Assessment of Patient Safety at Narayana Hrudayalaya – Malla Reddy Hospital, Hyderabad

A dissertation submitted in partial fulfillment of the requirements
for the award of

Post-Graduate Diploma in Health and Hospital Management

By

Dr Veenu Choudhary

International Institute of Health Management Research

New Delhi -110075

April, 2011

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under the guidance of

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New Delhi -110075

April, 2011

Certificate of Internship Completion

Date: 15th April'2011

TO WHOM IT MAY CONCERN

This is to certify that **Dr. Veenu Choudhary** has successfully completed her 3 months internship in our organization from January 17, 2011 to April 15, 2011. During this internship, she has worked on **"Assessment of Patient Safety at Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad"** under the guidance of me and my team at Narayana Hrudayalaya Malla Reddy hospital, Hyderabad.

We wish him/her good luck for his/her future assignments

(Signature)
Mr. Hanuman Prasad
Chief Operating Officer
Narayana Hrudayalaya Malla Reddy Hospital
Hyderabad

Certificate of Approval

The following dissertation titled "Assessment of Patient Safety Culture at Narayana Hrudayalaya –Malla Reddy Hospital, Hyderabad" is hereby approved as a certified study in management carried out and presented in a manner satisfactory to warrant its acceptance as a prerequisite for the award of Post-Graduate Diploma in Health and Hospital Management for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.

Dissertation Examination Committee for evaluation of dissertation

Name	Signature
_____	_____
_____	_____
_____	_____

Certificate from Dissertation Advisory Committee

This is to certify that Dr. Veenu Choudhary, a participant of the Post- Graduate Diploma in Health and Hospital Management, has worked under our guidance and supervision. She is submitting this dissertation titled "Assessment of Patient Safety at Narayana Hrudayalaya – Malla Reddy Hospital, Hyderabad" in partial fulfillment of the requirements for the award of the Post- Graduate Diploma in Health and Hospital Management.

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

Dr Anandhi Ramachandran
Assistant Professor
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New Delhi
20th Apr'2011

Mr. Hanuman Prasad
Chief Operating Officer
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Hyderabad
15thApr'2011

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I would like to express my heartfelt thanks & gratitude to Mrs Salima Thomas, Nursing Superintendent and Ms Surekha, Senior Executive-Quality without whom this project would not have been a reality.

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Last but not the least I would like to thank my family for being the pillar of support for me throughout my life.

Thank You

Dr. Veenu Choudhary

Abstract

Assessment of Patient Safety at Narayana Hrudayalaya – Malla Reddy Hospital, Hyderabad

By

Dr Veenu Choudhary

This study provides an assessment of patient safety of a corporate hospital which has a vision to provide high quality care at low cost to masses worldwide. The study objective is to do a multilevel assessment for pharmacy, laboratory, imaging and nursing departments as staff in these departments play a crucial role in the health outcomes of an outpatient as well as inpatient. The organizational culture, facility safety and knowledge & skills of the staff are important factors that have direct bearing on a patient's health and hence the study is focused to bring out the gaps by conducting a 360 degrees assessment of the area of interest. The methodology employed is a survey on patient safety culture, facility risk assessment through a checklist and gap analysis of the department of pharmacy, laboratory and imaging based on NABH standards relevant to these departments. The study findings show some of the most critical causes that have presently compromised patient safety in Narayana Hrudayalaya Malla Reddy Hospital. They are lack of training, closed communication, absence of standardization in processes, improper information sharing, poor staffing levels and certain facility safety factors.

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List of Abbreviations

ITU	Intensive Thoracic Units
GE	General Electronics
ECG	Electro Cardiogram
ECHO	
OPD	Out-patient Department
IPD	In-patient Department
OT	Operation Theatre
NH	Narayana Hrudayalaya
CCU	Coronary Care Unit
USG	Ultra Sonography
COO	Chief Operating Officer
HSOPSC	Hospital survey on patient safety culture
CT	Computed Tomography
MRI	Magnetic Resonance Imaging
NABH	National Accreditation Board for Hospitals & Healthcare providers
AAC	Assess, access and care
MOM	Management of Medication
FMS	Facility Management and Safety
N/A	Not Applicable

Part I

Internship Report

1. **Narayana Hrudayalaya**

Dr. Devi Prasad Shetty, also called "The Henry Ford of Heart Surgery" [1] under the aegis of the Asian Heart Foundation (AHF), started Narayana Hrudayalaya, Bangalore (spread over 25 acres) in May 2001, with a vision to provide quality healthcare to the common man at affordable cost. Since its inception, the hospital has offered the highest standard of heart care to patients from all over India, neighboring countries and other parts of the world. Today, the institute is recognized as a leader in the field of cardiac surgery, Interventional cardiology and cardiac diagnostics. The institute has specialized in offering Pediatric Cardiac surgery to high risk patients and performs largest number of heart surgeries on children in the World.

Narayana Hrudayalaya group which has expanded to Kolkata, Dharwad, Jamshedpur, Hyderabad, Jaipur, Ahmedabad, Kolar has covered several milestones in its journey so far, some of which are quoted below:

MILESTONES OF NARAYANA HRUDAYALAYA HOSPITALS

- Performs over 45 heart surgeries in a day
- Largest number of pediatric heart surgeries in the world.
- Largest number of valve replacements in the world for year 2007.
- World leader in endovascular interventions for aneurysm of the aorta.
- First hospital in Asia to implant a 3rd generation artificial heart.
- Multispeciality, cutting edge, quality health care for all specialized centre for Cardio, Neuro, Cancer, Eye and Orthopedic Care.
- The largest dialysis unit in India.
- Most experienced in pediatric liver transplant in India.

