget." Furthermore, about half of health care providers had supply chains that were described as "immature" based on those providers' survey responses. Inventory Management and Order Management costs may be reduced through the use of inventory control practices.

INVENTORY TECHNIQUES

1) ABC ANALYSIS

ABC analysis underlines a very important principle "Vital few: trivial many". Statistics reveal that only a handful of items account for bulk of the annual expenditure on materials. These few items called „A" items therefore hold the key to business. The other items known as „B" and „C" items are numerous in number but their contribution is less significant. ABC analysis thus tends to segregate all items into three categories: A, B and C on the basis of their annual usage. The categorization so made enables one to pay the right amount of attention as merited by the items.

A – Items: It is hardly found that 5-15% of items account for 70-80% of the total money spent on materials. These items require detailed and rigid control and need to be stocked in smaller quantities. These items should be procured regularly, the quantity per occasion being small. A healthy approach would be to enter into contract with the manufacturers of these items and have their supply in

staggered lots according to production program of the buyer. This, however, will be possible when the demand is steady. Alternatively, the inventory can be kept at minimum by frequent ordering.

B – Items: These items are generally 30% of all items and represent 15% of the total expenditure on the materials. These are intermediate items. The control on these items need not be as detailed and as rigid as applied to C items.

C – Items: There are numerous (as many as 50–60% of the total items), inexpensive (represent hardly 5–10% of the total expenditure on materials) and hence insignificant (do not require close control) items. The procurement policy for these items is exactly the reverse of „A" items. C items should be procured infrequently and in sufficient quantities. This enables buyer to avail price discounts and reduce workload of the concerned departments.

Conducting ABC Analysis:

To conduct ABC analysis, following seven steps are necessary:

1. Prepare the list of items and estimate their annual consumption (units).

2. Determine unit price (or cost) of each item.

3. Multiply each annual consumption by its unit price (or cost) to obtain its annual consumption in rupees (annual usage).

4. Arrange items in the descending order of their annual usage starting with the highest annual usage down to the smallest usage.

5. Calculate cumulative annual usages and express the same as cumulative usage percentages. Also express the number of items into cumulative item percentages.

6. Graph cumulative usage percentages against cumulative item percentages and segregate the items into A, B and C categories.

7. To separate items into A, B and C categories, first few items which contribute between 70 –75% of cumulative usage can be considered as A category, next few items which together with A category items segregated earlier contribute between 80 –90% of cumulative usage can be considered B category, and left over items can be taken as C – category.

2) **VED ANALYSIS**

VED analysis represents classification of items based on their criticality. The analysis classifies the items into three groups called Vital, Essential and Desirable. “Vital” category encompasses those items for want of which production would come to halt. “Essential” group includes items whose stock-outs cost is very high. And “Desirable” group comprises of items which do not cause any immediate loss of production or their stock-out entail nominal expenditure and cause minor disruptions for a short duration.

VED (Vital – Essential – Desirable) analysis is carried out to identify critical items. An item, which usage-wise belongs to C-category, may be critical from production point of view if its stock-out cause heavy production loss.

An item may be vital for a number of reasons, namely:-

1. If the non – availability of the item can cause serious production losses.

2. Lead-time for the procurement is very large.

3. It is non – standard item and is procured to buyer‟s design.

4. The sources of supply are only one and are located far off from the buyer‟s plant.

Steps involved in making VED analysis are as under:

1)Identify the factors to be considered for VED analysis: These commonly considered factors affect on production (i.e. stock out cost in the event of its non availability), lead-time, and nature of the item and sources of supply.

2) Assign points/weightages to the factors according to their importance to the company. Typical examples of the weightages to the above four factors may be 30, 30, 20 and 20 points.

Divide each factor into three degrees and allocate points to each degree. Usually, the first degree is assigned points equal to the weightage of its factor; second degree is allocated points equal to twice

the weightage of the factor and third degree is assigned points equal to thrice the weightage of the factor.

Prepare categorization plan (shown below), which provides the basis of classification of items into vital, essential and desirable categories. Evaluate items one by one against each factor and assign points to the item depending upon the extent of presence of the factor in the item Place the items into V, E and D categories depending upon the points scored by them (table below) and basis of classification set under step

3) F – S – N ANALYSIS

F – S – N analysis is based on the consumption figures of the items. The items under this analysis are classified into three groups:

1. F (fast moving)
2. S (slow moving)
3. N (Non – moving)

To conduct the analysis, the last date of receipt or the last date of issue whichever is later is taken into account and the period, usually in terms of number of months that has elapsed since the last movement is recorded.

Such an analysis helps to identify:

1. Active items, which require to be reviewed regularly.

2. Surplus items whose stocks are not being consumed. The last two categories are reviewed further to decide on disposal action to deplete their stocks and thereby release company's productive capital

3. Non – moving items which are not being consumed.

2) Review of Literature

A study conducted by Shashi Kant et al on effective management of medical stores entails supervision of important drugs, and priority setting in purchase and distribution of drugs. Studies have mainly explored the inventory management at tertiary-care settings. The main objective of this study was to explore the optimal drug inventory management technique suitable for a secondary care hospital. The methods used included procurement, consumption, and expenditure data was analysed at the secondary level. The annual procurement of, and expenditure incurred on drugs for financial year 2012-13 was analysed using inventory control techniques, based on expenditure (ABC), criticality (VED), and a combination matrix of ABC-VED. Results: Total annual expenditure on 182 drugs was Rs 6,495,785 amounting to 21% of hospital budget for the financial year 2013-14. ABC-VED matrix analysis system is an optimal drug inventory management system at a secondary health care setting.

A study conducted by Dwivedi, et al emphasizes that cost analysis plays a pivotal role in the management of pharmacy store. About one-third of the hospital budget is spent on purchasing materials and supplies including medicines. 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 buying items. To explore the feasibility of alphabetical analysis where items are classified into A, B and C categories depending on their annual consumption value, in effective management of pharmacy store. The study suggested that review for expensive drugs could bring out 20% savings in pharmacy store budget and the main goal of inventory management involves having to balance the conflicting economics of not wanting to hold too much stock. The inventory management can bring out significant improvement not only in patient care but also in the optimal use of resources. Results stated that continuous management can provide the value added services to the patients.

