

**Summer Training at  
Narayana Multispecialty Hospital,  
Jaipur**

**Admission Discharge and Transfer (ADT) Focus on Reducing Average Length  
Of Stay (ALOS) At Narayana Multispecialty Hospital, Jaipur**

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**Under the guidance of  
Dr. Nirmal Kumar Gurbani**

**MBA Hospital and Health Management  
2015-2017**



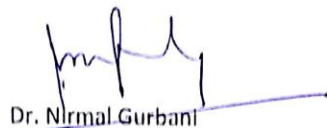
**The IIHMR University, Jaipur  
2016**

## CERTIFICATE

This is to certify that Dr. Ankita Mandwe has undergone Summer Training in Narayana Hospital, Jaipur from 1<sup>st</sup> April 2016 to 31<sup>st</sup> May 2016.

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

I wish her success in all her future endeavors.



Dr. Nirmal Gurbani  
Professor

IIHMR, Jaipur



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Dean (Academic & Student Affairs)

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Date: 1<sup>st</sup> June 2016

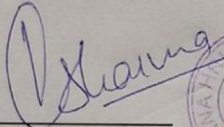
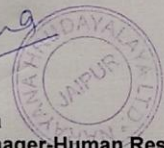
TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Ms. Ankita Mandwe** has completed her summer internship training in Operations on "Admission, Discharge and Transfer(ADT) Focus on reducing Average length of Stay(ALOS)" Successfully in Narayana Multispecialty Hospital, Jaipur from 1<sup>st</sup> April 2016 to 31<sup>st</sup> May 2016.

Her work during the Period was commendable and appreciable. Her character and conduct was good.

We wish her success in her future endeavors.

For Narayana Multispecialty Hospital, Jaipur

  
  
**Vishnupriya Sharma**  
Deputy General Manager-Human Resources



## **PREFACE**

Summer internship is an integral part of MBA-HM curriculum. As a part of the course, the students of first year are required to undergo summer placement at any reputed organization to get in depth exposure to various departments of the organization and understanding of health care delivery system and its functions.

The major objectives of the summer internship are as follows:

1. To understand and learn day to day operational management of a Hospital/ Health Care organization and its service contents.
2. To identify issues/problems with certain operational areas.
3. To acquire more knowledge on roles and responsibilities of key players and stakeholders in the hospital.
4. To gain perspective in the functions of various departments by interaction with key stakeholders, policy makers, academicians and researchers.
5. To work on a Project assigned by the summer training organization.

## **ACKNOWLEDGEMENT**

The internship opportunity we had with Narayana Multispeciality Hospitals, Jaipur was a great chance for learning and professional development.

I feel deeply privileged in expressing our deep sense of gratitude to Mr.Arunesh Punetha (Facility Director) and Dr. Mala Airun (Clinical Director) Narayana Multispeciality Hospital , Jaipur for their expert guidance and encouragements which helped in the process of making this report. Without their support, exploring such a vast organisation could not have been possible.

I would like to express my deepest gratitude to Mr. Subhasis Bhattacharya(Deputy GM Operations), who guided me and gave me the project and helped me throughout the work.

I am also grateful to all the department heads and staff for giving me time in spite of their hectic schedule. Without their active co-operation and participation it would not have been possible to accomplish my task.

My sincere gratitude to my mentor Dr. Nirmal Gurbani(Professor in IIHMR), for his constant encouragement.

Sincerely

Dr. Ankita Mandwe

**LIST OF ACRCRONYMS/ABBREVIATIONS:**

ADT: Admission, Discharge and Transfer

ALOS: Average Length Of Stay

ANC: Antenatal Care

ARPOB: Average Revenue Per Occupied Bed

BLS: Basic Life Support System

BOR: Bed Occupancy Rate

CABG: Coronary Artery Bypass Grafting Surgery

CCU: Cardiac Care Unit

CSSD: Central Sterile Services Department

CTVS: Cardio-Thoracic Vascular Surgery

EDOS: Expected Days of Stay

IFT: Interferential Therapy

MICU: Medical Intensive Care Unit

MLC: Medico-Legal Cases

PAC: Pre-Anesthetic Check-up

PICU: Pediatric Intensive Care Unit

PTCA: Percutaneous Transluminal Coronary Angioplasty

SWD: Short Wave Diathermy

TAT: Turn Around Time

TENZ: Transcutaneous Electrical Nerve Stimulation

TPA: Third Party Agreement

## **CONTENT**

| <b>Sr.no</b> | <b>Topic</b>                                                                                                                                                                                                                                                                               | <b>Page No.</b> |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| 1            | Organisational Profile Of Narayana Multispecialty Hospital                                                                                                                                                                                                                                 | 07 - 21         |
| 2            | Intoduction Of Project -<br>Admission, Discharge And Transfer (ADT)<br>Focus On Reducing The Average Length Of Stay (ALOS)<br><br><ul style="list-style-type: none"> <li>• ALOS And Business Impact</li> <li>• Definition And Terms Used</li> </ul>                                        | 22 -24          |
| 3            | Problem Statement                                                                                                                                                                                                                                                                          | 24              |
| 4            | Review Of Literature                                                                                                                                                                                                                                                                       | 24 - 26         |
| 5            | <ul style="list-style-type: none"> <li>• Rationale</li> <li>• Aim</li> <li>• Objectives</li> </ul>                                                                                                                                                                                         | 26              |
| 6            | Process Mapping                                                                                                                                                                                                                                                                            | 27              |
| 7            | Methodology And Study Design<br><ul style="list-style-type: none"> <li>• Methodolgy</li> <li>• Sampling Tecnique</li> <li>• Sampling Size</li> <li>• Data Collection Method</li> </ul>                                                                                                     | 28 - 30         |
| 8            | Data Interpretation And Analysis Of Alos:<br><ul style="list-style-type: none"> <li>• Fish Bone Analysis</li> <li>• Major Reason Behind Prolonged Stay Of Patients</li> <li>• Analysis Of Different Reasons Contributing Towards The Prolonged Stay Of Patients In The Hospital</li> </ul> | 30-31           |

|    |                                                                                                                                                                                  |         |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 9  | Discussion:<br>Factors Resulting In Prolonged Stay: <ul style="list-style-type: none"><li>• Treatment</li><li>• Management</li><li>• Investigations</li><li>• Patients</li></ul> | 31 - 34 |
| 10 | Recommendations                                                                                                                                                                  | 34      |
| 11 | Limitations                                                                                                                                                                      | 35      |
| 12 | Conclusion                                                                                                                                                                       | 36      |
| 13 | References                                                                                                                                                                       | 36      |

## **1. ORGANISATIONAL PROFILE**

Narayana Multispecialty Hospital, a branch of Narayana Health (Head Quartered in Bengaluru, India), a privately owned hospital in Jaipur, estd in 2010, is a perfect blend of technological excellence, complete infrastructure, competent care and heartfelt hospitality - this is how the people, whom the hospital has been fortunate to serve, define the hospital.

It is a 290 bedded multispecialty tertiary care hospital, located at Pratap Nagar within a sprawling campus of 4.7 acres offering high quality affordable medical care to the people within Rajasthan and bordering states as well.