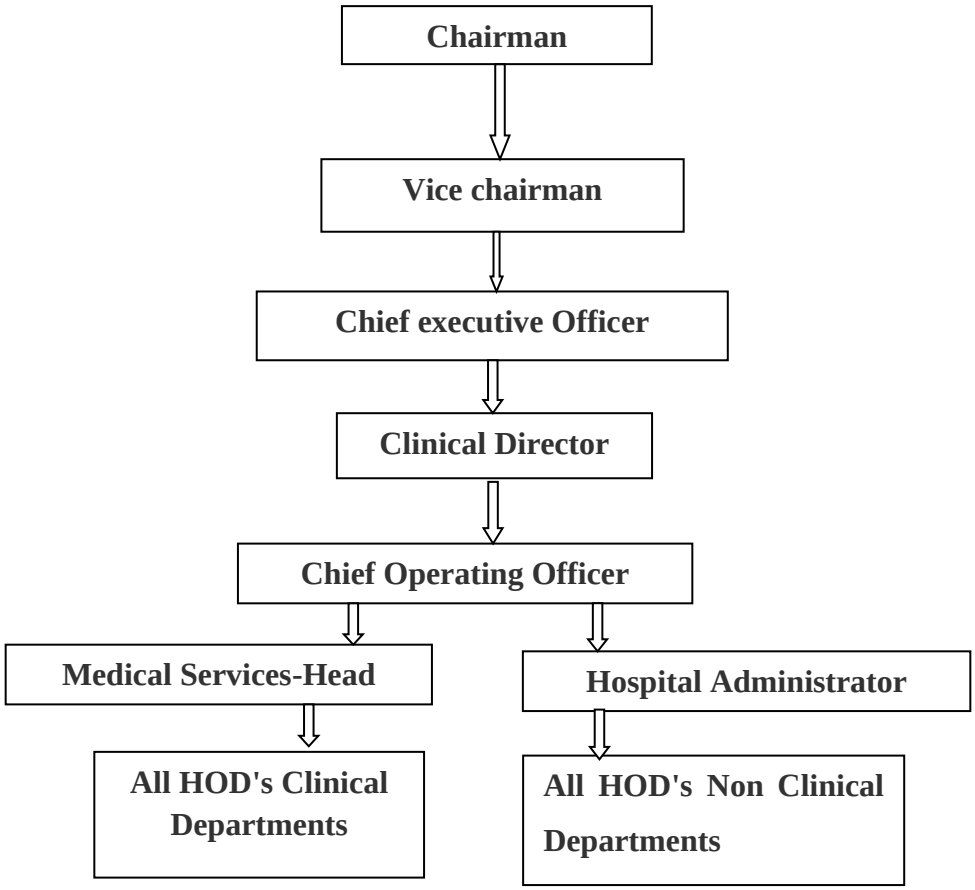
In association with the India's Space Research Organization, the NH group runs one the World's largest Tele-Cardiology programmes using ISRO satellite and till date has treated close to 35,000 heart patients.

Dr. Devi Shetty is on a mission to build 5,000-bed "health city" in Hyderabad and around 30,000 beds across India over the next five years.

2. NARAYANA HRUDAYALAYA – MALLA REDDY HOSPITAL, HYDERABAD

Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad is a 600 bedded multi specialty hospital having state of the art facility spread over 5acres of land. It is the convergence of latest technology & caring professionals from the medical field.

3.1 **Organizational Structure:**



3.2 Specialty services:

- Pediatric & Adult Cardiac surgery
- Pediatric & Adult Cardiology
- Anesthesiology & Critical Care
- Nephrology with Dialysis Facility
- Urology
- General Medicine & General Surgery
- Neurology & Neurosurgery
- Orthopedics
- Obstetrics & Gynecology
- Pediatric & Neonatology
- Pediatric Surgery
- Ophthalmology
- Thoracic Surgery

- Plastic Surgery
- Pulmonology
- Interventional Radiology
- Endocrinology
- Dentistry
- All other Medical and Surgical Specialties
- Allied Supportive and Laboratory facilities

3.3 Infrastructure & Human Resource at Narayana Hrudayalaya, Hyderabad

NH have some of the world's most experienced doctors in their respective fields to join in the mission of caring. Needless to say, they have graduated and practiced at the best hospitals of India and from the US, UK, Australia, and other parts of the world.

Table 1: Infrastructure & Human Resource at Narayana Hrudayalaya, Hyderabad

Total no of Beds	600
Total No. of OT	9
Cath labs	2
Cardiac Surgeons	10
Cardiologist	10
Consultants	20
Other Doctors	20

Intensive Thoracic Units (ITU):

- 56 Bedded ITU is equipped with state-of-the-art monitoring and life support systems for patients in critical condition, and is supported by specially trained, attentive and efficient staff.

- 4 ITUs exclusively designed for the intensive care with a capacity of total **56** beds. Each bed is fully equipped with Aestivate GE Ventilator systems, Defibrillator, GE Dash 2500 Monitor with color display for the measurement of ECG, ST, SPO2, and NIBP.1 Step down ITU for relatively stable patients with **25** beds.

Operation Theatres

- Nine state of the art operation theatres
- Out of which 4 are exclusively for Cardiac Surgery.

Cardiac Catheterization laboratory

- Two Cath labs equipped with PHILIPS Allura Xper FD10 C Cath Lab.

Coronary Care Unit

- 34 bedded Coronary Care Unit for post cath patients well equipped with Aestiva GE Ventilator systems, Defibrillator, GE Dash 2500Monitor with color display for the measurement of ECG, Resp, ST, SPO2, NIBP etc.