A study was conducted by Holm et al which focuses on medication supply chain management through implementation of a hospital pharmacy computerized inventory program in Haiti**.** In the aftermath of the 2010 earthquake in Haiti, St. Luke Hospital was built to help manage the mass casualties and subsequent cholera epidemic. A major problem faced by the hospital system was the lack of an available and sustainable supply of medications. Long-term viability of the hospital system depended largely on developing an uninterrupted medication supply chain..It was noticed that the implementation of a new Pharmacy Computerized Inventory Program (PCIP) would optimize medication availability and decrease medication shortage. An efficient, customizable, and cost-sensitive PCIP can improve drug inventory management in a simplified and sustainable manner within a resource-constrained hospital.

A study was conducted by Sit Fairuz Mohd Razali in which A pharmacy stock inventory system (PSIS) is a computerized system designed for user to manage the stock of the drugs inventory and monitoring the stock facility. The stand alone pharmacy stock inventory system provides alert of expire drugs and minimum quantity of each drugs and also searching algorithm technique applied in this system. A research and analysis on the current system and searching technique was done to get better understanding of the system. The RAD methodology was used in this project development implements iterative development which is suitable for stand alone applications requirements that changes from time to time. Testing is done every phase of the development life cycle to make sure that the system working properly. This project was developed using Visual Basic 6.0 and Microsoft Access 2000 as a database platform. As a final result, this system was fulfilled all the research objectives. This research was successfully developed the PSIS prototype system, computerized and optimized the current system using String Search Algorithm.

A study was conducted by Monton, et al on the topic purchasing and inventory management by pharmacist of a private hospital in Northeast of Thailand Objective: The aim of this study was to improve the purchasing and inventory management system to transparent and checkable manner, before and after the improved system were compared. Methods: The retrospective data including rate of approved purchasing documents, rate of inspected products, rate of correct received products, rate of destroyed or expired products, rate of reserved products, and rate of product shortages during January 2010 to December 2011were collected. The identified problems of purchasing and inventory management were solved by improving the purchasing and inventory management system. The key performance indicators during January 2012 to May 2012 were collected. The improved results were compared. Results: After the purchasing and inventory management system were adopted, rate of approved purchasing documents and rate of inspected products in the first five months were 100%. Rate of correct received products was higher than 95%. Rate of destroyed or expired products was less than 0.5%. Rate of reserved products was less than 3 months. Rate of product shortages for all observed five months was less than 1%. Conclusion: The improved purchasing and stock management system, which has been developed by pharmacists was successful. All purchase documents and received products were 100% approved and inspected by administrative team. Rate of correct received products was increased. Rate of destroyed or expired products and rate of product shortages were decreased.

3) Rationale of the Study

- Since Drug expenditure is the main component of hospitals expenditure, Drug inventory control is an interesting area to study and also with applying the inventory control techniques there will be a reduction in inventory holding days which will lead to reduction in Hospital Expenditure and will lead to rise in hospital revenue.

4) Research Methodology

✓ *OBJECTIVE OF THE STUDY* :

- To access the current status of Inventory Management
- To apply appropriate Inventory control tools for Optimum Utilization of Inventory

✓ ***RESEARCH DESIGN*** :-

The Study Design used for this Project is Descriptive Observational Study

The Data was closely Observed and Analyzed.

✓ ***DURATION*** **:-**

This Study was carried out from 15th March - 30th April 2015

✓ ***STUDY CONTENT***:

- All drugs and consumables at the Central Store
- All Drugs and consumables at the sub stores which cover OT pharmacy, LICU Pharmacy, OP Pharmacy , IP Pharmacy, Cath Lab Pharmacy

✓ ***SAMPLE SIZE*** **:**

- Central Stores=2759 Drugs and Consumables
- OT Pharmacy=886 Drugs and Consumables
- OP Pharmacy=1161 Drugs and Consumables
- IP Pharmacy=1554 Drugs and Consumables
- Cath Lab Pharmacy=390 Drugs and Consumables.

✓ ***SAMPLING TECHNIQUE*** : The sampling technique selected was Random Sampling.

❖ *DATA COLLECTION:*

- PRIMARY DATA :

Information on all Drugs and Consumables of Central Store and Sub Stores were taken from the system and mathematically calculated as A, B and C items.

Criticality of the items were analyzed by doing the V, E, D analysis after interviewing the pharmacists of the sub-stores and HOD of the main store.

- SECONDARY DATA :

Information about the Drugs and Consumables were taken from the Kranium System of the Hospital. After Observing the data it was analyzed on Microsoft Excel.

5)Plan of Execution :

1) The Data was taken from the System which covered the main store also known as the Central Store and all the Sub-stores which included- OP pharmacy, IP pharmacy, Cath Lab Pharmacy, OT pharmacy, and LICU pharmacy.
2) The Data was collected was for the period of Jan – March 2016 (3 months data analyzed)
3) First the items were segregated as A, B, C items on the basis of mathematical calculation. The A items constituted 80% of the whole cost of items, B items constituted 15% of the whole cost of items, and C items constituted 5% of the cost of the whole items.
4) After that the items were segregated on the basis of criticality of drugs in that particular department as V, E, D(Vital, Essential and Desirable) Items after interviewing the pharmacists and HOD of the Department.
5) Then the Consumption of three months was seen and according to that one month consumption was calculated.
6) On the basis of one month consumption the Drugs and Consumables were classified as Fast, Slow and Non Moving items.
7) After the analysis of data on the basis of "A,B , C", "V, E D" and F, S, N Items the calculation for reduction in Inventory holding days was made as follows:-
   - Central Store = 14 Days stock +7 Days Safety Stock(For Vital Items),
   - Total 21Days
     = 14 Days stock + 4 Days Stock (For Essential items),
     Total 18 Days
     = 14 Days stock +0 Days Stock (For Desirable Items),
     Total 14Days
   - OT pharmacy = Total 7 days stock
   - LICU Pharmacy =Total 7 days stock
   - IP Pharmacy =Total 7 Days Stock
   - OP Pharmacy =Total 7 days stock
   - Cath Lab Pharmacy=Total 7days stock
8) After that the Total no of Stock was seen in different stores and surplus stock which was present was sent to the supplier and incase of less stock the stock was ordered weekly.
9) To conduct the VED and FSN analysis out of A, B, and C items sample size was taken as A and B items.