Narayana Multispecialty Hospital, Jaipur was awarded the International accreditation from **Joint Commission International (JCI)** on 21<sup>st</sup> July 2012, making it the first hospital in Rajasthan to receive this prestigious recognition. It got reaccredited from JCI in 2015. A JCI accreditation provides assurance that the standards, training and processes at the hospital meet the highest international benchmarks.

**1.1 Vision:** "Our vision is affordable quality healthcare to the masses worldwide."

**1.2 Mission:** "To deliver high quality and affordable healthcare services to the broader population by leveraging our economies of scale, skilled doctors, and an efficient business model".

**1.3 Values:** Core values are represented by the simple acronyms **iCARE**

- i- Innovation & efficiency  
To continuously reduce the cost of delivery of high quality health care and improve our reach.
- C- Compassionate care  
In providing accessible service that makes a difference to our patients.
- A- Accountability  
To honour commitments to our patients, employees and investors with integrity and transparency.
- R- Respect for all

Recognise the contribution of every employee and respect the rights as well as the dignity of every patient and employee.

- E- Excellence as a culture

Where we individual excel to collectively ensure the highest quality of consistence and reliable services to our patients and sustainable values to all our stakeholders.

#### **1.4 The ultimate goal of NH : Service Excellence**

Patient satisfaction

#### **1.4 Scope of Services:**

- Anaesthesia & Critical Care
- Department of Cardiac Science
  - Minimally Invasive Cardiology
  - Cardiac Electrophysiology
  - Paediatric Cardiology
  - PTCA
  - Coronary Angiography
  - Cardiothoracic & Vascular Surgery
- Paediatric & Adult
- Department of ENT
- Department of Gastrointestinal Sciences
  - Medical Gastroenterology & Haematology
  - G.I & Laparoscopic Surgery
  - Bariatric Surgery
- Department of Neuro Sciences
  - Neurology
  - Neurosurgery
- Department of Paediatric
  - Neonatology
  - Paediatric
- Department of Paediatric Surgery

- Department of Renal Sciences
  - Dialysis
  - Nephrology
  - Urology
  - Transplant Services
- General & Laparoscopic Surgery
- Institute of Bone, Joint & Spine
  - Hand & Microvascular Surgery
  - Joint Replacement
  - Spine surgery
  - Sports Medicine & Arthroscopy
- Internal Medicine
- Obstetric & Gynaecology
- Pulmonary Medicine
- Department of Rheumatology
- Onco-Gynaecology
- Ophthalmology
- Dermatology
  
- ALLIED SERVICES
  - Dietetics
  - Emergency & Trauma
  - Radiology & Imaging
  - 1.5 Tesla MRI
  - 64 Slice CT Scan
  - Cath lab
  - Laboratory Sciences
  - Physiotherapy

## **1.5 DEPARTMENTAL SERVICES:**

### **1. Outpatient Department:**

There are 4 decentralised OPD :

1. North OOD
2. South OPD
3. Cardiac OPD
4. Nephrology OPD

OPD Timings: 9am to 5pm.

Average no. of OPD patients 300-350 per day ( Including old and new patients).

### **2. In Patient Department:**

- Male Medical Ward:  
Location: Lower ground floor.  
Bed Capacity: 19 Beds
- Male Surgical ward:  
Location: Lower ground floor  
Bed Capacity: 16 Beds
- CCU  
Location: Ground floor  
Bed Capacity: 20Beds
- MICU  
Location: Ground floor  
Bed Capacity: 20 Beds including 2 bed 0063s for isolation
- Female Medical & Surgical ward  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 36 (18+18) Beds
- ANC Ward  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 8 Beds with 2 Beds in Labour Room

- Paediatric Ward  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 5 Beds
- PICU  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 5 Beds
- NICU  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 6 Cribs
- ITU  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 21 beds plus 2 beds for isolation
- Semi Private Ward  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 36 Beds including 4 day care beds.
- KTU  
Location: 1<sup>st</sup> Floor  
Bed Capacity: 3 Beds
- Private Ward  
Location: 2<sup>nd</sup> Floor  
Bed Capacity: 18 Beds
- CTVS Male & Female Ward  
Location : 2<sup>nd</sup> Floor  
Bed Capacity: 23 Beds
- Ortho General Ward  
Location: 2<sup>nd</sup> Floor  
Bed Capacity: 6 Beds
- Neuro General Ward  
Location: 2<sup>nd</sup> Floor  
Bed Capacity: 6 Beds

### **3. Emergency Services:**

Location: Lower ground floor

Entrance : Separate entry from the main road.

The Emergency Department is a well equipped 10 bedded department. 3 beds for each triage category Red , Yellow, Green and 1 bed for isolation.

Staff: 1 Emergency Incharge, 2 MO , 1 Nursing Incharge, 9 Staff nurse, 2 House-Keeping staff.

Ambulance service is outsourced.

### **4. Operation Theatre:**

There are 5 functional OTs in the 1<sup>st</sup> floor and 4 functional OTs in the 2<sup>nd</sup> floor out of total 11 OTs

Location: 1<sup>st</sup> and 2<sup>nd</sup> Floor

Easy access to CCU, Blood Bank, Emergency and CSSD

ITU is attached to the the OTs located in the 1<sup>st</sup> floor

Manpower: 1 Chief Head of the Department, 21 Anaesthetists, 1 OT Manager, 3 Perfusionists, 21 OT Technicians, 52 Staff Nurse, 5 House Keeping Staff.

No of Surgeries: 480-500 surgeries per month with around 150 cardiac surgeries every month.

### **5. Catheterisation Lab:**

Location : Ground Floor

All Invasive Procedures are done in cath lab such as Angiography, Angioplasty , Cath Study, Electro Physiological Study.

Door to Balloon Time for emergency patients is 90 minutes.

Average patients – 10-12/day

Temperature: 17-20 degree Celsius.