Diagnostic Facility

- **Imaging Services** including Digital radiography, Gamma Camera for nuclear scans, Spiral CT scans, Mammography, Ultra Sonography, Echocardiography with Colour Doppler, CT and Ultrasound guided procedures, C – Arm, PET CT (in the pipeline). ECHO, Color Doppler, Vivid S5 High Performance Echocardiography system with Adult and Pediatric probes Tread Mill Test, GE Marquette MAC 5500 computerized stress test with TM 2100 imported Treadmill, Electrocardiography, X-Ray and Clinical Laboratory, UltraSonography

- **Laboratory & Blood Bank Services** including Cytology, Histopathology, Frozen Sections, Immunohistochemistry, Cytochemistry, Tumour Markers, Hematology, Biochemistry, Clinical Pathology, Microbiology & Serology. Some

of the best quality machines installed are: Coagulation Machine Make Transasia Biomed Ltd, Hematology Machine LH 500 Beckmen Coulter, Siemens Urisys600 and Urisys200, Auto Blood Gas Analyzer and Other State of the art Equipments.

3. Managerial Tasks Performed

The following programmes were undertaken by me as part of my learning during the internship period in Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad.

Managerial Task 1:

As part of my internship, I was posted in the Administration Department as a Management Trainee. I was assigned the responsibility for general management of the front office and out-patient department. The front office is divided into three sections i.e. Enquiry/Reception, Registration and Out-Patient billing. The total number of employees working in this area is eight, including, 5 Patient relations executive, 1 Floor Coordinator and 2 billing persons over three daily shifts. The OPD consists of 10 Consultation Rooms, 1 Screening Room, 1 ECHO Room, 1 ECG & TMT Room, 1 USG Room, 1 Sample Collection Room, 1 Laboratory (Biochemistry & Microbiology).

Main work responsibilities included:

1. Sending daily census of OPD, IPD, Bed Occupancy, Radiology and OT to the NH corporate office in Bangalore.
2. Ensuring smooth functioning of the Front office and OPD on day today basis.
3. To ensure that all the patient reports are dispatched in time.
4. Addressing patient complaints and grievances.
5. Addressing staff complaints and grievances.

6. Ensuring good coordination and communication amongst the various stakeholders of my work area.

To carry out daily responsibilities and research study, I needed to interact with almost all the hospital departments on various occasions. This included:

- CCU & CATH LAB
- WARDS –General, Private, Semiprivate, Deluxe
- Investigations
- Marketing
- Accounts
- Human Resources
- Finance
- Maintenance

During my initial interaction with the various employees in my work area I was involved in learning the basic processes of the department which have been depicted in a flowchart form below:

Enquiry Desk/ Reception Desk

- Handled patient's/attendant's enquiries related to registration process, investigation tariff, reports, consultation timings and consultants, in-patient attendant passes, etc.
- Report dispatch
- Issuance of attendant's pass

Registration Desk

- New Patient registrations for OP & IP patients
- OP/IP cards for first follow up visit patients

OP Billing Desk

Billing for:

- OP Consultations
- Registrations
- Investigations

It is a well known fact that a front office is the face of an organization & a front office executive is the brand ambassador of the organization. Hence front desk etiquettes are very vital as it promotes the image of the organization. Most importantly the front office staff should be: Presentable, Courteous, Prompt and Professional in their attitude and behavior with the hospital customers i.e. patients, attendants, and other visitors.

During the course of my stay in the department I observed that the front office staff lacked the basic requirements to provide flawless service to all the old and new patients seeking healthcare from Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad which is presently in process of developing a strong customer base amongst the educated upper middle class families in and around Hyderabad. Since the hospital is located 20 kms outside the main city Hyderabad, it is difficult not only to make a new customer but also very challenging to retain an existing customer. On many occasions it was observed that the staff could not effectively communicate with the customers either due to lack of complete information at hand, poor communication skills, unimpressive body and confusion leading to customer's outburst from time to time. On doing a root cause analysis for the same it was found that no training sessions had been conducted for the front office staff in past due to which they lacked orientation towards their job responsibilities and behavior.

To understand the training requirements of the front office staff, a training need assessment form (**Annexure 1**) was designed and after approval from the Chief Operating Officer, Mr. Hanuman Prasad the form was circulated amongst the

administrative staff that included various sub departments i.e. Front Office (self paying and Aarogyasri), Back Office and Tele calling, on a total of 28 employees. The employees were analyzed on the following parameters:

1. General Information about the current job to find out their awareness about their job description and which all activities needed to be added or deleted from it.
2. Specific questions regarding current job to find out whether they are required to work as part of a team or individuals, the level of technical knowledge required to perform their job, etc.
3. The training requirements for the current job.
4. Their need for future development in terms of knowledge and skills.

After completing the analysis of all the filled forms received back from the respondents, few striking revelations came out. Some of them are listed below in order of priority:

- English, Soft skills, idea about all departments
- Medical Terminologies, Interpersonal Skills, Communication Skills
- Desire to work in various sub areas of the administration on rotation basis.
- To get absorbed in higher positions in the hospital if vacancy existed.
- Grading themselves on a scale of 5 for the above mentioned parameters, related to personality, attitude, behavior and values.

After a discussion with the COO, decision was made to begin "Spoken English and soft skill development program" for the administration department frontline staff but eventually it became a program for the entire hospital as part of the employee development program. Negotiation was done with various spoken English centers across Hyderabad and finally Mr. Ramana Reddy was chosen as

the ideal candidate to educate our hospital staff on the principles of Spoken English & Soft Skills. A plan for the classes was chocked as follows:

1. Classes were conducted twice daily. Morning 8:00 am to 9:00 am and evening 5:45 p to 6:45 pm. Two classes per day were planned to prevent inconvenience caused due to shift variation in different departments.
2. Two batched of 40 students each were made.
3. A total 30 hours course was developed which was divided into 3 sections of 10 hour each.
4. Section A consisted of grammar and sentence making.
5. Section B was focused on group discussions and skits.
6. Section C focused mainly on the body language and soft skills development.
7. A pre and post training assessment was done to gauge the effectiveness of the training.
8. A certificate was awarded to all the participants who cleared the post training assessment of 100 marks by scoring 40% marks.