6) Analysis:

1) Central Stores:-

- ABC Analysis

The total no of items under observation =2754(Jan to March)

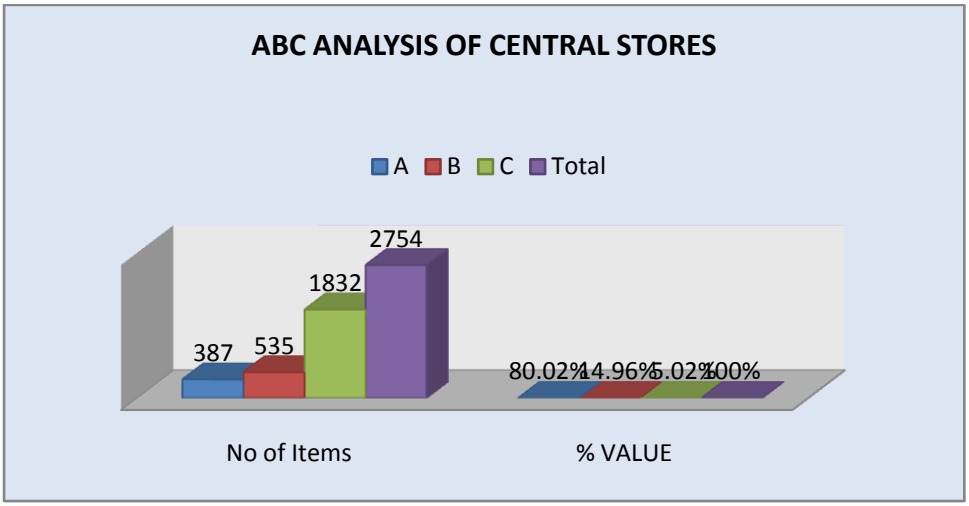


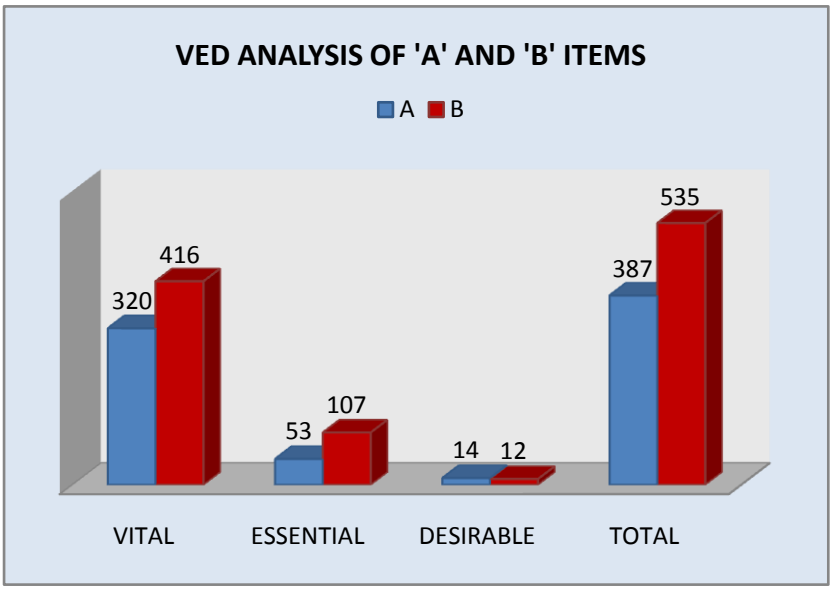
Fig 1

From the above figure 1 we can find out that out of total Drugs and Consumables which were 2754 (Jan – March), The A items are 387 in number which constitutes about 80.02% of the total value of items. The B items were 535 in number which constituted about 14.96% of the total value of items. The C items were 1832 in number which constituted around 5.02% of the total value of items

- VED Analysis :-

The total items under observation were 922 were comprised of A and B items under study.

Fig 2



From fig 2 we can find out that out of the total sample size of 922 items it was seen that there were 320 Vital items, 53 Essential items and 14 Desirable Items under “A” category and there were 416 Vital Items, 107 Essential items and 12 Desirable Items under “B” Category.

- **FSN ANALYSIS**

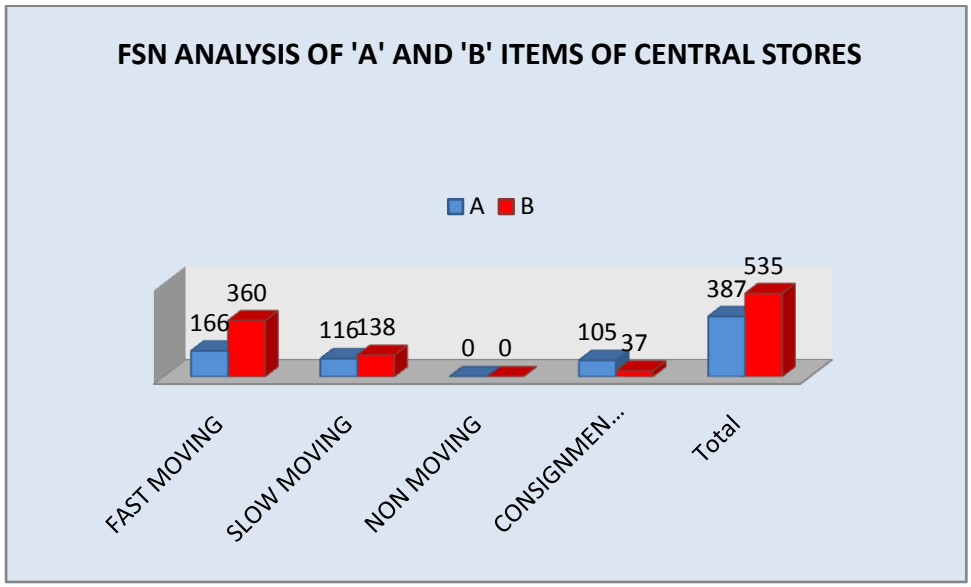


Fig 3

It seen from fig 3 that out of the total sample size of 922 items it was seen that there were 166 Fast moving Items , 116 Slow moving items, 0 non moving items and 105 Consignment Basis Stock under “A” category and there were 360 Fast Moving Stock, 138 Slow moving stock, 0 Non moving Stock and 37 Consignment Basis Stock under “B” Category.

