

Departmental Consumption Analysis and Scope for Improvement

By

Shaleen Vasishta

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

Academic year, 2014-2016



The IIHMR University, Jaipur

1, Prabhu Dayal Marg, Sanganer Airport
Jaipur-302029, Rajasthan
Ph: 0141 3924700, Fax: 3924738
Website: www.iihmr.edu.in

Internship Training

At

Global Hospitals, Hyderabad

“Departmental Consumption Analysis and Scope for Improvement”

By

Dr.ShaleenVasishta

Under the guidance of

Dr.AlokMathur

MBA Hospital and Health Management

2014-16



The IIHMR University, Jaipur

TO WHOMSOEVER MAY CONCERN

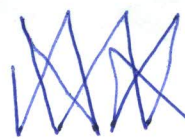
This is to certify that **Dr. Shaleen Vasishta** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone dissertation training at **Global hospital, Hyderabad** from 8th February ,2016 to 7th May, 2016.

The Candidate has successfully carried out the study designated to her during dissertation training and her approach to the study has been sincere, scientific and analytical. This training is in fulfillment of the course requirements.

I wish her all success in all future endeavors.



Dr. Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur



Dr. Alok Mathur
Associate Professor
The IIHMR University, Jaipur

16/5/2016

The certificate is awarded to

Name: **Dr. Shalen Vasishta**

In recognition of having successfully completed her
internship in the department of
Title: **Dialysis**

and has successfully completed her Project on
Title of the Project: **Departmental consumption analysis (DIALYSIS)**

Date 6th MAY, 16.

Organisation: **GLOBAL HOSPITALS**

She comes across as a committed, sincere & diligent person who has a
strong drive and zeal for learning
We wish him/her all the best for future endeavors
Training & Development


(K. KARTHIKESWAR)
Asst. Gen. Manager - Internal Audit,
Guide


AGM
Unit Head Human Resources

A unit of Ravindranath GE Medical Associates Pvt. Ltd.

Global Hospitals, 6-1-1070/ 1to4, Lakdi-ka-pool, Hyderabad - 500 004
Ph.: +91 40 2324 4444 (10 lines), Fax : +91 40 2324 4455

Aware Global Hospitals, 08-16-01, Sagar Road, Saroornagar (L.B. Nagar),
Hyderabad - 500 035 Ph.: +91 40 2411 1111 Telefax : +91 40 2403 2366

info@globalhospitalsindia.com www.globalhospitalindia.com

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This is to certify that the dissertation titled **Departmental Consumption Analysis** and submitted by **Dr. Shaleen Vasishta** Enrollment No. 0210 under the supervision of **Dr. Alok Mathur** for award of MBA in Hospital and Health Management of the University carried out during the period from **2014** to **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.

Signature



Abstract

Departmental Consumption Analysis of Dialysis department of Global Hospital, Hyderabad

ShaleenVasishta

BACKGROUND: Departmental consumption is calculation of overall resources that are utilized to run a department in any tertiary hospital. It is important to calculate if there is any over or underutilization of resources in order to have good revenues. It increases the revenue, decreases the holding stock, and therefore leads to proper utilizations of resources by a particular department. If each of the department performs well then it ultimately leads to an overall success of the hospital.

OBJECTIVES:

- To calculate overall departmental consumption in dialysis department.
- To find out Scope for improvement.

METHODOLOGY:

- Time duration from 15th march to 15th April 2016.
- Prospective study
- Sample size- Dialysis department covered 432 patients

RESULT: Overall departmental consumption was carried out from 15th march to 15 April, 2016. It included the overall consumption of human resources, electricity, water and material consumption which came out to be Rs. 923000, Rs. 203498, and Rs. 16500 respectively. Material consumption was calculated separately according to the 3 cases which came out to be Rs.893.47 for SLED, Rs.990.25 for acute and Rs.509.18 for regular.

CONCLUSIONS & SUGGESTIONS:

Optimum utilization of manpower & machines should be done. Along with it, improving the efficiency of technical staff should be done by providing advanced training skills from time to time to handle the dialysis machines properly without any blood clot cases. Scheduling of cases which increases the number of dialysis cases per day. Minimum inventory based on number of dialysis per day. Preventive maintenance needs to be scheduled for the machines to minimize any discomfort to the patient or any machine failure. Power consumption should be controlled as much as possible. Meter reading for each dialysis has to be noted in a register. So, that misuse of material & machine is properly noted.