The first batch of "Spoken English and soft skill development program" commenced on 21st February' 2011 and finished on 10th April'2011 and completion certificate (**annexure 2**) was awarded to 68 students. Feedback was taken from students to assess the quality of training and analyzed. Students found Section A & B more effective as compared to the Section C.

Managerial Task 2:

In view of the celebration of International Women's Day, the management of Narayana Hrudayalaya Malla Reddy Hospital planned to launch a health plan which could suit women of all ages and hence became the health partners with The Hindu newspaper for the event "HEELS ON WHEELS". Around 200 women were expected to attend the event at Prasad Multiplex on 6th March'2011

and therefore a decision was taken by the hospital management to launch the women health plan on the same day. I was assigned the task to design the plan.

Steps involved in designing the health plan:

1. Outlining the target group i.e. 18 years and above.
2. Listing the possible health problems faced by the women in this age group (example: diabetes, hypertension, breast cancer, cervical cancer, etc.)
3. Listing the options to prevent these health problems.
4. Choosing the minimal but most essential investigations that would cover the health problems related to this age group.
5. Costing for each investigation that is included in the plan.
6. Adding certain value added services along with the original package.

After multiple brainstorming sessions the "Women of the Day" health plan was designed to be launched on 6th March'2011. The Details of the health plan can be seen in annexure 3 of this report.

Marketing for the "Women of the Day" plan was done in the following ways:

1. Free Health check up camp as the Health Partners for "Heels on Wheels" on 6th march'2011 at Prasad I-max to sensitize the women from middle and upper middle segment of the society.
2. Half page advertisement was released in The Hindu newspaper on 6th March'2011.
3. "Women of the Day" Leaflets were placed in all the daily news papers on 6th March 2011.
4. SMS and e-mails were sent to the HR managers of various companies in the radius of 20 kms to our hospital on Women's Day.
5. SMS and e-mails were also sent to all the current and previous customers on Women's Day.

6. Lectures on the importance of nutrition, fitness and gynecological health were delivered to students of various Girl Colleges by our eminent Consultants.
7. Leaflets were distributed in various Girl colleges in the primary catchment area of the hospital.

Managerial Task 3:

A health insurance scheme was designed for 30,000 students and 2,000 staff (teaching and non teaching) for Malla Reddy group of Institutes, Hyderabad.

A proposal was designed and after approval from Mr. Hanuman Prasad, COO, Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad and Dr Devi Prasad Shetty, NH Group Chairman, the proposal was presented to the Chairman, Malla Reddy group of Institutes, Shri Malla Reddy and Director Admin Mr. Ram Reddy for approval.

We are awaiting the acceptance from Malla Reddy group of Institutes, so that we can go ahead with the announcement of the scheme and enrollment of student and faculty of the group of institutes.

Part II

Dissertation

On

"Assessment of Patient Safety Management at Narayana Hrudayalaya – Malla Reddy Hospital, Hyderabad"

Chapter 1
Introduction

1.1 Introduction of Dissertation:

In Healthcare, every point in the process of care-giving contains a certain degree of inherent unsafe practice. The operation of a healthcare organization depends upon a complex interaction between the patient, the environment in which care is provided and the people, equipment and facilities that deliver the care. Lapse in patient care may result from problems in any of these [2]. Hence, patient safety improvements demand a complex system-wide effort, involving a wide range of actions in performance improvement, environmental safety and risk management, including infection control, safe use of medicines, equipment safety, safe clinical practice and safe environment of care. Thus, patient safety can only be achieved by the establishment of operational systems and processes that minimize the likelihood of errors and maximize the likelihood of intercepting them when they occur [3]. Literature on patient safety identifies various factors responsible for safe patient care [3]. This study report has identified and enlisted three main factors whose intersection is crucial to ensure highest degree of patient safety. (Fig1)

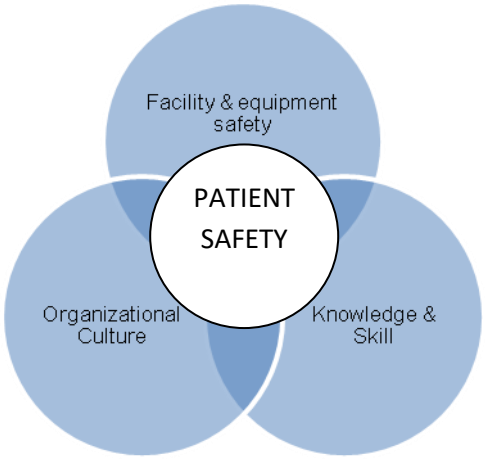


Figure.1 **FACTORS RESPONSIBLE FOR SAFE PATIENT CARE**

The safety culture of an organization is the product of values, attitudes, perceptions, competencies and patterns of behavior of individuals and groups that determine the "Patient Safety" style and proficiency of an organization. Organizations with a positive safety culture are characterized by communications based upon mutual trust and shared perceptions of safety and by the efficacy of preventive measures. It is a well known fact that the desired improvements in patient safety require a change in the culture within healthcare organization.

Certain elements are a key to a strong Patient Safety Culture. Singer and colleagues (2003) identified the following seven patient safety culture elements [4]:

- Leadership commitment to safety
- Organizational resources for patient safety
- Priority of safety versus production
- Effectiveness and openness of communication
- Openness about problems and errors
- Organizational learning
- Frequency of unsafe acts

Safe facility means a better facility design, and its good management and control. Same stands true for equipment management in a health organization. The patients' and families' perception of safe patient care is directly related to the facility design, appearance and maintenance. For example: a non functional lift, electrical switches, poor lighting send a strong message of poor maintenance, which can turn out to be a reason for an adverse event in a healthcare organization.