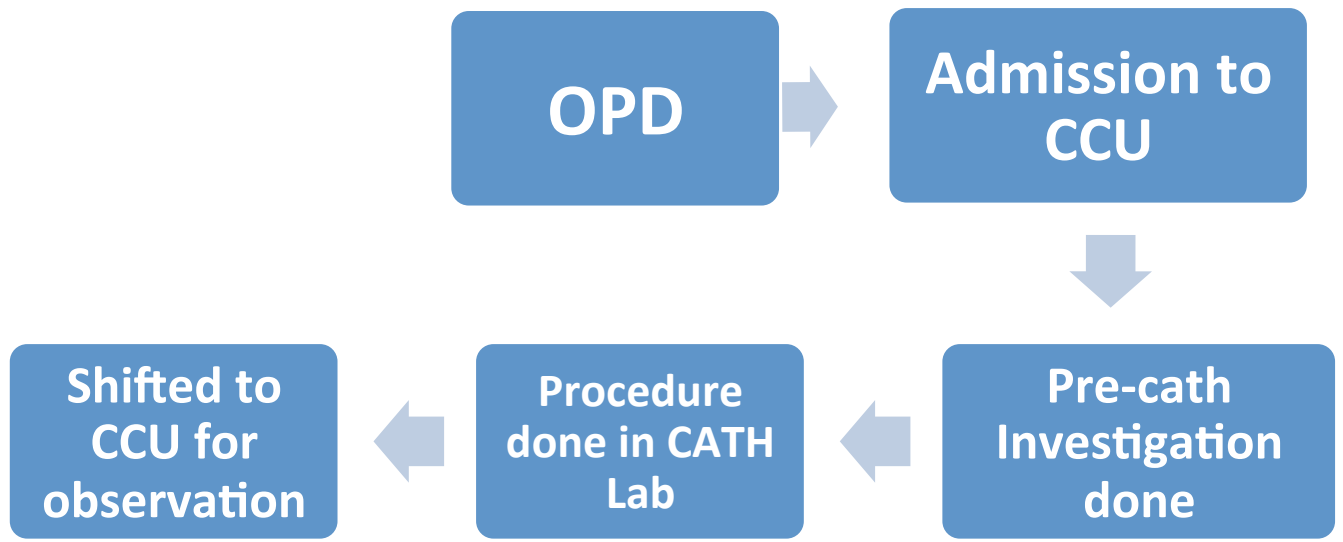
TAT: In between 2 cases: 45-50 mins

Angiography : 10-15 mins

Angioplasty: variable

Maintenance is done regularly every 3 months.

**Process Flow:**



**6. CSSD**

Location: Lower Ground Floor

Total Area is divided into 4 Zones:

- Zone I. (Dirty Utility) Reception , Inspection and Documentation
- Zone II. ( Clean Area) Assembly and Packing
- Zone III ( Sterile Area) Sterilisation
- Zone IV (Issue Area) Storage and distribution

Check for proper sterilisation

- Bowie dick test
- Leak test
- Sterilisation test
- Batch monitoring test

**7. Radiology Department:**

Location: Lower Ground Floor

Area:

- Reception Area
- Console Room

- Imaging service room
- Changing room-2

Different rooms for X-Ray, Mammography, MRI, CT Scan.

## **8. Laboratory:**

Location: Ground floor

All laboratory services related to Biochemistry, Microbiology, Histopathology and Haematology.

Blood Bank is attached with the laboratory.

## **9. Physiotherapy and Rehabilitation Centre:**

Location: Lower ground floor

Well trained team of 6 physiotherapist managing the department and providing rehabilitation therapy for joint disease, strokes, trauma etc.

Other facilities :

- Wax Therapy
- Hydro collator- hot pack
- Interferential Therapy
- IFT- Pain Relief
- Ultrasound therapy- piezoelectric effect
- TENS
- Muscle Stimulator
- SWD etc

## **10. Medical Record Department:**

Scope of Services:

- Maintenance of all medical record
- Storage of records : 1) OPD: 3 years  
2) IPD: 5 years  
3) Death/MLCs: lifetime
- Maintaining the integrity and confidentiality of all medical record
- Maintenance of MLC cases
- Numbering and filing
- Completion of all incomplete records.
- Arrangement is according to Admission No.

## **11. Food and Beverages:**

Location: Lower ground floor

Scope of services:

- To provide well balance nutritious food to all in patients as well as patients for dialysis as per their needs.
- To serve staff and patients attendants
- To helps in improving the patients condition by providing hygienic , proper and nutritious food as prescribed by the dieticians.

Provide 5 servings for the general ward patients and 8 servings to the semi private and private ward patients.

Types of diet:

- Normal full diet
- Liquid diet
- Soft diet
- Diet for diabetic patients
- Diet for renal patients
- Diet post cardiac surgery patients.

## **12. Housekeeping:**

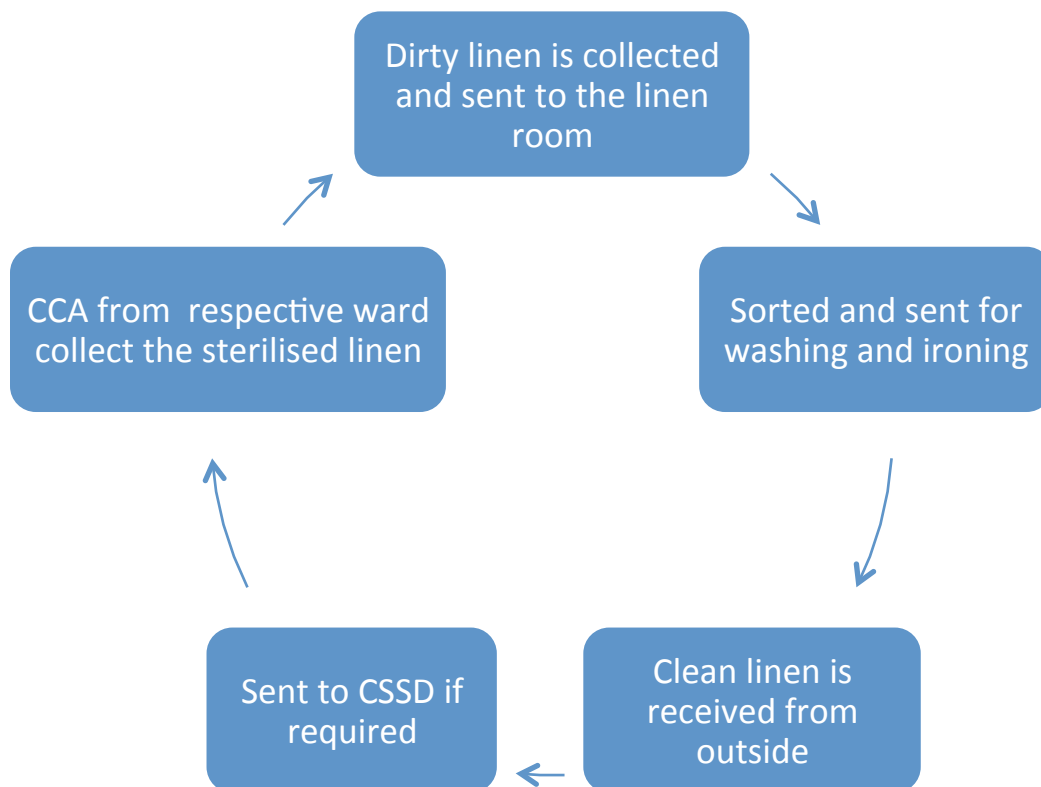
Housekeeping department is outsourced

Services provide:

- Maintain hygiene of the patients and the hospital
- Helping in patients preparation
- Infection control
- Waste disposal

## **13. Linen and Laundry:**

Linen and laundry department is outsourced



Availability of coloured coded bags in each department. Orange colour is for serology positive patients and and green bags for serology negative patients.

## **14. Pharmacy:**

The hospital different types of pharmacy:

- OPD Pharmacy
- IPD Pharmacy
- OT Pharmacy

Functions:

Dispensing of drugs to all the admitted patients.

Dispensing of drugs for the OPD patients.

Demand estimation according to the formulary, in the absence of formulary, establishment of specification for drug procurement

Furnishing of new drug information to consultants and other professional staff

Quality control of drugs purchased

## **15. Diagnostic Services:**

Location: Ground Floor

Scope of services:

- Ultrasonography
- TMT
- Electrocardiography
- Echocardiography
- Electroencephalography
- Uroflowmetry
- Electromyography
- Pulmonary function test

Operational timings: 9 am to 5 pm.