KEYWORDS: consumption analysis, dialysis department, tertiary hospital

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I owe my gratitude to all those people who have made this dissertation possible and because of whom my post-graduate experience has been one that I will cherish forever. My deepest gratitude is to my guide, Dr.AlokMathur. I have been amazingly fortunate to have a guide who gave me the freedom to explore on my own and at the same time the guidance to recover when my steps faltered. He taught me how to question thoughts and express ideas. His patience and support helped me finish this dissertation.

My friend has helped me stay sane through these times. His support and care helped me overcome setbacks and stay focused on my study. I greatly value his friendship and I deeply appreciate his belief in me. A special thanks to Prateek Sharma.

Most importantly, none of this would have been possible without the love and patience of my family. My family, to whom this dissertation is dedicated to, has been a constant source of love, concern, support and strength through this time. I would like to express my heart-felt gratitude to my family.

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Global Hospitals, Hyderabad

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, Bangalore, 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 Paediatric Auxiliary Liver Transplant in Asia
- First Hospital in South Asia to perform Paediatric 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 is 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 doctor's 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 SaiSudhakar, 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 Laxmilavanaya
- 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 VenuGopal
- 15) Department of Nephrology and Kidney Transplant : Dr Sridhar, Dr Rama, Dr Malakondiaha
- 16) Department of Liver Transplant: Dr Venugopal, Dr.Balbir Singh , Dr Manoj, Dr Dharmesh
- 17) Department of Lab Medicine: Dr Nagraj
- 18) Department of Medical Gastroenterology: Dr KiranPeddi and team
- 19) Department of Oncology: Dr Ravi Kumar
- 20) Department of Multi Organ Transplant : Dr Sridhar
- 21) Department of Neurology : Dr GopalPaudwal
- 22) Department of Neurosurgery: Dr PravinAnkiti
- 23) Department of Orthopaedics 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 accredited 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 Haematology 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 LaxmiKiran

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 defibrillator, , Portable Ventilator, Oxygen Pump, Critical Care Medicines, Oxygen Cylinders, Stretchers etc.

- **Security:**

Global hospitals have 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.

Licensing- AERB license 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 15-21 degree C, Humidity 30-60%

Manpower – 4 Radiologists

4 technicians (Bsc. MIT, 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 & Bronchoscopy

Brain, CT abdomen, CT chest with contrast, Trifusio 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 Radiology Department.

It works on the principle of piezoelectric effect.

PNDT ACT 1994, rules 1996

Manpower- 3 nurses (shifts)

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 diluted 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 seniorconsultants