2) OT Pharmacy

- ABC Analysis

The total no of items under observation =886

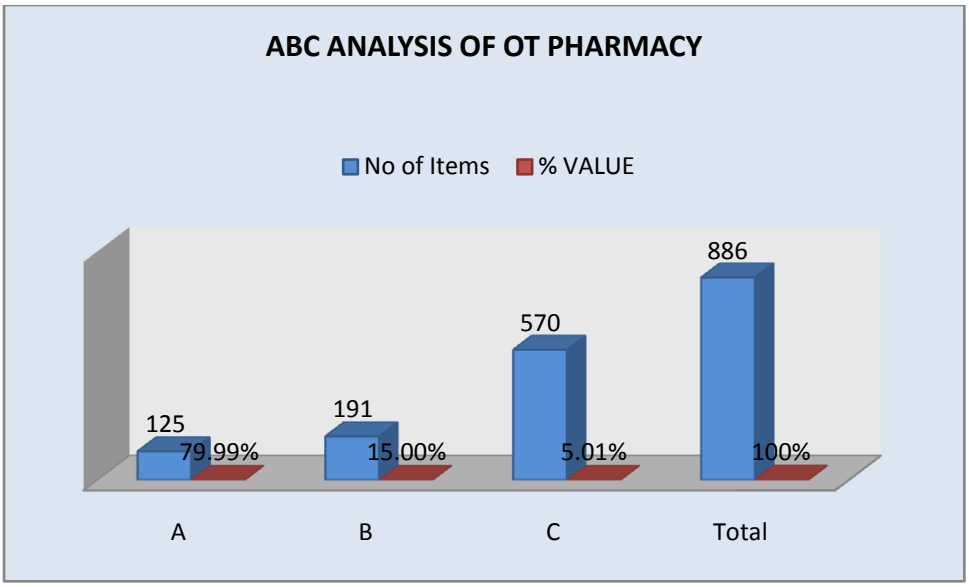
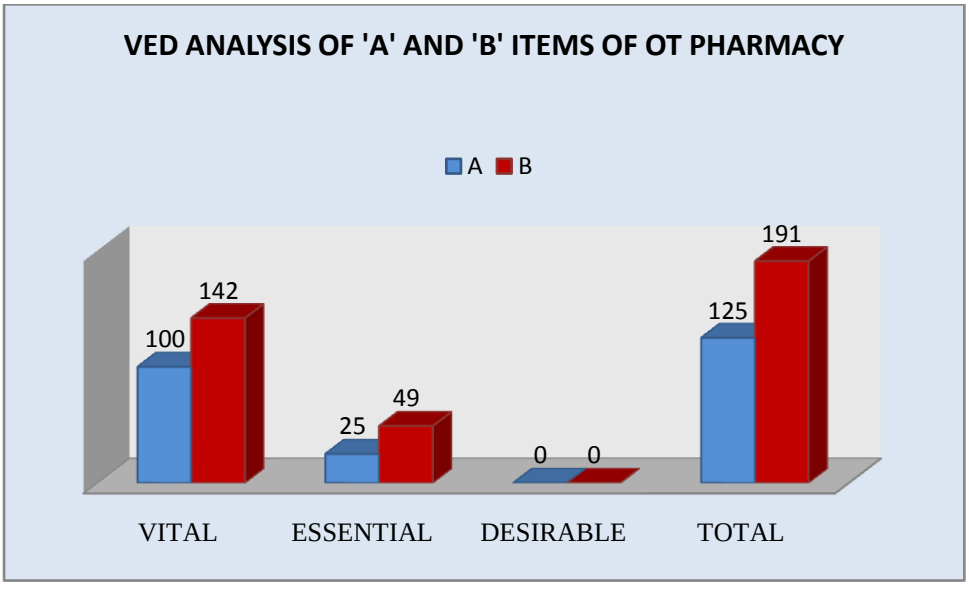


Fig 4

From the above figure we can find out that out of total Drugs and Consumables which were 886, The A items are 125 in number which constitutes about 79.99% of the total value of items. The B items were 191 in number which constituted about 15.00% of the total value of items. The C items were 570 in number which constituted around 5.01%% of the total value of items

- VED Analysis :-

  The total items under observation were 316 were comprised of A and B items under study.



From the above figure we can see that out of the total sample size of 316 items it was seen that there were 100 Vital items, 25 Essential items and 0 Desirable Items under "A" category and there were 142 Vital Items, 49 Essential items and 0 Desirable Items under "B" Category.

- **FSN ANALYSIS**

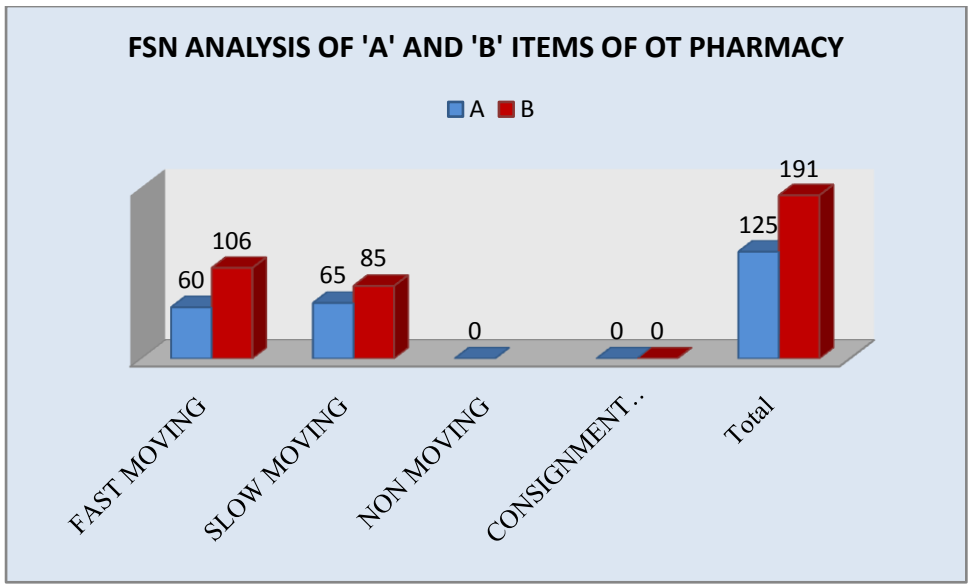


Fig 6

From the above figure we can see that out of the total sample size of 316 items it was seen that there were 60 Fast moving Items , 65 Slow moving items, 0 non moving items and 0 Consignment Basis Stock under "A" category and there were 106 Fast Moving Stock, 85 Slow moving stock, 0 Non moving Stock and 0 Consignment Basis Stock under "B" Category.