Knowledge and skills of doctors, nurses, paramedics as well as the managers and technicians can lead to the collapse of the entire healthcare system when the employees perform their duty irresponsibly. A lack of knowledge about the

policies and procedures cannot be a defense for any employee whose negligence compromises patient safety norms and leads a patient into a state of ill health or death.

Ensuring the safety of everyone that comes into contact with health services is one of the most important challenges facing healthcare today, globally. Indian Healthcare is no different when we talk about Patient Safety. The issue of patient safety is of crucial concern to any healthcare organization and should be reflected in the length and breadth of the patients who are catered to. If statistics are to be believed then 1 in every 10 patients admitted in a US hospital suffer an adverse event. 80% of these events are easily preventable with 1 in every 20 adverse event sufferer dies as a consequence [5]. In India, the picture is more distressing as we do not even have the statistics that can give us an insight into the number of lives we lose every year to adverse/ sentinel events occurring as a result of severe medication errors, wrong site wrong procedures, poor communication, equipment breakdown or a disaster situation.

In such instances, harm is not only to the patient but also to the family, relatives and friends whose anguish causes distress to the staff, already dealing with adverse events. The financial implications, add tremendously to the pressure on hospital, limiting its ability to cater to more patients as well as provide higher quality services. The increase in length of hospital stay, monetary claims by affected patients costs in lacs of rupees to a hospital. How much more good could be done to hospitals with the huge sum of money that is otherwise spent in settling claims arising due to adverse events.

Narayana Hrudayalaya known globally for providing high quality but low cost healthcare services has to address the issue of Patient Safety to maintain an edge in the healthcare market as a chain of Patient friendly Hospitals or Safe Hospitals. This vision can only be achieved by creating an organizational culture of patient safety, holding all the stakeholders, not only doctors or nurses, equally

responsible for providing quality care and safe care to patients. The preparation for National Accreditation Board for Hospitals & Healthcare providers (NABH) accreditation by the organization will help it to assess the quality and safety of care being rendered by the organization. In this research study we will assess the patient safety of Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad to get a 360 degree view of its existing state of patient safety.

1.2 Review of Literature:

Patient safety has received increased attention in recent years, but mostly with a focus on the epidemiology of errors and adverse events, rather than on practices that reduce such events. In a number of high hazard organizations, where the risk of error involves dire consequences, leaders manage for safe, reliable performance. As a result, the term *High Reliability Organization* has been coined to describe organizations with exemplary track records of safety such as aviation, chemical manufacturing, shipping, nuclear power production, and the defense forces. The concept is rooted in the analyses of errors that reveal organizational failures, along with technical failures (related to system performance) and human limitations (related to human behavior) **[6]**. The application of safety promotion theories utilized to positive effect in other high hazard organizations are being considered for health care, where "accidents" tend to occur one person at a time instead of in sweeping disasters.

The aspect of organizational safety culture that may be visible or measurable is sometimes referred to as the safety "climate," which includes management systems, safety systems, and individual attitudes and perceptions. Health care organizations are now adapting safety culture and climate surveys from other industries to benchmark and identify potential deficiencies in their unique safety culture. While an exact definition of a safety culture does not exist, a recurring theme in the literature is that organizations with effective safety cultures share a constant commitment to safety as a top-level priority, which permeates the entire organization [4]. More concretely, noted components include: 1)

acknowledgment of the high risk, error-prone nature of an organization's activities, 2) blame-free environment where individuals are able to report errors or close calls without punishment, 3) expectation of collaboration across ranks to seek solutions to vulnerabilities, and 4) willingness on the part of the organization to direct resources to address safety concerns.

Developing a patient safety culture was one of the recommendations made by the Institute of Medicine at USA to assist hospitals in improving patient safety [7]. One of its study entitled "The Current State of Patient Safety Culture: a study at baseline" assessing the culture of safety in Lebanese hospitals was carried out by El-Jardali et al. (2010) in Lebanon. The study adopted a cross-sectional research design and utilized the hospital survey on patient safety culture (HSOPSC) **[7]**. The dimensions with the highest positive ratings were teamwork within units, hospital management support for patient safety, and organizational learning and continuous improvement, while those with lowest ratings included staffing and non-punitive response to error. Approximately 60% of respondents reported not completing any event reports in the past 12 months and over 70% gave their hospitals an 'excellent/very good' patient safety grade. Furthermore, in recent years, a multitude of evidence, mostly originating from developed countries, has been published on patient safety culture [8&9].

Certain studies have been done to find out impact of facility design on patient safety. Many clinicians, architects, and hospital administrators believe that the hospital built environment can benefit the satisfaction of health care providers as well as patient satisfaction and outcomes. There is also some evidence that nurse satisfaction with the built environment was related to general well-being and job satisfaction, two factors that are critical because of their impact on patient care. Designing for safety and quality can improve patient outcomes and safety, promote healing, increase patient satisfaction, and reduce costs. It is thought that the cost of building or remodeling projects based on design evidence conducive

to patient safety can result in organizational savings over time, without adversely impacting revenues **[10]**. With human factors in mind, there are several aspects of the built environment that should be considered. In a review of the literature by Henriksen and colleagues [11] the following design elements were identified as critical in ensuring patient safety and quality care, based on the six quality aims of the Institute of Medicine's report, Crossing the Quality Chasm: A New Health System for the 21st Century [12]. In all, most of the safety features of a built environment involve a reordering of functions in most "traditionally" designed facilities, minimally affecting capital costs, to improve the quality of care and patient outcomes.