6 Associates consultant

5 Technicians

1 housekeeping

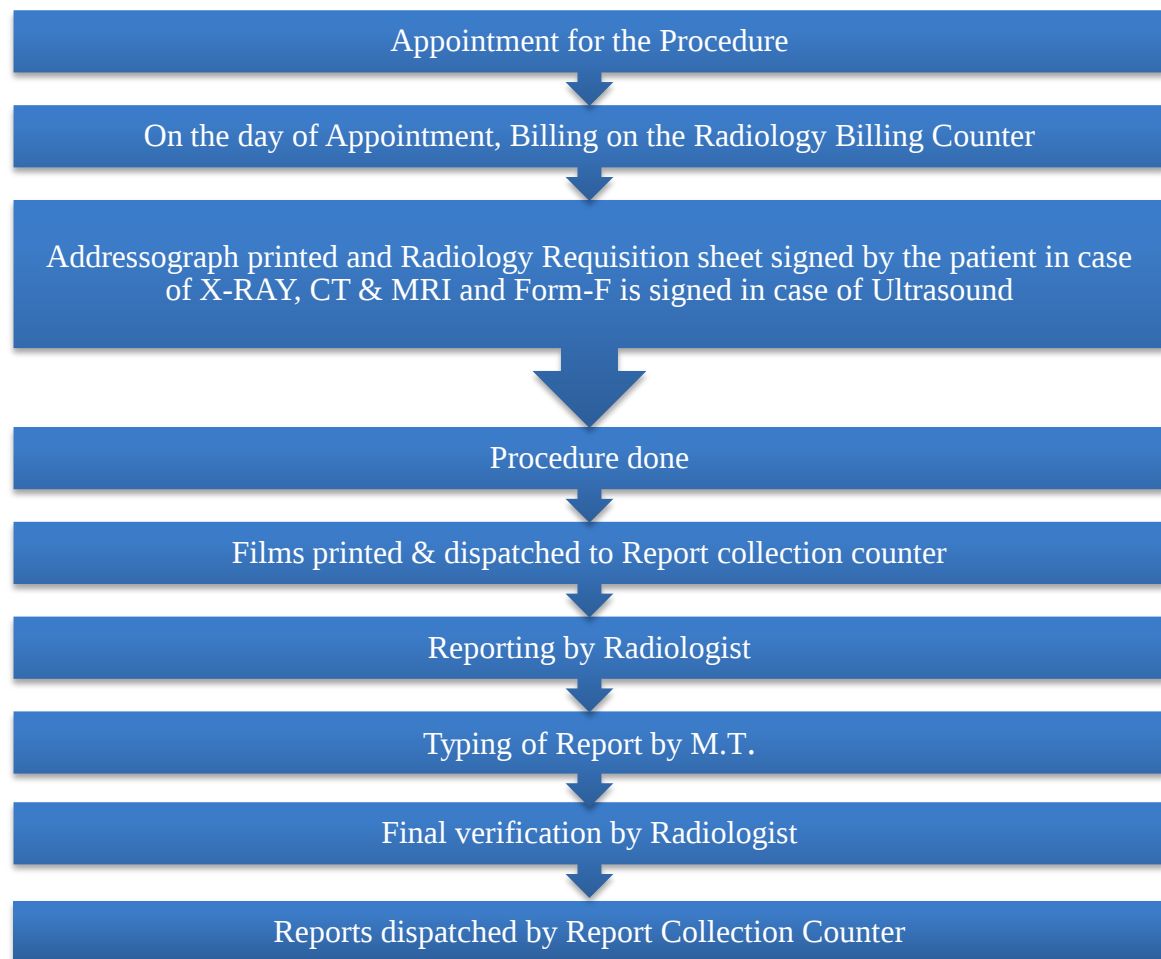


Figure 2.12.1: Process Flow in Radiology

Non- invasive Cardiology:

Procedure done:

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

Consent form require for TMT, TEE, DSE

TMT protocol

- Bruce protocol <50 yr
- Modified Bruce protocol 70-60
- 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. Consent 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 $(220 - \text{age}) \times 85\%$

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 4 operation 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 Tables Anaesthesia 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% Betadine 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.

➤ **Manpower in OT**

1. Head of Department(Anaesthesia)
 2. Anaesthetists
 3. DNB students
 4. Nursing staff (assisting surgeons)
 5. Technicians (assisting anaesthetists)
 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 Bacilloid. 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

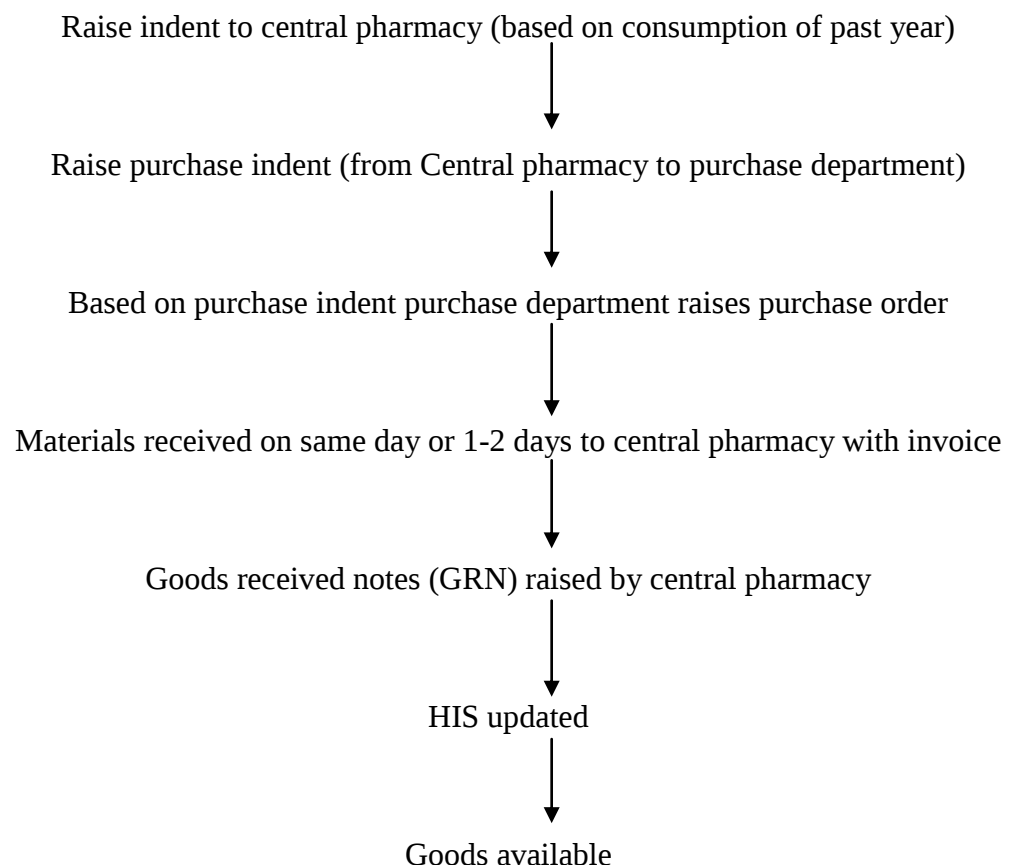
There are six pharmacy stations in Global Hospital, Hyderabad