3) Cath Lab Pharmacy:

- ABC Analysis
  The total no of items under observation =390

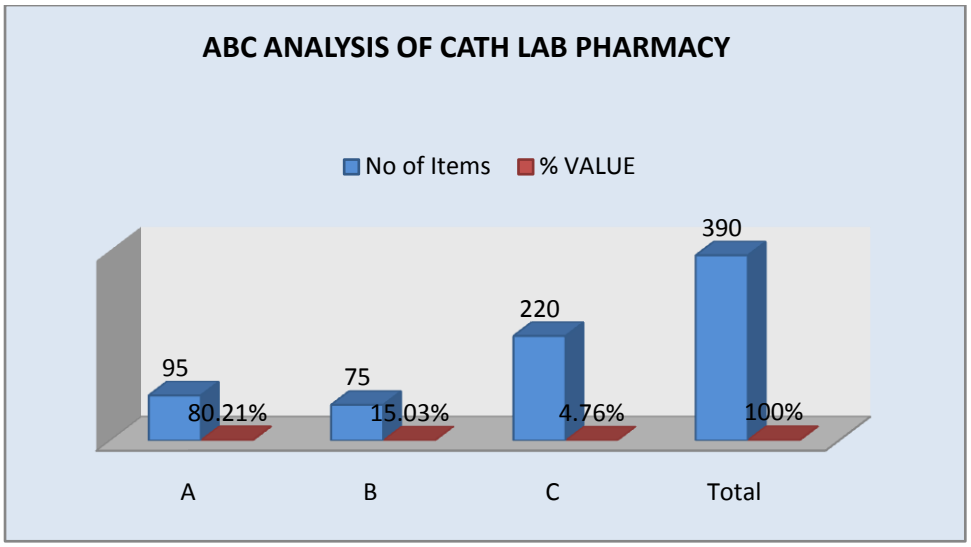


Fig 7

From the above figure we can find out that out of total Drugs and Consumables which were 390, The A items are 95 in number which constitutes about 80.21% of the total value of items. The B items were 75 in number which constituted about 15.03% of the total value of items. The C items were 220 in number which constituted around 4.76% of the total value of items

- VED Analysis :-

  The total items under observation were 170 were comprised of A and B items under study.

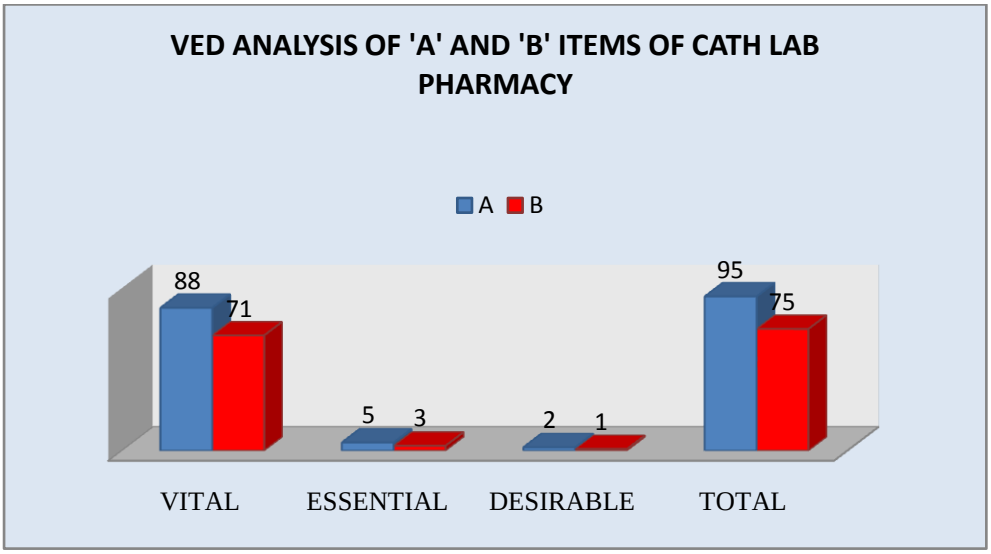


Fig 8

From the above figure we can find out that out of the total sample size of 170 items it was seen that there were 88 Vital items, 5 Essential items and 2 Desirable Items under “A” category and there were 72 Vital Items, 3 Essential items and 1 Desirable Items under “B” Category.

- **FSN ANALYSIS**

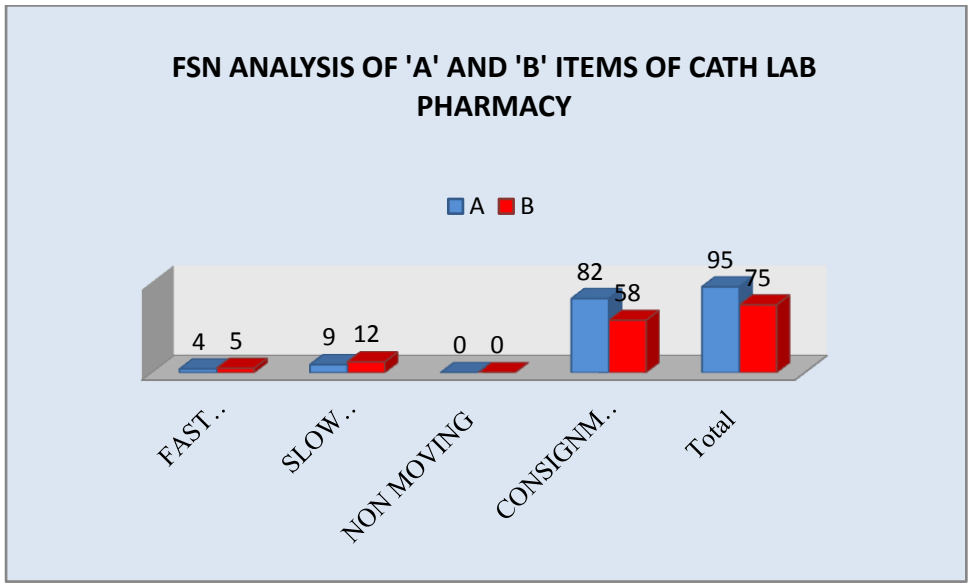


Fig 9

From the above fig we can find out that out of the total sample size of 170 items it was seen that there were 4 Fast moving Items , 9 Slow moving items, 0 non moving items and 82 Consignment Basis Stock under “A” category and there were 5 Fast Moving Stock, 12 Slow moving stock, 0 Non moving Stock and 58 Consignment Basis Stock under “B” Category.