Book by Dr S K Joshi also enlists a huge number of potential risks that a patient may face in a hospital such as child abduction, rape, murder, theft, homicide, suicide, fire, earthquakes, floods, radiation exposure, building collapse, hospital acquired infection, medication errors, equipment failure, and many more. The ways of dealing with clinical and non clinical potential risks to patients have also been enumerated such as streamlining of processes by quality certification by accreditation bodies like International Standards Organization, National Accreditation Board for Hospitals and healthcare providers and Joint Commission International [17].

Problem statement:

Patient safety requires that all members of the health care service delivery team be "patient-safety minded." It also depends on both hands-on patient safety practices and leadership within every discipline in health care. As a quintessentially collaborative activity, patient safety needs leaders in each area of clinical administration and in each clinical discipline—including doctors, nurses, pharmacists, and others—in addition to information management, equipment and facility management, and other areas. Patient safety practitioners truly include everyone in health care and thus they should

be aware of how organizational culture can have a bearing on the health of a patient.

Hence the assessment of current state of patient safety will help the top management to create strategies for improving the status in future. This study will help to identify issues related to patient safety management at Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad and their relationship with patient safety culture, facility management and policies of .the hospital.

1.4. Background to the problem: Genesis, Consequents, Current practices

There are numerous reasons for a patient to feel satisfactory or unsatisfactory as well as safe or unsafe; during and after experiencing the healthcare services in a healthcare organization. It can be turn-around time for investigations or service time of consultation for an Out-patient, can be Hospital acquired infection or mortality in case of an In-patient.

If we analyze some of these situations, we will find out that the Turn-around time for lab investigations may be more than the expected limit due to lack of manpower or poor infrastructure on one hand and poor inter/intra departmental communication or coordination on the other.

During the dissertation, it was brought to my notice certain incidents, that had an impact of quality of patient care and thus on patient safety at Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad. Few have been mentioned as follows:

1. Case of an out-patient: A 33 year old male patient who came for a second review to cross check his previous blood reports which showed ESR levels at 24 was shocked to see ESR value at 4 in Narayana Hrudayalaya Malla Reddy Hospital lab reports. He requested for a repeat ESR and to his surprise the repeat ESR report showed a value of 21.

2. Case of an in-patient: A 49 year old female patient who came to the hospital for a valve replacement had a history of taking medication for heart trouble as well as renal stones. After admission her required lab investigations were done. The lab reports showed serum creatinine levels within normal limits and then she was advised for a CT Angio. Post investigation, her urine output decreased to nil per day. On further investigations her serum creatinine levels were found to be 6 indicating a problem with her kidneys. No root cause analysis was performed to determine the cause of kidney failure. Having known that incidents like as mentioned in case 1 were prevalent in the hospital the follow-up would have thrown light on the actual cause be it incorrect medication, or adverse drug effect, or a probable wrong lab report etc.

None of the above events were reported. Neither a root-cause analysis to find out the reason for the problem nor preventive or corrective action was taken to prevent such events in the future was done. This is a snap shot of patient safety existing at the hospital. But these one or two incidents do not give us a clear picture of the current state of patient safety at the hospital. Hence, to find out the existing status, we are required to conduct an assessment of patient safety at Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad.

1.5 Rationale and Scope of Study:

The purpose of this report is to identify the main organizational and human factors existing in the hospital that have relevance for patient safety. The focus is on the healthcare staff working environment and its effect on the performance of the departments considered and hence patient safety outcomes. The sample population for this survey on patient safety culture made up of Nurses, Pharmacists, Laboratory and Imaging Technicians. Additionally, in the view that the hospital has been delayed in undergoing NABH pre-assessment due in February 2011, a NABH gap analysis has been

done for pharmacy, laboratory and imaging departments of the hospital to find out the deviation from the standard practices. The study conducted will help the management of the hospital to have an overview about the current patient safety management practices in the hospital and to update its policies and procedures to obtain NABH accreditation successfully.

1.6 Objectives:

General Objective:

Identification of current state of patient safety management practices existing in the hospital and provide recommendations for improving the quality of the same.

Specific Objectives:

- To study the patient safety culture in the clinical departments of the hospital.
- To compare and identify gaps between the existing standard operating procedure of relevance to Patient Safety in the hospital's Laboratory, Radiology and Pharmacy departments and the standard operating procedure of NABH.
- Develop a facility safety checklist and identify gaps.

CHAPTER 2

Data and Methods

2.1 Study area:

The study area was Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad with primary focus on the clinical departments to assess the existing status of patient safety management in the hospital as these areas have a primary responsibility to work together and bring the best results for patients.

2.2 Study tools:

Both qualitative (checklists, gap analysis) and quantitative (close–ended questionnaire) tools were utilized. Three main areas of investigation under this study have been identified to provide a comprehensive assessment of the patient safety at the hospital:

1. Organizational patient safety culture through quantitative approach.
2. Risk assessment of the Facility through qualitative approach.
3. NABH gap analysis- Personal interviews and observations of processes of pharmacy, laboratory and imaging, through qualitative approach.

The quantitative tool for the survey on patient safety culture that has been used in this study is adapted from the AHRQ (Agency of Health Research and Quality) questionnaire on patient safety culture. It has been modified as per the needs of management of Narayana Hrudayalaya Malla Reddy Hospital to suit the existing organizational culture.