- 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:



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 In charge
- 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, with 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



Consent 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 formalin 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

Anaesthetist

Transport boy

Emergency technician

2) Admission process flow

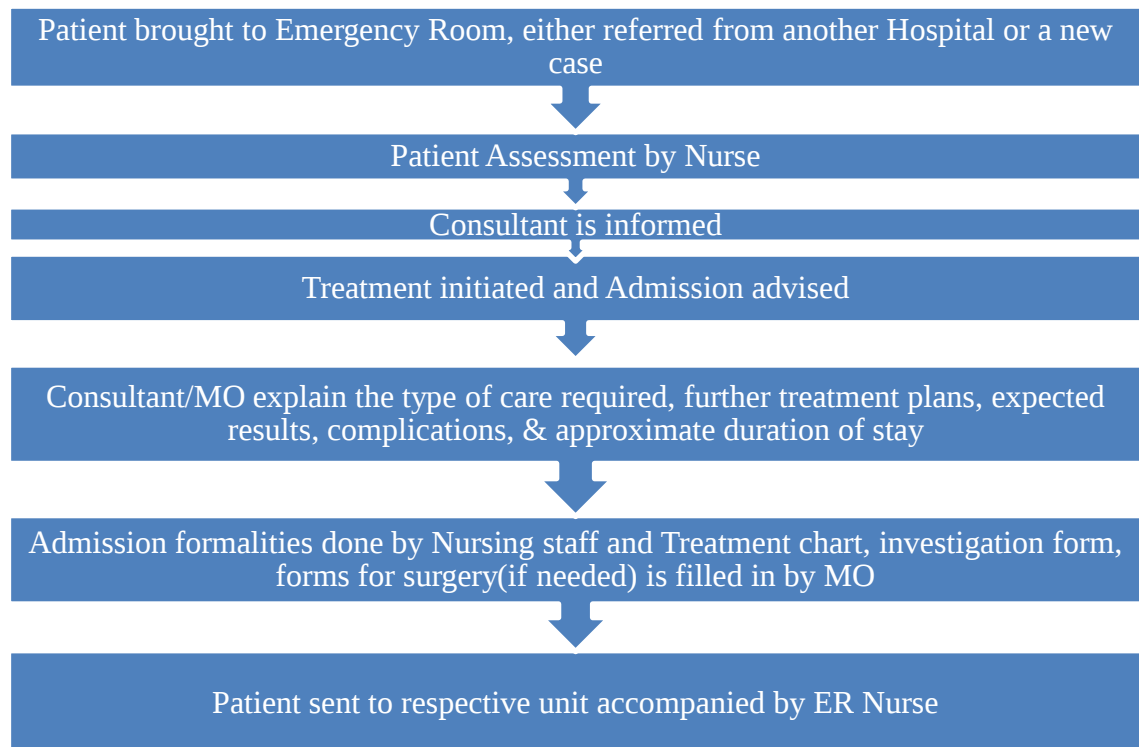


Figure 2.13.2: Process Flow showing admission process in Emergency Dept.