### **16. Dialysis Department:**

Location: Lower ground floor

Machines: 30

Bed Capacity: 20 beds including 4 beds for serology positive patients

No. of procedures done per day: 55-60 dialyses per day

Manpower: 10 staff nurse, 7 Technicians, 2 MO, 4 HK

TAT: 15 mins Pre, 4 hrs Dialysis, 15 mins Post

Shift of dialysis: 7 am to 12 noon, 12 noon to 5 pm and 5pm to 8 pm.

Every patient is provided with a meal, included in tariff and the meal is prescribed by the dietician.

### **17. Mortuary:**

Location: Lower ground floor

Temperature: 5-6 degree Celsius

Capacity: At a time four dead bodies can be kept together

Functions:

- To keep the dead bodies in the hospital until the relatives claim them.
- To keep the dead bodies for post mortem ( MLC Cases).

### **18. Security Services:**

Security service department of the hospital is outsourced.

Functions:

- To provide security services to all the staff, patients, relatives and visitors
- To protect the hospital property within the premises
- To analyse threats and vulnerability in conjugation with the managements , police and others
- To control the movement of vehicular traffic inside the premises.

• **19. Billing and Finance Department:**

Location: Ground floor

Operational timings: 9am to 5 pm for the finance department

24 hr IP billing service.

Functions:

- To provide salary to all the staff in a timely manner
- To provide payment to all the vendors and contractors
- Tracking the expenses of in patients on daily basis
- Timely discharge of patients related to financial clearance
- To provide accurate and timely financial information for decision making.

**20. Maintenance Department:**

Location: Lower ground floor

Functions:

- To maintain continuous electric supply to the hospital.
- To maintain the chilling plant room of the hospital
- To maintain the supply of medical gases
- To maintain the proper functioning of STP

Operational timings: 24hr.

Infrastructure:

Low tension room

Generator panel: 2 generator of 750 KVA each

Diesel tank- 24 kilolitres capacity

Sewerage treatment plan

Desk panel- control air handling unit

Chilling plant room – 2 nos each 350TR

Gas manifold room :

| Sr No. | Types of Gases  | Types of cylinders | Pressure/Weight      | Cylinder (Color Code)             | Pipeline (Color Code)              |
|--------|-----------------|--------------------|----------------------|-----------------------------------|------------------------------------|
| 1      | Oxygen          | A/B/D              | 110-125 kg/sqcm      | Black with white neck             | Yellow with white band             |
| 2      | Nitrous Oxide   | D/A                | 40-50 kg/sqcm        | French blue                       | Yellow with blue band              |
| 3      | Carbon Dioxide  | A/D                | 2/30 kg              | Black with white band & grey neck |                                    |
| 4      | Compressed air  |                    | 1500 litres capacity |                                   | Light blue with white & black band |
| 5      | Vacuum station  |                    | 3000 litres capacity |                                   | Light blue with black band         |
| 6      | Air dryer       |                    | 45 CFM capacity      |                                   |                                    |
| 7      | Bacteria Filter |                    | 45 CFM capacity      |                                   |                                    |

## **21. Human Resource Department:**

Location: First floor, Admin Block

Functions:

- Recruitment based on requisition form from respective department duly signed by incharge of the department, HR and facility director
- Induction and training programs- 3 days induction program for all new employees
- Performance appraisal ones in a year in the month of March
- Employee engagement activities such as birthday celebration, open house, and also on the job trainings such as fire safety. BLS training
- Grievance Handling
- Conduct employee exit interview

## **22. Fire safety Department:**

Location: Lower ground floor

The hospital has 7 fire exist door in each floor . A total 26 functional fire exist doors

Sprinklers are located in the entire hospital with a distance of 6 mts between two sprinklers and burst at 68 degree Celsius

Smokes detectors are also located in the entire hospital.

Fire Safety Equipments:

- Horse Reel Drums                      21
- Jockey Pump                              01
- Alarm Valve                               05
- Double Hydrant Valve                28

Hospital follows “PASS” and “ RACE” protocols.

PASS: Pull Aim Squeeze Sweep for operating a fire extinguisher

RACE: Rescue Alarm Contain Extinguish, Evacuate.

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# **PROJECT REPORT**

## **Admission, Discharge and Transfer (ADT)**

### **Focus on reducing the Average Length of Stay (ALOS)**

#### **INTRODUCTION**

Hospital Length of stay is considered to be a reliable and valid proxy for measuring the consumption of hospital resources. Average length of stay, however, albeit easy to quantify and calculate, does not suitably reflect the nature of such underlying distributions and may therefore mask the effect that the different streams of patients have in the system. The LOS not only reflect changes in the service provided by the hospital but also provide necessary data on seasonal variations.

Basically hospital length of stay for an individual patient considered as the total number of patient days for an inpatient episode. The duration of an in-patient's hospitalization is considered to be one day if he is admitted and discharged on the same day, and also if he is admitted on one day and discharge the next day. Total length of stay (total discharge days) is the number of days of care rendered to a group of in-patients from admission to discharge. The sum of the length of stay of any group of inpatients discharged during a specified period of time. Physicians exert ultimate control over the way in which treatment procedures are used and the subsequent length of stay of patients. Diagnosis and treatment procedures for the same cause of admission vary among physicians of the same department.

This project uses routinely collected data from the wards of Narayana Hrudalaya Hospital on in-patients who admitted in hospital for various procedures, who were discharged from NH Hospitals for the period of five weeks from 20<sup>th</sup> April, 2016 to 20<sup>th</sup> May, 2016. This will be the basis for a running example illustrating the alternative methods of analysis and models of patients length of stay.

Any hospitals length of stay mainly depends on the following determinants:

1. Case mix
2. Diagnosis related group

3. Disease staging
4. Pre-procedure LOS
5. Post-procedure LOS

- **ALOS and Business Impact**

Hospital length of stay is inversely proportional with revenue making because if the length of stay is high then obviously bed turnover rate would be low which will lead to low revenue generation. In context of NH Hospital it seems very realistic because as it is a multispecialty hospital with a variety of case mix in the hospital and has a fixed protocol and package system, if against the protocol a single patient's stays is exceeding then this will become liability for hospital because in that mean time hospital would like to perform yet another procedures to maximize the utilization of its resources.

Apart from bed turnover rate it also results as high bed occupancy and low satisfaction because high length of stay translates into a reduction in effective bed capacity and admission process delays. Admission bed demands sometimes exceeds capacity, leading to delays in patient admission. Bed occupancy is not the index for the efficiency of the hospital but have significant and quantifiable negative influence on the emergency department affecting both the patients who are hospitalized and the patients who are waiting for the admission.

- **Definition and terms used:**

While conducting the study we need to be familiar with the following terminology which are commonly used in the hospitals and are required for the understanding process.

1. **Bed occupancy:**

The ratio of inpatient service days to bed count days in the period under consideration. The inpatient census represents the actual occupancy (Number of Occurrences). The bed count represents the possibility for occupancy (Number of times it could have occurred or maximum possible). It has found that the patients with shorter stays are more satisfied with their experience than those with longer hospital stays. The study identifies four areas that contribute to patient satisfaction with the discharge process.