2.3 Sampling and Data Collection:

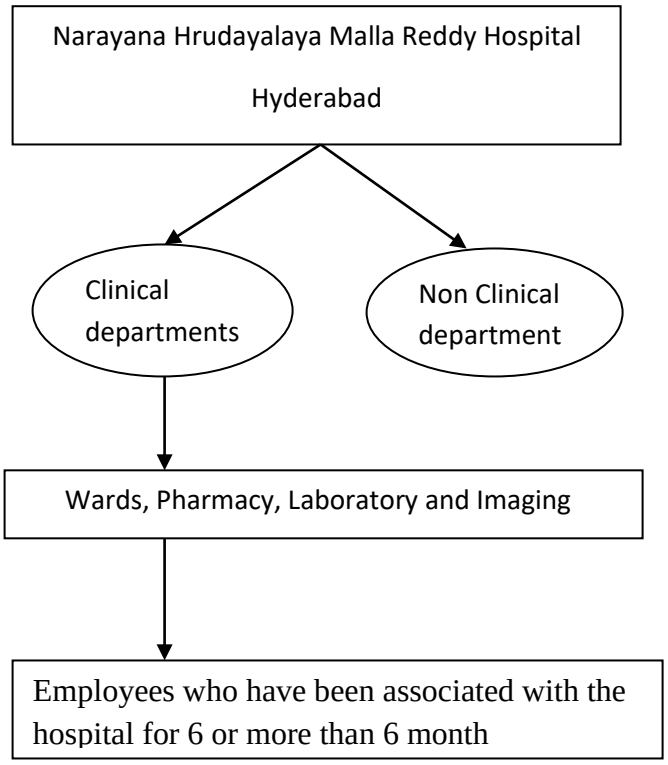
2.3.1 Organizational patient safety culture:

Primary data was collected through a structured questionnaire (Annexure 2). In the questionnaire various components were included to assess the patient safety

culture amongst the staff directly providing patient care i.e. nurses, pharmacists, laboratory technicians, radiology technicians. The questionnaire was pretested on a sample of 10 staff.

A sampling method was used. Sample variable was selected from Department of Nursing, Pharmacy, Laboratory and Radiology. The survey population was 245 (total of Nurses and paramedic). Selected sample size was 178 which consist of all the staff under the study area which has an association of 6 months or more with the organisation. 6 months time has been considered based on the existing human profile.

Figure2: Pictorial representation of sampling and data collection for survey on Organizational patient safety culture



1. All the hospital departments were divided into clinical and non clinical departments.

2. Hospital departments involved in direct patient care were the ones which made a direct contribution or impact in the quality of care he/she received in the hospital as out-patient or in-patient.
3. After going through a couple of brainstorming sessions with the mentor the following departments were enlisted to become a part of the study. They are: Pharmacy, Laboratory, Radiology and all the in-patient wards (including all from intensive care unit to general ward)
4. An eligibility criterion was set to include the staff in respective areas to become part of the survey sample i.e. employees who have been associated with the hospital for more than 6 month on the day of survey were included in the sample.
5. Therefore the sample size for the survey was the staff from the hospital Pharmacy, Laboratory, Radiology and all the in-patient wards who have been associated with the hospital for more than or equal to 6 months on the day of survey.
6. Questionnaire on Patient Safety Culture was used to conduct a survey across the above mentioned departments.
7. Total population for the study turned out to be 245, which was also the targeted sample size but after deleting non-responses, incomplete responses the final sample size was reduced to 178. The breakdown is as follows:

Table 1: Selected population for survey on patient safety culture

S.No.	Department	Selected Population
1.	Pharmacy (in-patient & out-patient)	**8**
2	Laboratory(hematology, biochemistry, microbiology)	**8**
3	Radiology (X Ray, CT, MRI, ECG, TMT, ECHO,USG)	**10**
5	All the in-patient wards (nursing staff)	**152**
	Total sample size	**178**

Note: (targeted sample size was 245 but after deleting non response, incomplete response the actual sample size was reduced to 178.)

8. Total 178 questionnaires were finalized after scrutinizing the filled questionnaires.

2.3.2 Risk assessment of the Facility:

Primary data collected by using a facility safety checklist which was based on the threat based risk assessment of the areas of interest. Under the following sub sections a spot inspection (non participatory observations done during facility rounds) of the facility was conducted:

1. General Safety
2. Fire & Electric Safety
3. Housekeeping Safety
4. Maintenance

The components of the above sub sections on facility safety that were spot inspected were as follows:

- Lifts
- Stairway
- Entry and exits
- Fire alarms
- Fire extinguishers
- Cleanliness
- Waste management

These were the point of check based on the requirements of NHMR for obtaining NABH accreditation. The entire hospital areas, except OT were covered under risk assessment of facility. Risk assessment for OT could not be covered due to various reasons, packed surgery schedule being one of them.

2.3.3 Gap Analysis :

A Gap analysis was done for Laboratory, Imaging and Pharmacy services based on the objective elements of NABH accreditation standards which were related to the processes and outcomes. This helped in understanding the current status of patient safety by analyzing the departmental procedures and then identifying the gap between current status and NABH standards.

The following standards were assessed:

Table2 NABH Standards: Gap Analysis

STANDARDS	
AAC.7.	Laboratory services are provided as per the requirements of the patients
AAC.8.	There is an established laboratory quality assurance programme
AAC.9.	There is an established laboratory safety programme
AAC.10.	Imaging services are provided as per the requirements of the patients
AAC.11.	There is an established quality assurance programme for imaging services
AAC.12.	There is an established radiation safety programme
MOM.1.	Policies and procedure guide the organization of pharmacy services and usage of medication
MOM.2.	There is a hospital formulary
MOM.3.	Policies and procedures for storage of medications.
MOM.5.	Policies and procedures guide the safe dispensing of medications.
MOM.9.	Policies and procedures guide use of narcotic drugs and psychotropic substances.

Primary data was collected through personal interviews with department in charges, and non participatory observations made to identify the processes of each area under study.