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 labelled 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

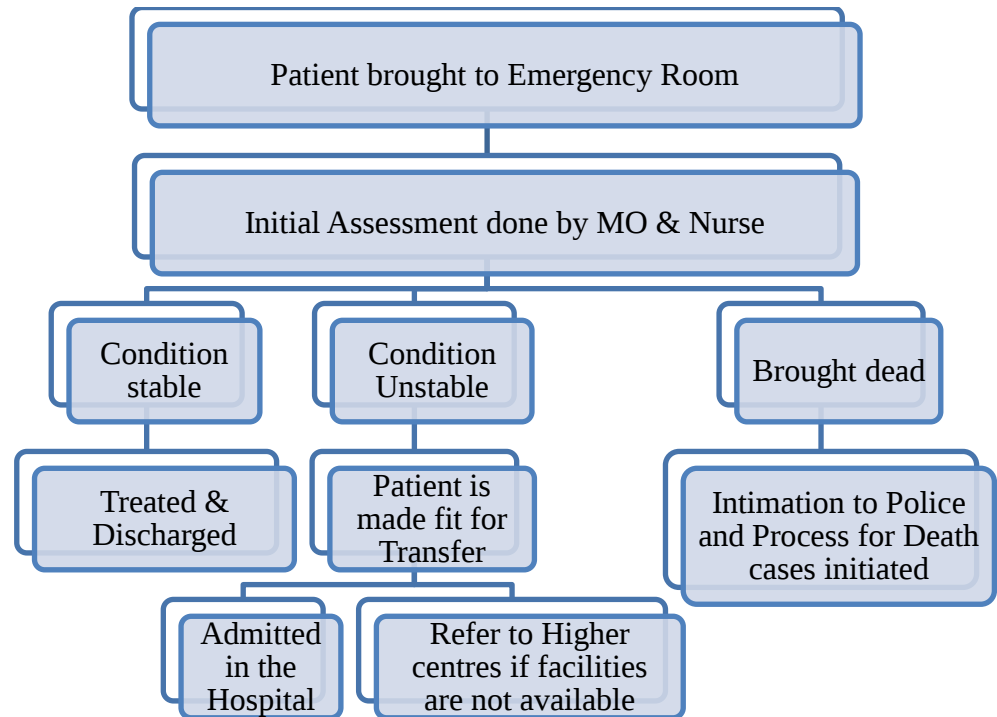


Figure 2.13.3: Process Flow in Triage

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 Ambulances:

1 small

2 big ambulances

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

HOUSEKEEPING DEPARTMENT

Outsourced department -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/Attended 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
- Sentinel events
- Accidental removal of catheters

Rationale-Departmental consumption is calculation of overall resources that are utilized to run a department in any tertiary hospital. It is important to calculate if there is any over or underutilization of resources in order to have good revenues. It increases the

revenue, decreases the holding stock, and therefore leads to proper utilizations of resources by a particular department. If each of the department performs well then it ultimately leads to an overall success of the hospital.

DIALYSIS

Dialysis means the process of removing waste products and excess fluid from the body. Dialysis is necessary when the kidneys are not able to adequately filter the blood. Dialysis allows patients with kidney failure a chance to live productive lives. There are two types of dialysis: haemodialysis and peritoneal dialysis. Patients can usually choose the type of long term dialysis that best matches their needs.

HEMODIALYSIS Types:

- Acute dialysis
- Regular dialysis
- SLED (slow low efficiency dialysis)

NEPHROLOGISTS:

- Head of the department
- Associate nephrologist
- Assistant nephrologists
- DMO

SUPPORTING STAFF:

- Technicians
- Nurses
- Housekeeping staff

DEPARTMENTAL OVERVIEW:

- 8 Machines
- RO Plant
- Place- 8*8 feet (bed space*machine space)

- 8 beds
- 3 monitors
- Store area
- Cleaning area
- Crash cart
- Stationery

RO PLANT:

Process flow:

Bore water → sand settlement → colour changes in carbon filter → softener → total dissolved salts → 0.5 micron cartridge → RO membrane through high pressure pump → rejected water → for other purposes

↓

Storage tank (5000 lts. Capacity)

↓

Through U.V light → filter (removes killed bacteria) → dialysis machine

SCOPE OF SERVICES:

- Kidney transplants
- Acute kidney injury
- Snake bite cases
- ABO incompatibility transplants
- Renal biopsy
- CRRT
- All types of renal procedures:
 - Femoral
 - Spinal lumbar catheter
 - Intra jugular catheter
 - Sub- clavian catheter

ACCESS TYPES:

- **Temporary**- created by critical care doctors
 - Jugular
 - Femoral
 - Sub- clavian

- **Permanent**- created by vascular surgeon
 - A.V. Fistula → radial, brachial
 - Graft
- Waste patient blood- through artery (red colour)
- Purified blood- through veins (blue colour)

PROCEDURE:

Pre- dialysis→

- Vitals checked by nurse
 - Blood pressure
 - Temperature
 - Pulse
 - Weight
 - Saturation
- Nephrologists' prescription
- Complications mentioned

Post dialysis→

- Vitals are checked again
- Details entered in patient's file
- Complications during dialysis
- Next appointment for dialysis

3 shifts of dialysis:

- 6 am – 10 am
- 10:30 – 3 am
- 3:30 pm – 8 pm

RE-USE POLICY:

Dialyser-

- Wash with RO water for 10 mins.
- To remove the blood clots put 3% hydrogen peroxide for 10 mins.
- Again wash with RO water for 10 min.
- Put dialyser in formalin and keep it for 10-15 mins.
- Again wash with RO water and use it after 5-6 hrs.

Blood tubings-

- Wash with RO water for 10 mins.
- To remove blood stains put sodium hypochlorite (bleach) for 10 mins.
- Wash again with RO water
- Put in formalin for 10-15 mins. And use after 5-6 hrs.

FUNCTIONS OF DIALYSER:

- Diffusion
- Osmosis
- Fluid transportation
- Electrolyte balance
- Excess fluid removal

OBJECTIVES:

- To calculate overall departmental consumption in dialysis department.
- To find out Scope for improvement.

REVIEW OF LITERATURE:

Dialysis and transplantation have become effective in prolonging the lives of patients with renal insufficiency. Conservative medical management of the patient and dialysis are the mainstay of therapy to acute renal patient¹. The incidence of chronic renal disease is growing fuelled largely by diseases associated with an aging population, hypertension and increasing rates of diabetes largely related to obesity¹. About 20% of patients with chronic renal failure are totally rehabilitated by dialysis, and another 30 to 40% of non-diabetics may be expected to be rehabilitated to functional level¹. Recording the number of kidney patients undergoing haemodialysis worldwide show that around 1.7 million patients are currently kept alive by such a therapy³. The dialysis market has seen a robust growth in the past 5 years. What makes this market more interesting and challenging is its customer base, which is relatively small yet of high value⁴. It is among the most lucrative markets in per capita terms. Indian market for dialysis equipment and consumables was valued at Rs.231 Crore in 2008⁴. As the number of people with end stage renal disease grows, the market for hemodialysis equipment and services is expected to expand, generating increased revenues throughout the forecast period⁴. Hospital costs to patients are rising to unprecedented heights, and the estimates of expenses always seem to be higher than the income generated. Users expect that hospitals should base their rates on direct patient care alone.

But this approach cannot permit the hospital to survive on a long term basis⁵. Revenues of hospitals in the voluntary sector should not only cover the traditional direct patient expenses, but must also contribute towards, providing sufficient finances to meet current obligations, covering the costs of service to indigent patients and generating funds for up gradation and expansion of existing facility⁵. Patients undergoing treatment receive services of varied nature from different departments. The hospital has to recover the expenses of the direct departments as also of the support departments from the patients availing these services⁶. The cost of providing a service becomes evident after cost finding studies. The departmental charges should be set at least to equal these costs⁵. The cost analysis is a tool which is useful in setting priorities for various courses of action to meet objectives, and provide an estimate of the net financial value associated with each course of action (e.g. manpower and labour, material and equipment, facilities)⁵. Aim: Economic evaluation of a dialysis unit using cost analysis as a tool.