4) IP PHARMACY:

- ABC Analysis

The total no of items under observation =1554

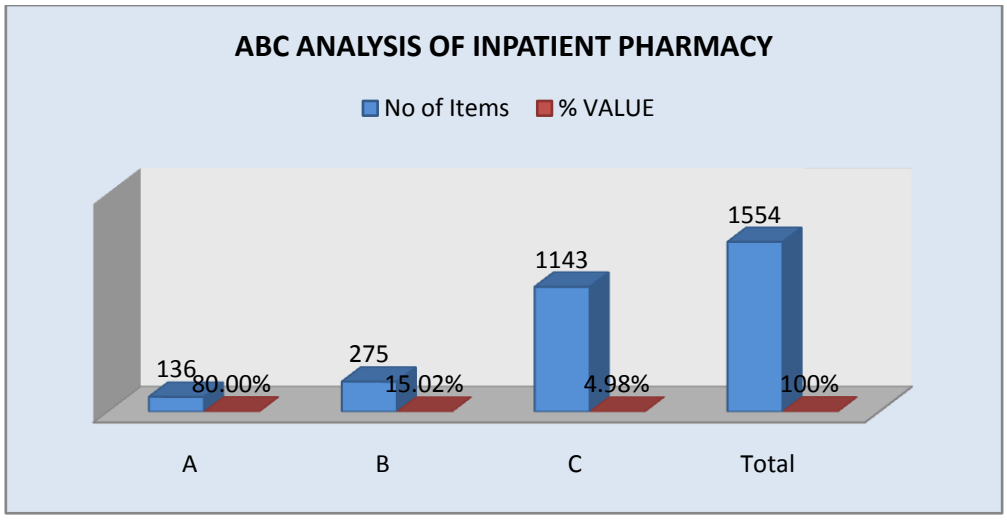


Fig 10

From the above figure we can find out that out of total Drugs and Consumables which were 1554, The A items are 136 in number which constitutes about 80.00% of the total value of items. The B items were 275 in number which constituted about 15.02% of the total value of items. The C items were 1143 in number which constituted around 4.98% of the total value of items.

- VED Analysis :-

  The total items under observation were 411 were comprised of A and B items under study.

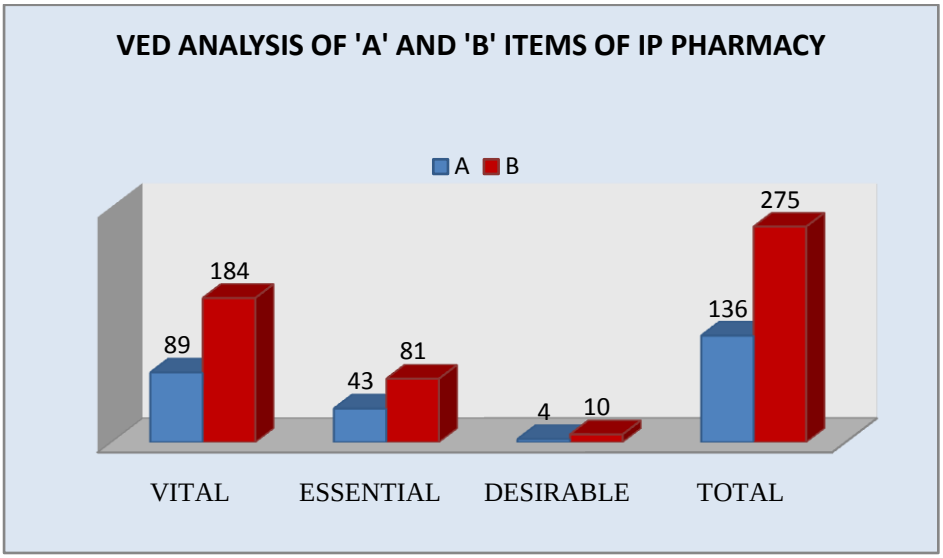


Fig 11

From the above fig we can find out that out of the total sample size of 411 items it was seen that there were 89 Vital items,43 Essential items and 4 Desirable Items under "A" category and there were 184 Vital Items, 81 Essential items and 10 Desirable Items under "B" Category.

- **FSN ANALYSIS**

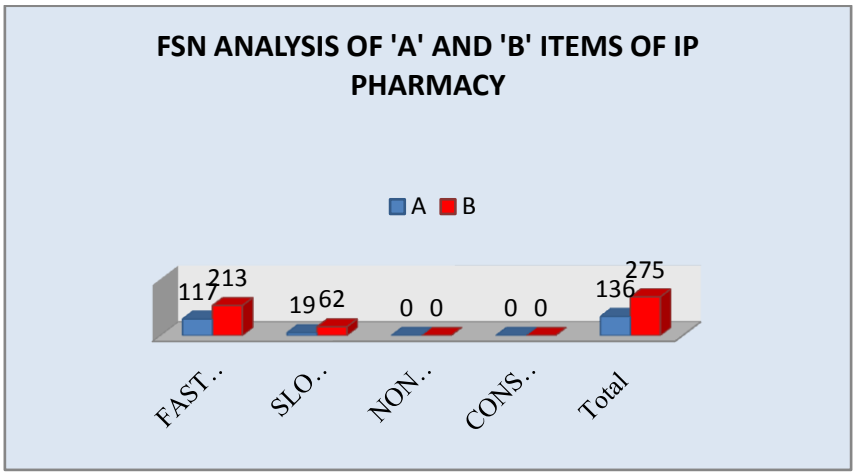


Fig 12

It is seen from the above fig that out of the total sample size of 411 items it was seen that there were 117 Fast moving Items , 19 Slow moving items, 0 non moving items and 0 Consignment Basis Stock under "A" category and there were 213 Fast Moving Stock, 62 Slow moving stock, 0 Non moving Stock and 0 Consignment Basis Stock under "B" Category.

5) Outpatient Pharmacy:

- ABC Analysis

  The total no of items under observation =1161

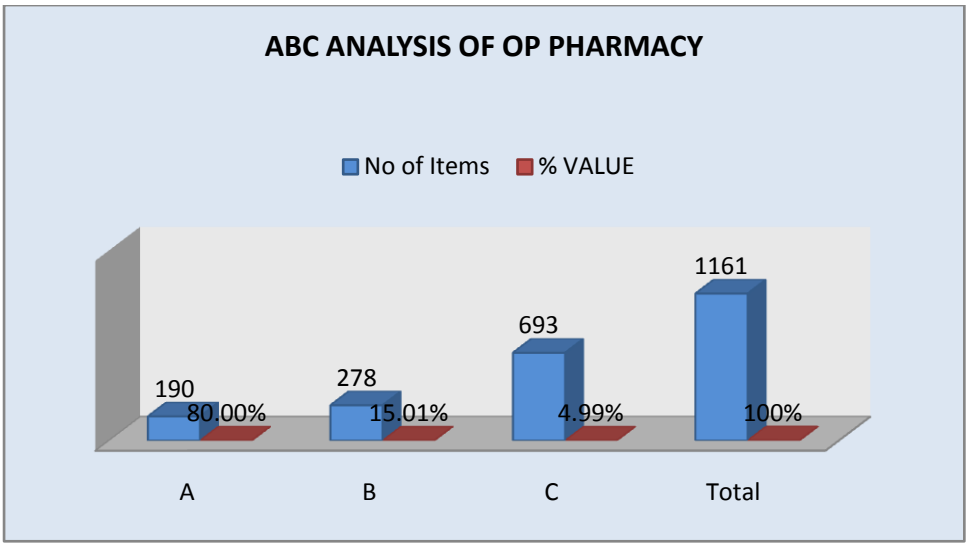


Fig 13

From the above figure we can find out that out of total Drugs and Consumables which were 1161, The A items are 190 in number which constitutes about 80.00% of the total value of items. The B items were 278 in number which constituted about 15.02% of the total value of items. The C items were 693 in number which constituted around 4.99% of the total value of items

- VED Analysis :-

  The total items under observation were 468 were comprised of A and B items under study.