Patient readiness to leave the hospital, and efficient, swift patient discharge process, clear instructions for care after discharge, coordination of arrangements following discharge so that the patient has all the support and equipment necessary.

**2. Bed turnover rate:**

The number of times a bed, on average, changes occupants during a given period of time. The average no. of admissions per bed per time period useful because two time periods may have the same percentage of occupancy, but the turnover rates may be different.

**3. Key personnel:**

Senior doctors, junior doctors, nurses, discharge secretary, billing department, insurance company, and patients.

## **PROBLEM STATEMENT**

Hospital administrators and financial managers strive to achieve high bed turnover rate, because the unpredictability of illness and injury requires that bed should be available if possible at all times. But high length of stay leads to low bed turnover which ultimately results in high bed occupancy and long waiting list for admission. The hospital administration wants to convert this problem of high bed occupancy in the hospital to optimum bed occupancy as well as to provide the quality of patient care to those in need of it at the earliest possible.

## **REVIEW OF LITERATURE**

Hospital length of stay is an important performance indicator for hospital management and a key measure of efficiency in health care. Reduction of LOS of a patient and predicting the LOS in the hospital will help the hospital administration. Hence, hospitals can improve their quality of service to the patients with the available resources which in turn improves the patient's satisfaction level and reduction in the cost.

A study from Academy Health Meeting examined patient-level factors versus facility-level factors impacting residential length of stay of youth with mental health, substance used, and co-occurring disorders. This study also included a methodology for identifying facilities whose patients on average had a marked short or long length of stay. Using a cross-classified structure/model (patients receiving care during multiple facilities during the study time period), they estimated LOS with the following co-variants; Patient characteristics-age, gender, race, insurance, and diagnosis upon admission. Facility characteristics were facility type and primary

specialty. Their findings suggest only 8% of the variation in length of stay was explained by variables at the patient-level versus 47% being explained at the facility level. They further suggest the importance of monitoring facility processes and outcomes.[1]

Patients who are managed proactively by a multidisciplinary team (particularly patient with complex needs or the frail elderly) do better than those cared for in a traditional way and so would be less likely to have a protracted length of stay. The number of unnecessary days in a hospital stay can be reduced through twice-daily multidisciplinary rounds and decision-making.[2]

Effective discharge planning and timely transfers of care can reduce length of hospital stays and reduce readmissions. Establishing *discharge coordinators* to progress transfers and establish positive working relationships with health and social care partners across the week has been found to be effective in improving patient flow in case study hospitals.[3]

A study on Influence of prolonged hospitalization on overall bed occupancy found that the average mean age of those admitted was 56.8 years. There was a significant increase in the average age as the length of hospitalization was prolonged, from 54.2 years for those staying <10 days to 77.6 years in those with prolonged stay of 41 days. Women were at increased risk of very prolonged stay compared with men. The risk of a long stay admission was significantly increased in patients with stroke, kidney disease, fracture, dementia or degenerative neurological disease.

The Author concludes that improving efficiency and productivity within the NHS is an important goal. Much recent policy is directed at reducing hospital length of stay and acute admissions in an effort to optimize the use of beds.[4]

One strategy to reduce waiting list is to optimize the patient length of stay. One of the major ways of reducing wait lists is by freeing up resources. Patients who no longer need treatment should be discharged. Hospital management and medical staff must ensure that patients receive the best possible care, however it is vital to discharge patients who can no longer benefit from healthcare services in order to provide the same high quality care to others in need.

It was concluded that by introducing new roles, new policies and new low level tools to the 7 West team, it is possible to help optimize patient length of stay.[5]

On the basis of data collected from all the hospitals of Canada from 1995-2005 it was found that the study was conducted to identify the relation of age standardization and acute inpatient's with average length of stay. From the study it was obtained that patients who came from emergency consume 61% of total hospital days and patients' in the age group 60+ consumes more than 58% of total hospital days.[6]

Another study cites reduction in cost per case and LOS due to: no delays of treatment after admissions, volume based experience of hospitalists enhance diagnostic speed, facilitating earlier start of treatment, vigilant attention to changes to patient condition on 24x7 basis, minimum patient down time in waiting for care, testing, results or consults, continuous fine tuning of therapeutics, ready availability of hospitalist to patient/family improves communication, greater confidence in earlier discharge from ICU, recovery room, discharge planning begins in admission.[6]

## **RATIONALE**

- High length of stay cause long waiting list for admission.
- Available hospital policies to cater the length of stay are good but need some modifications.