METHODOLOGY:

- Time duration from 15th march to 15th April 2016.
- Prospective study
- Sample size- Dialysis department covered 432 patients

CALCULATIONS FOR CONSUMPTION ANALYSIS:

MANPOWER COST=(NO. OF TECHNICIANS*AVERAGE SALARY PER TECHNICIANS) +

(NO. OF NURSE*AVERAGE SALARY PER NURSE) +

(NO. OF HOUSEKEEPING STAFF * AVERAGE SALARY PER HOUSEKEEPING STAFF)

$$= (7*17000) + (2*12000) + (3*9000)$$

$$= \text{Rs. } 1,70,000 \text{ overall manpower cost (supporting staff)}$$

No. Of nephrologists= 5

HOD- 1, 00,000 (Fixed+ additional of 12% on acute & regular cases+ 36.36% on SLED cases) (calc. From 15th march to 15th April= Rs. 4, 80,000)

Assistant nephrologist = Rs. 1, 25,000

(DNB)Students (2) = Rs. 60000+60000

DMO = Rs. 28000

Overall manpower cost of the main staff=
480000+125000+60000+60000+28000= 753000

Overall manpower consumption (main staff+ supporting staff)
= 170000+753000= Rs. 923000

Shift timings of all staff members:

Technicians- 8:00 am – 2:00 pm (2 technicians)

2:00 pm – 8:00 pm (2 technicians)

8:00 pm – 8:00 am (1 technician)

10:30 am – 6:30 pm (1 technician) (general
shift)

Nurse- 8:00 am – 4:30 pm (1 nurse)

12:00 pm – 8:30 pm (1 nurse)

ELECTRICITY CONSUMPTION=

Machines – 8 (in no.)

1 machine = 4 hrs. = 4 units electricity consumption+ 1.6 Units for disinfection

Consumption per machine = 5.6 units

Consumption for 8 machines= $5.6 \times 8 = 44.8$

17×5.6 (avg. Dialysis per day) = $95.2 \text{ units} \times 31$

= $2951.2 \text{ units} = 2951.2 \times 8 \text{rs.} = \text{Rs. } 23610$

tube lights – 18 (36 watts)

Average usage hours per day=14 hrs.

Approx. Units per month= 273 units

CFL bulb – 28 (11 watts)

Average usage hours per day=14 hrs.

Approx. Units per month= 138 units

Air conditioner – 1 (15 tons)average usage hours per day=14hr

Approx. Units per month= 22075 units

Total electricity consumption= 1 unit = Rs. 8 (industrial rate)

$25,437.2 \text{ units} = \text{Rs. } 2, 03,498$

WATER CONSUMPTION:

-AVERAGE WATER CONSUMED IN ACUTE & REGULAR= 150 Lt.

-AVERAGE WATER CONSUMED IN SLED= 180 Lt.

-COST OF 1 Lt. WATER = .25 Rs(avg. Commercial rate)

(During my observation period i.e. from 15th march to 15th April, 2016):

No. Of patients for acute & regular =392

No. Of patients for SLED = 40

WATER CONSUMPTION= (Cost of water consumption for ACUTE®ULAR) + (Cost of water consumption for SLED)

= no. Of patients for acute & regular* avg. Water used per patient*cost of 1 lt. Water

= no. Of patients for sled *avg. Water used per patient*cost of 1 lt. Water

= (392*150*0.25) + (40*180*0.25)

= 14700+1800=**Rs.16500**

DATA ANALYSIS:

Flow process of activities of dialysis department:

Study was conducted in the following manner to address these study objectives:

The observation period was from 15th march to 15th April, 2016

- The patient flow during the observation period was recorded for all 3 types of dialysis.
- The manpower cost was calculated which included the salaries of the main staff and the supporting staff.
- Material cost along with its consumption per patient was calculated.
- Electricity consumption and its cost to the hospital was calculated for the observation period.
- Water consumption and its cost per patient and to the hospital was calculated.
- Overall cost of the dialysis departmental consumption was calculated.

CONCLUSION & SUGGESTIONS:

- Optimum utilization of manpower & machines.
- Improving the efficiency of technical staff by providing advanced training skills from time to time.
- Scheduling of dialysis timings which improves no. Of dialysis cases per day.
- Minimum stock (inventory) holding based on no. Of dialysis per day.
- Preventive maintenance to be scheduled for the machines.
- Power consumption should be controlled as much as possible.
- Metre reading for each dialysis to be maintained. So, that misuse of material & machine is properly noted.

REFERENCE

Ashwini Nayak S, L. A. (2012). *Cost Analysis of Dialysis Unit at a Tertiary Care Multi Speciality Teaching hospital*. Mangalore: JIMSA.