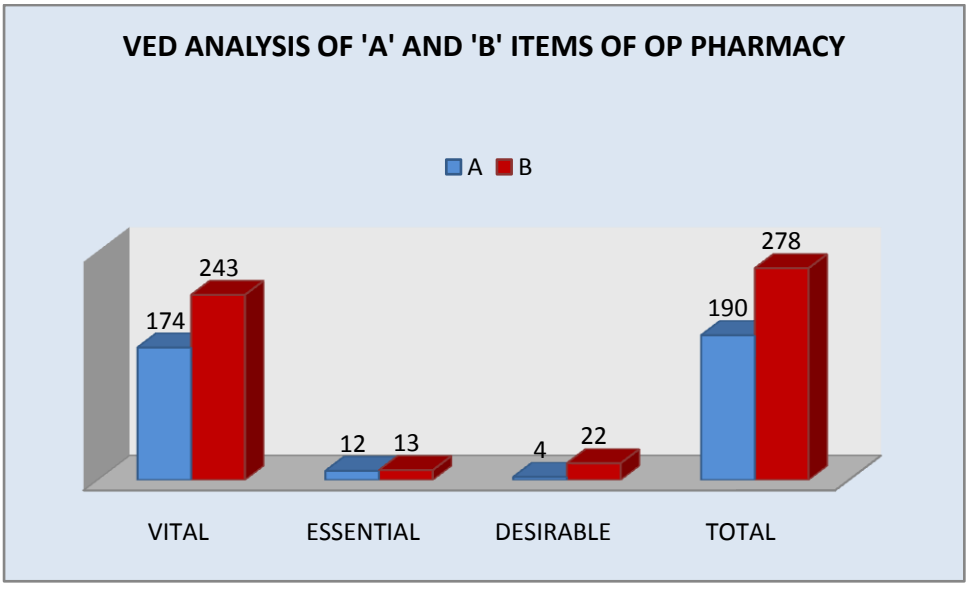


Fig 14

It is seen from the above figure that out of the total sample size of 468 items it was seen that there were 174 Vital items,12 Essential items and 4 Desirable Items under "A" category and there were 243 Vital Items, 13 Essential items and 22 Desirable Items under "B" Category.

- **FSN ANALYSIS**

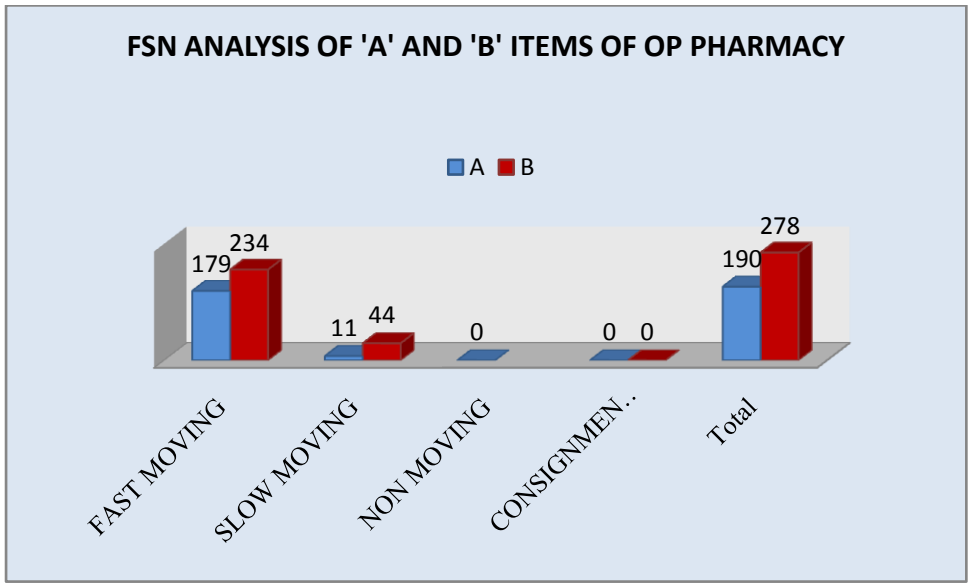


Fig 15

It is seen from the above figure that out of the total sample size of 468 items it was seen that there were 179 Fast moving Items , 11 Slow moving items, 0 non moving items and 0 Consignment Basis Stock under "A" category and there were 234
Fast Moving Stock, 44 Slow moving stock, 0 Non moving Stock and 0 Consignment Basis Stock under "B" Category.

6) LICU Pharmacy:

- ABC Analysis

The total no of items under observation =876

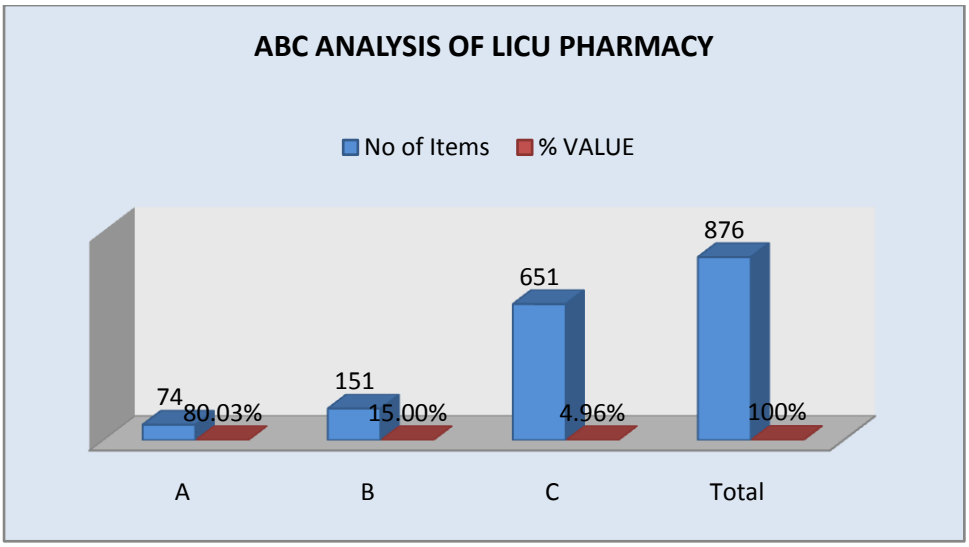


Fig 16

From the above figure we can find out that out of total Drugs and Consumables which were 876, The A items are 74 in number which constitutes about 80.00% of the total value of items. The B items were 151 in number which constituted about 15.00% of the total value of items. The C items were 651 in number which constituted around 4.96% of the total value of items

- VED Analysis :-

  The total items under observation were 225 were comprised of A and B items under study.