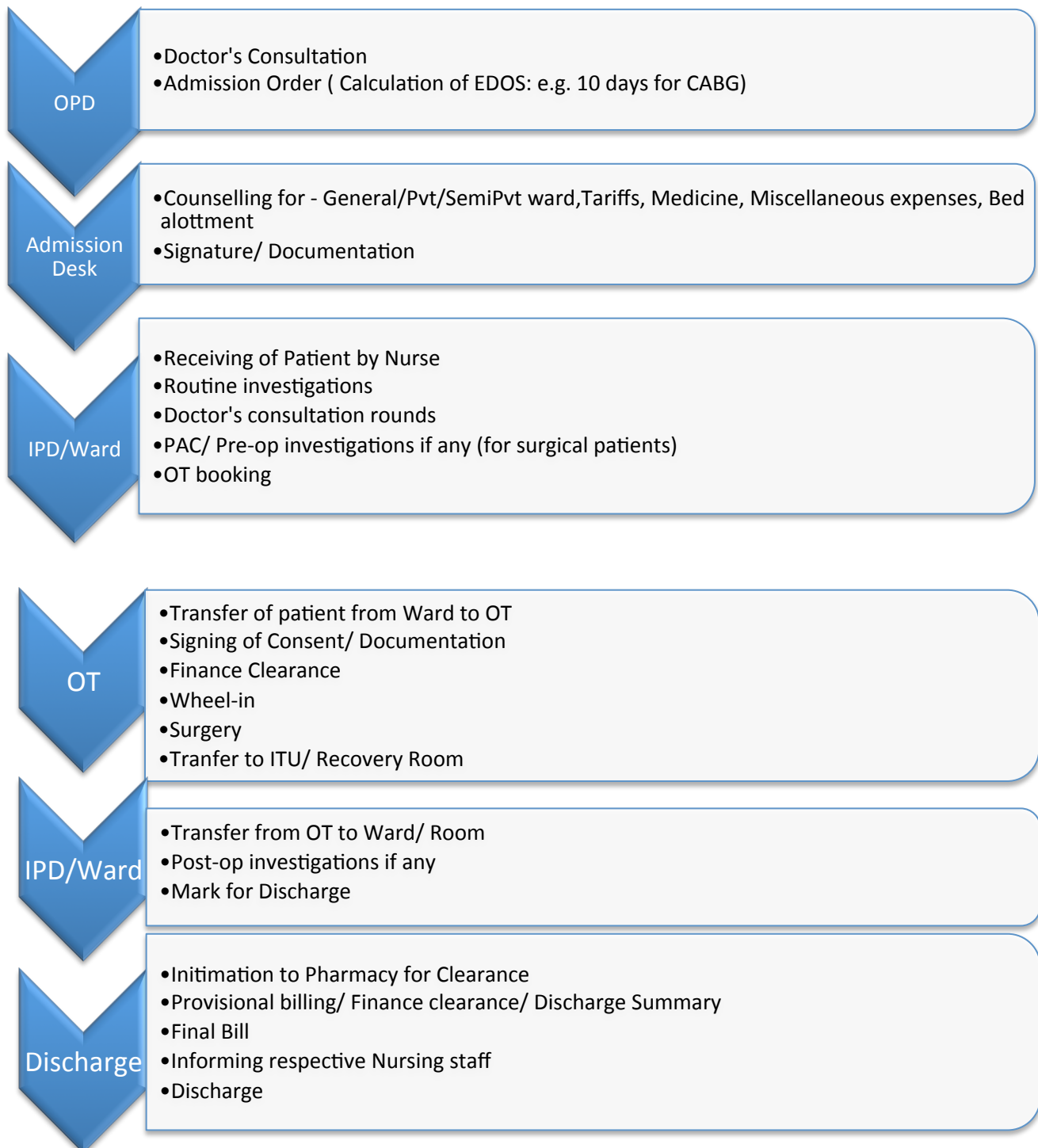
## **AIM:**

The Aim of the project is to study and analyze how to optimize the stay of the patient towards improving ALOS further.

## **OBJECTIVES:**

- To study the factors contributing towards the prolonged stay of patients
- To provide suitable recommendations to reduce the subsequent length of stay of patients.

## Process Mapping – ADT (Admission, Discharge, Transfer)



## **METHODOLOGY AND STUDY DESIGN**

- **Methodology:**

Research study design: Prospective cross sectional and analytical

Place of study: NH Hospital, Jaipur

Period of study: 20<sup>th</sup> April, 2016 to 20<sup>th</sup> May, 2016

- **Sampling Technique:**

Multistage sampling procedure:

1. Cluster Sampling
2. Purposive Sampling

The whole data has been collected from five wards of NH Hospital and each ward has been considered here as a cluster, for finding out the average length of stay of specific categories of patients and to find out the specific cause of delay, of patients from these wards.

- **Sample size:**

Out of five wards, each ward is considered as a cluster. Total discharged patients from these wards is 443 (target population)

Therefore Sample size is approximately 25% of monthly footfall in this area of the hospital, that is 100.

- **Tools and techniques:**

**Data collection method -**

- a) Tools: Observation, ward wise patient list
- b) Techniques: Survey (done with nursing staff, paramedics and relatives of patients)

**Description of NH's Average length of stay calculation**

**Average Length of stay:** The Average No. of days stay in hospital and is calculated as

Cumulative no. of days for each patient (during a particular period)

$$\text{ALOS} = \frac{\text{Total No. of patients admitted in the hospital during the period}}{\text{Total No. of patients admitted in the hospital during the period}}$$

The ALOS and the bed occupancy rate were calculated by taking the data of patients admitted in the hospital from the given time period of 20<sup>th</sup> April, 2016 to 20<sup>th</sup> May, 2016. The data was carefully examined and then used for the calculation after which it was used for the further application in the given formula to get the ALOS and BOR.

**Percentage of Bed Occupancy:** The percentage of inpatient beds occupied over a given period. Its calculated as:

$$\text{Percentage of Bed Occupancy} = \frac{\text{Total No. of patient's days for a given period} \times 100}{\text{Total no of beds in the hospital} \times \text{time period}}$$

The number of hospital beds occupied by patients expressed as percentage of the total beds available in the ward, specialty area, or region. It is used to assess the demands for hospital beds and hence to gauge the appropriate balance between demand for healthcare and number of beds.

BOR's have been proposed to reflect the ability of a hospital to provide a safe efficient patient care. A Hospital bed is both scarce and expensive commodity in healthcare. Administrators running these hospitals are in dire need of objective measures and methods for efficient management of their limited financial resources. Bed utilization rates can be of immense help in realistic and effective decision making. Normal rate of occupancy vary with the size and the type of the hospital and the other factors affecting the utilization of the hospital facilities. It has been seen that small hospitals have a lower BOR as compared to larger Hospitals.

### **Optimum Rate:**

The optimum BOR of the hospital should be between 75%-80%. As this ensures less waiting time for the patients in the hospitals for admission, it also allows the emergency case to be treated in the right time. As unavailability of bed in hospital may cause serious complication for the patient and his condition by achieving optimum bed occupancy we can resolve this problem too.

## Bed Turnover Rate

The time difference or the interval between the discharge of the patient or the time the patient leaves the bed and the admission of another patient on the bed in the hospital.

$$\text{BOR} = \frac{\text{No. of discharges (separations) in the period}}{\text{Available beds}}$$

## Types Of Patients (according to mode of payment)

- a) **CASH:** These include the largest group of patients admitted to the inpatient department. These patients pay the hospital fees and the hospital charges in the form of cash at the time of discharge in the billing section.
- b) **THIRD PARTY ADMINISTRATOR:** this category includes the insurance patients who have cashless treatment or hospitalization based on their health policy and benefits. The billing department settles the bill with his/her insurance company during the time of the discharge.

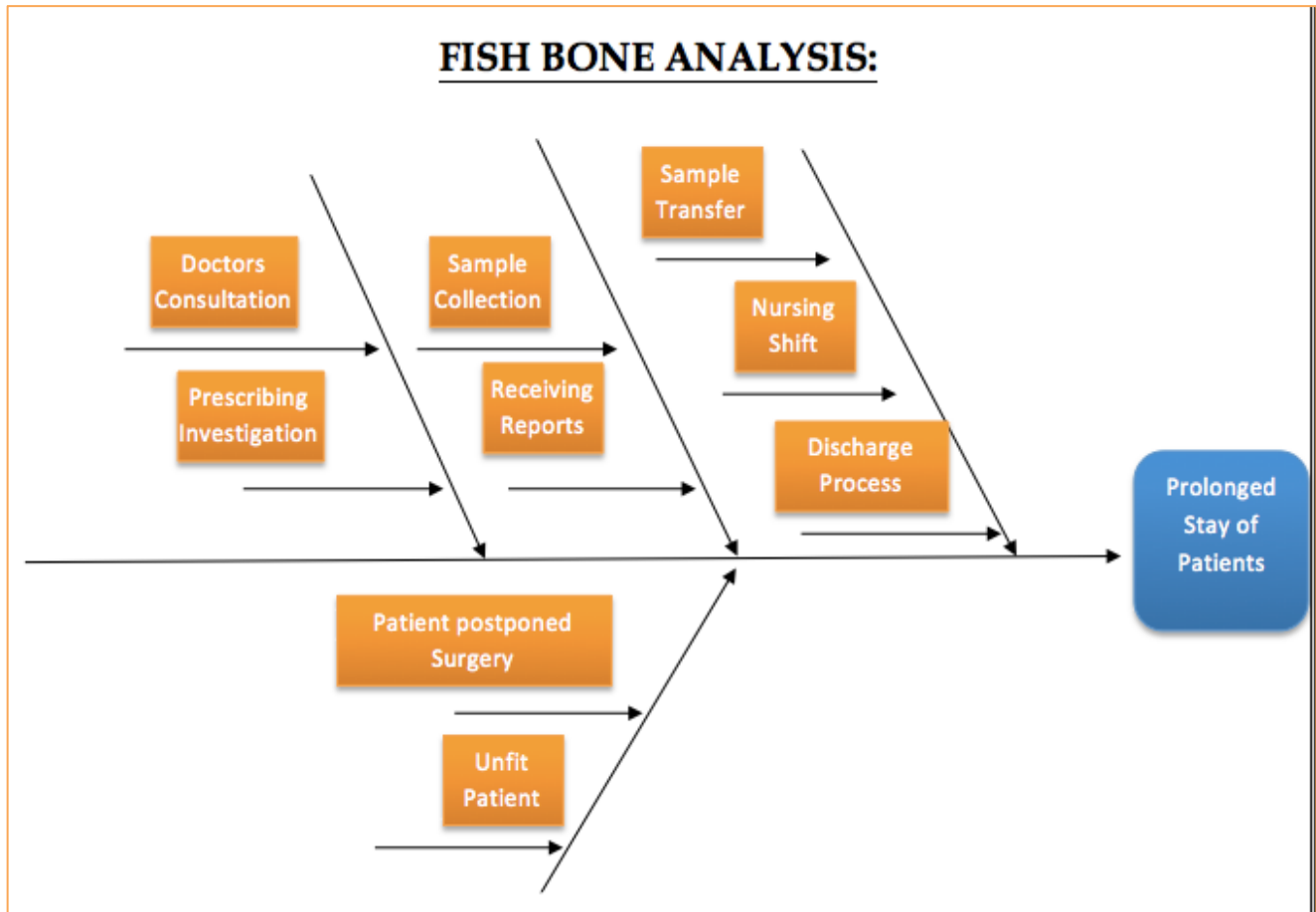
## DATA INTERPRETATION AND ANALYSIS OF ALOS:

The Average Number of days stay in hospital and is calculated as

$$\text{ALOS} = \frac{\text{Cumulative no. of days for each patient (during a particular period)}}{\text{Total No. of patients admitted in the hospital during the period}}$$

## ❖ OBSERVATIONS DURING THE STUDY OF ALOS

During the study period in the hospital, there were various clinical and non-clinical reasons which can be attributed to the prolonged stay of patients in the hospital. This Fish Bone analysis depicts contributing factors for prolonged stay of patients.



❖ Analysis of Contributing Factors towards Prolonged stay

**DISCUSSION:**

Factors resulting in Prolonged Stay:

The major factors causing prolonged stay of patients in NH Hospital, Jaipur can be broadly classified into four sub-categories, which are

TREATMENT

- Delay in Doctors' Consultation
- Delay In Prescribing Reports

INVESTIGATIONS

- Delay In Receiving Reports
- Delay In Sample Collection and Transfer to the Lab

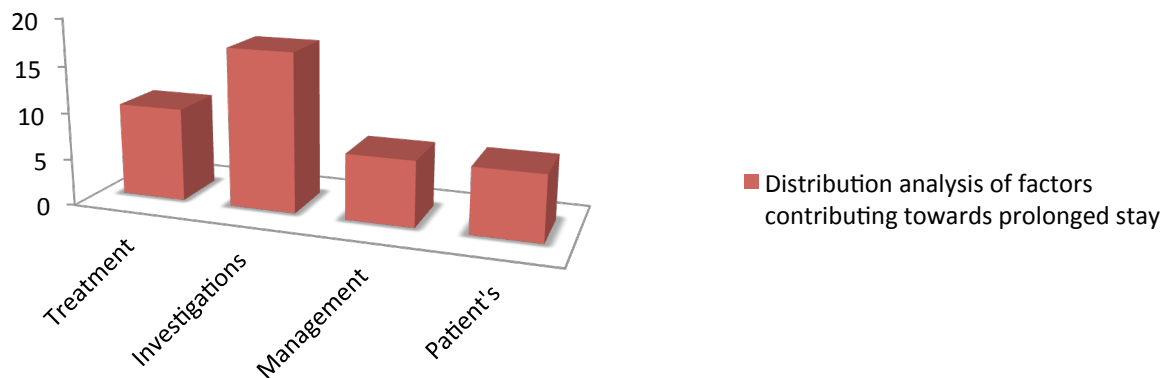
### MANAGEMENT

- Delay due to Discharge Process
- Nursing Shift Exchanges

### PATIENT

- Unstable Patients Condition
- Postponing Of Surgery/Procedures

### Distribution analysis of factors contributing towards prolonged stay



### TREATMENT

- Delay in Doctors' Consultation:** it has been observed that discharges are not confirmed on time as the respective episode doctor does not consult the patient on time. So the nursing staff and the other administrators do not receive the discharge order on time. So all related steps gets delayed. Senior doctors are engaged performing surgeries and their team and other junior doctors/consultants have to assess them.
- Delay in Prescribing Reports:** In few cases it was observed that late doctor's attendance during Doctors Consultations results in delaying of pre-op and post-op investigations further prolonging stay of patients.

## **MANAGEMENT**

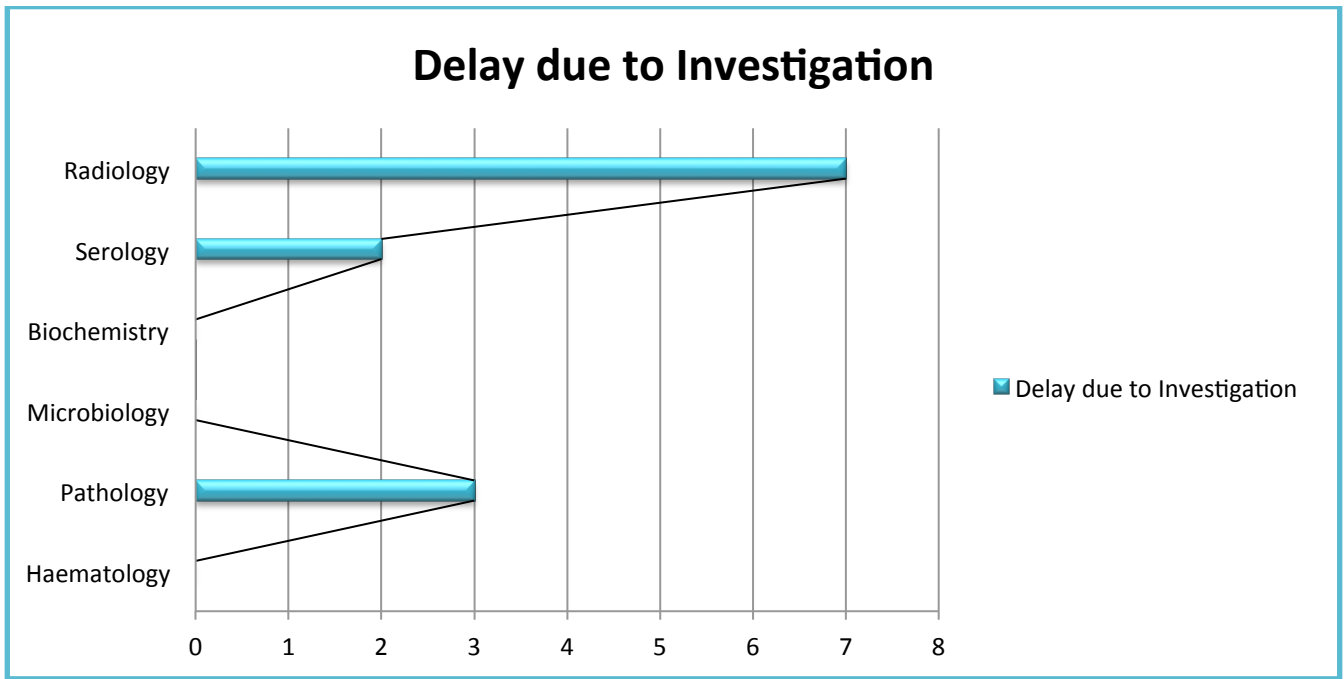
- c) **Delay due to Discharge Process:** Billing clearance is the biggest barrier in making the discharge process smooth. A patient seeks for the comfort in getting the billing clearance done. Patient usually does not want to leave before the lunch hours. Even if they get the clearance done they won't return the clearance slip back to the nursing team. As a result nursing team cannot discharge the patient in the minimum assigned time for the discharge. In case of TPA patients there are a number of protocols to be followed by the attendant and the TPA Department, that takes time to get the authorization of bill from the TPA Company. Delay in discharge summary is another major reason for delays in discharge process. It was observed that while preparing the discharge summary the general assistants have to wait for the doctors to make any corrections, modifications, addition in the discharge summary as they can only complete the discharge summary once it has been approved by the consultant.
- d) **Nursing shift exchanges:**
- Delay may occur in carrying forward the discharge process on behalf of nurses as she may be busy with the doctor during the doctor round as the nurse may have different doctors for different patients and they may have difference in their patient's rounds.
  - Nurses are busy with patients especially during the morning hours with the treatment plan of the patients as given by doctors whether there is change in medicines or to continue the same medicines.
  - Change in the shift of nurses takes place at 14:00 and 20:00 hrs. At this time the patients of TPA are in middle of the discharge process. So the next nurse on duty has to take the process further. It may delay the process only by few minutes but it is important.

## **INVESTIGATION**

- e) **Delay in Receiving Reports:**
- First reason is lack of performing staff. Then again if consulting doctor does not give a basic framework of reports to be made, other people can't give a final layout. So reports are usually not prepared on time. Patient, attendant have to wait for the reports at the time of discharge resulting in the increased TAT.

**f) Delay in Sample Collection and Transfer to the Lab:**

Sometimes the investigation sample is not collected on time hence the whole process of investigation and reporting gets delayed thereby increasing the TAT.



Amongst whole sample of data, it was found that the stay of maximum patients was prolonged due to delay in Investigations in the period of 20<sup>th</sup> April to 20<sup>th</sup> May, 2016.

On further assessment of different investigations departments, it was found that high number of cases were delayed due to Radiology followed by department of Pathology and Serology respectively.

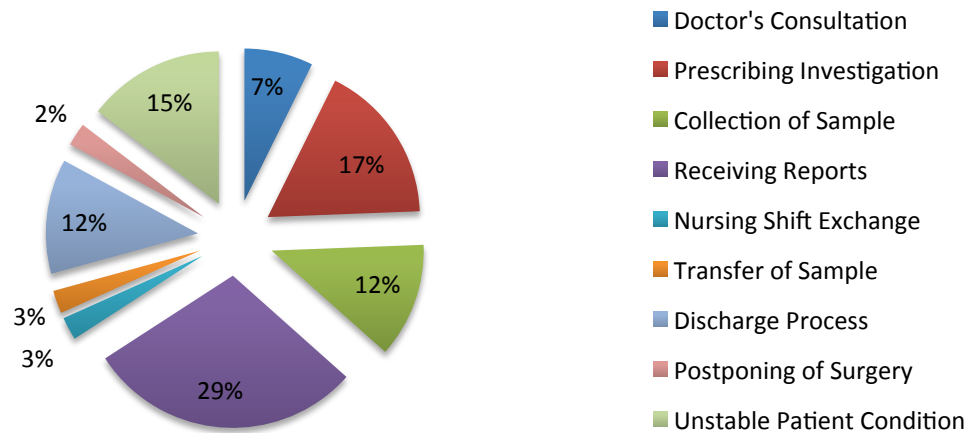
**PATIENT****g) Unstable patient's condition**

- In few cases the patient is not completely fit clinically for discharge, thereby prolonging the stay in the hospital.

**h) Postponing of Surgery**

- It has been observed that, at times the patient is reluctant in undergoing surgery that is scheduled previously due to various personal and religious reasons.

### Major reason behind prolonged stay of patients



#### Analysis of different reasons contributing towards the prolonged stay of patients in the hospital

All these reasons of delayed discharge lead to high bed occupancy and low bed turnover rate which ultimately results in decrease in the ARPOB (Average Revenue per Occupied Bed) of the Hospital.

### **RECOMMENDATIONS:**

**The Average Length Of Patients Stay's** mainly depend on disease profile of the patient as the non-surgical patient required to be admitted for longer days for close observation along with the intensive care unit patients. But apart from clinical reasons there are some non-clinical reasons, found during the study, which helps to decrease ALOS.

Suggestions which can be used for decreasing ALOS in NH:

- **Investigations:** Pre-procedure investigations are a very crucial event for all the procedures. During the study it has been found that the investigations play a major part of pre-procedure reasons for high length of stay in all type of cases, by doing investigations in OPD or in Day Care level we can decrease length of stay.

- **TPA clearance:** During the study it has been seen that in case of TPA patients there are a number of protocols to be followed by the attendant and the TPA department that it takes time in getting the authorization of bill from the TPA Company.

There is a possible solution for this problem which has been already implemented in few hospitals of south and till now its running successfully. They establish a tie up with all TPA's that they will send them all the necessary paper one day prior to discharge & TPA companies will complete all the formalities by the same day after that a very small charges are left for the discharge date like-room rent or consultant fee and as they have all the necessary paper so they wont find any problems to approve that small amount on the discharge date by 11:00 am in the morning. By implementing this solution NH can also discharge all the TPA patients within the Protocol.

### **LIMITATIONS**

- Major limitations of the study are that whole of the long stay patients population could not be included in it as there were some areas in the hospital where patients are kept in isolation and peaceful environment were required, like PICU so it was difficult to collect data from these areas.
- The reason given for prolong stay may contain some ambiguity as there were limited access to patients and their relatives to get information about their reasons completely and accurately.

### **CONCLUSION**

The average bed occupancy rate in NH is 60-70% for non-critical patients and 70-80% for critical patients. Thus NH is continuously facing the problem of prolonged length of stay of patients and high bed occupancy rate. This leads to low bed turnover rate, higher bed occupancy present in the hospital and unnecessary long waiting hours by the patients for the admission to the inpatient department..

Hospital can easily deal with this problem by implementing few interventions like optimizing the length of stay of patients, focussing on case mix and pre/post-op investigations which will ultimately have an impact on Average Revenue per Occupied Bed.

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