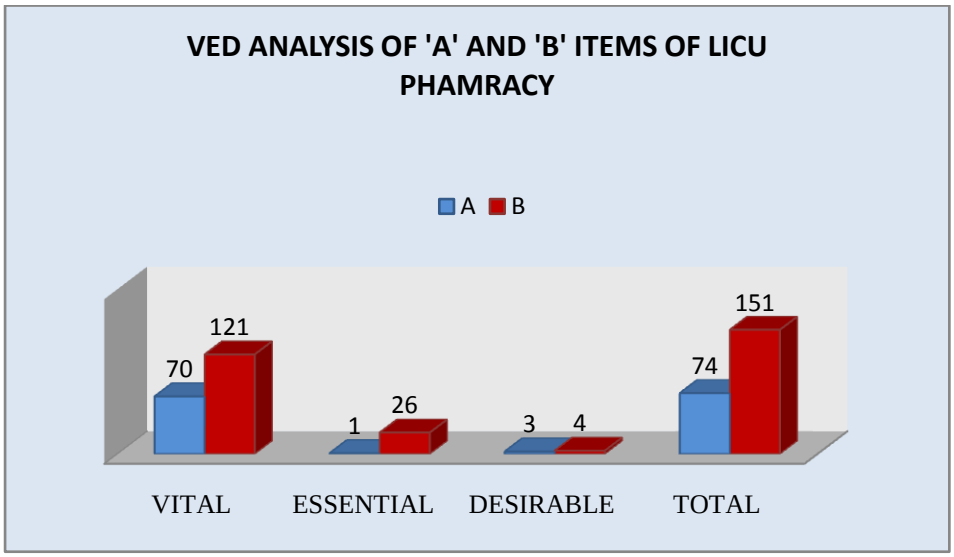
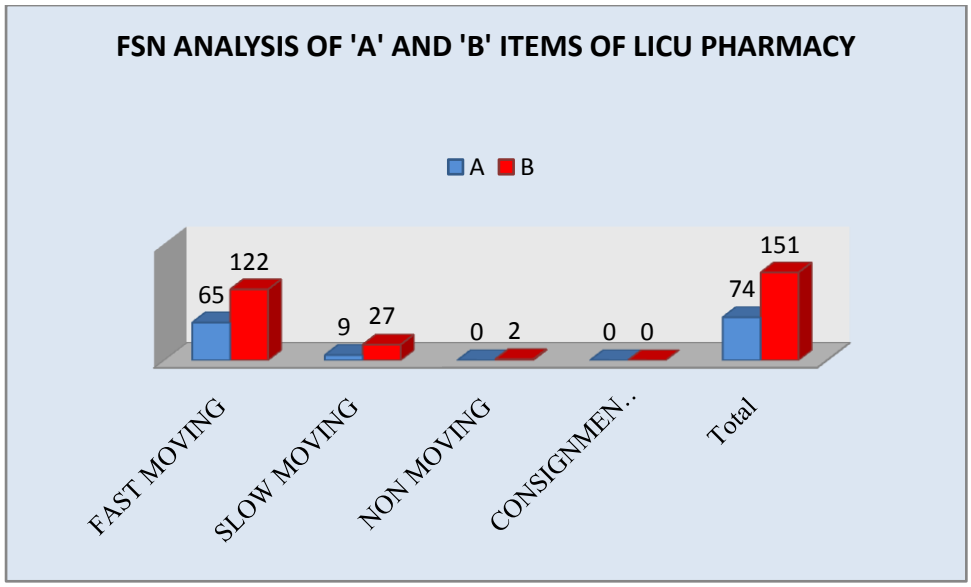


Fig 17

It is seen from the above fig that out of the total sample size of 225 items it was seen that there were 70 Vital items,1 Essential items and 3 Desirable Items under "A" category and there were 121 Vital Items, 26 Essential items and 4 Desirable Items under "B" Category.

- **FSN ANALYSIS**

The total items under observation were 225 items which comprised of 'A' and 'B' items under study.



It is seen from the above figure that out of the total sample size of 225 items it was seen that there were 65 Fast moving Items , 9 Slow moving items, 0 non moving items and 0 Consignment Basis Stock under "A" category and there were 122

Fast Moving Stock, 27 Slow moving stock, 2 Non moving Stock and 0 Consignment Basis Stock under "B" Category.

7) Overall Findings

- Consignment basis stock are only present in Cath lab hence it would cause no hindrance to the stocks as they don't carry any inventory holding cost.
- It was found out that the drugs were merely arranged as per alphabetical order and the reordering of the stocks was on random basis.
- There was no categorization of items as ABC, VED and FSN analysis.
- Some drugs were sent back to the vendor after they expire so an account of near expiry drugs should be maintained.

8) Recommendations:

1) Items which are non moving i.e which have been in the stores for more than 180 days should to be returned to the vendors before they expire
2) .Only optimum stock should be maintained for rare items.
3) The consignment basis stock should not be invoiced before consumption.
4) Re-Order levels should be based on consumption on monthly basis.
5) First in First out method should be applied to prevent expiry of drugs.
6) The drugs were arranged as per ABC, VED and FSN as it leads to an organised form in which inventory can be controlled.
7) To sustain the initiative, it is important to supervise the system in monthly BRM meetings to keep a regular check on the stock status.

9) References

1) Shashi Kant et al ,Inventory Management of Drugs at a Secondary Level Hospital Associated with Ballabgarh HDSS- An Experience from North India , Journal of Young Pharmacists Vol 7 , Issue 2 , Apr-Jun 2015.
2) Monton, et al , Purchasing and inventory management by pharmacist of a private hospital in northeast of Thailand. International Journal of Pharmacy and Pharmaceutical Sciences ISSN-0975-1491 Vol 6, Issue 5, 2014
3) Dwivedi et al, Medical Store Management: An Integrated Economic Analysis of a Tertiary Care Hospital in Central India, Journal of Young Pharmacists Vol 4 / No 2