2.3.4 Implementation of Data collection:

Initial permission was obtained from the Chief Operating Officer of the hospital, following which the study was conducted over three phases:

Phase 1: Questionnaire on Patient Safety Culture was distributed amongst the Nurses and Paramedics before their shift commenced during class room sessions conducted in view of data collection. The aim and scope of the study was explained to all the staff and then questionnaires were distributed and duly filled questionnaires were collected during the same session. Confidentiality was assured and the same has been maintained throughout the study.

Phase 2: Facility risk assessment was done through direct observations, records and personal interviews with the concerned people i.e. the Managers of Maintenance, Housekeeping and Security Department during Facility Management Rounds.

Phase 3: Gap analysis of Department of Pharmacy, Laboratory and Imaging through direct observations, records and personal interviews with the concerned Heads of Department.

2.3.5 Tool used for analysis:

The statistical analysis of data was done by generating bar graphs and pie charts. The graphs were generated using Microsoft excel.

2.4 Limitations of the study:

1.The gap analysis for nursing could not be completed due to lack of time and hence has not been included in this study.

2. The gap analysis framework has been attached in the annexure but the scores of the same have not been mentioned due to privacy issues of the organization.

Chapter 3

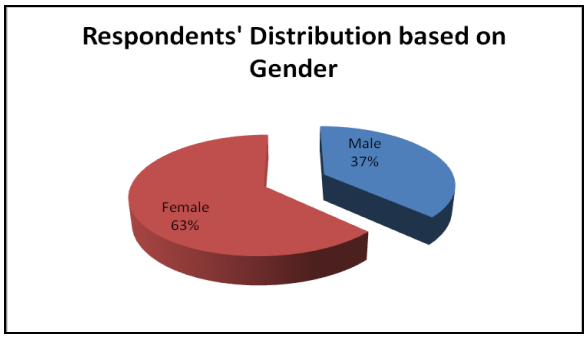
Results and Findings

3.1 Survey on patient safety culture:

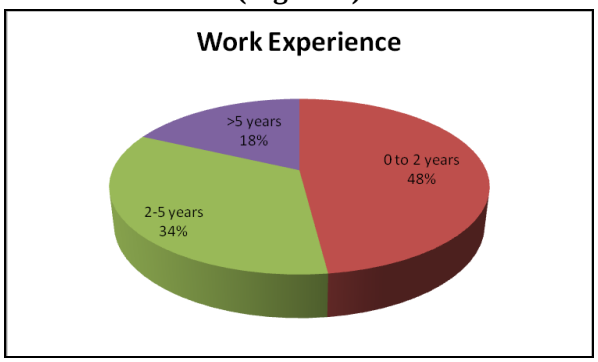
Patient safety culture in any organization is built by all the employees of the organization, irrespective of the years of experience they hold or gender or their department or designation. The patients should feel equally valued by each employee of the hospital. Hence, in this study analysis of patient safety culture has been based on the following factors:

- Availability of human resource to handle given workload
- Team Work
- Leadership
- Learning environment
- Reporting of events
- Communication and coordination

The respondents include Pharmacists, Laboratory Technicians, Imaging Technicians and Nursing staff who have been working with the hospital for ≥ 6 months. Figure 1 and 2, show the distribution of respondents on the basis of their gender and work experience. 63% of the respondents are females and 37% are male whereas on based on work experience, majority of the respondents i.e. 48% have less than 2 years of experience whereas, 34% of them have 2 to 5 years of work experience.



(Figure 1)



(Figure 2)

On analysis of the questionnaire, it was found that though the opinion about sufficient number of staff to handle workload varied among the respondents but almost 54% of them feel that their work units do not have sufficient number of staff to handle the workload effectively (**figure3**).

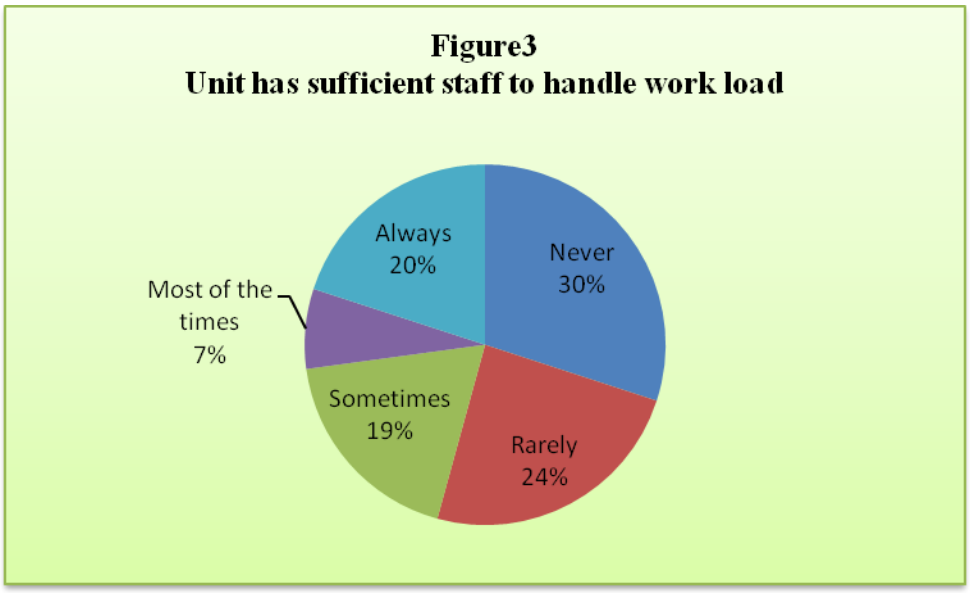


Figure 4, shows that almost 57% respondents feel that their unit is very supportive and works as a team when required. They also have a respectful attitude towards each other. Except a few, in view of the majority (57%), all the employees in a unit come forward and share responsibilities during peak work hour, hence they know the importance of working together and thus keep no boundaries when it comes to serving patients.

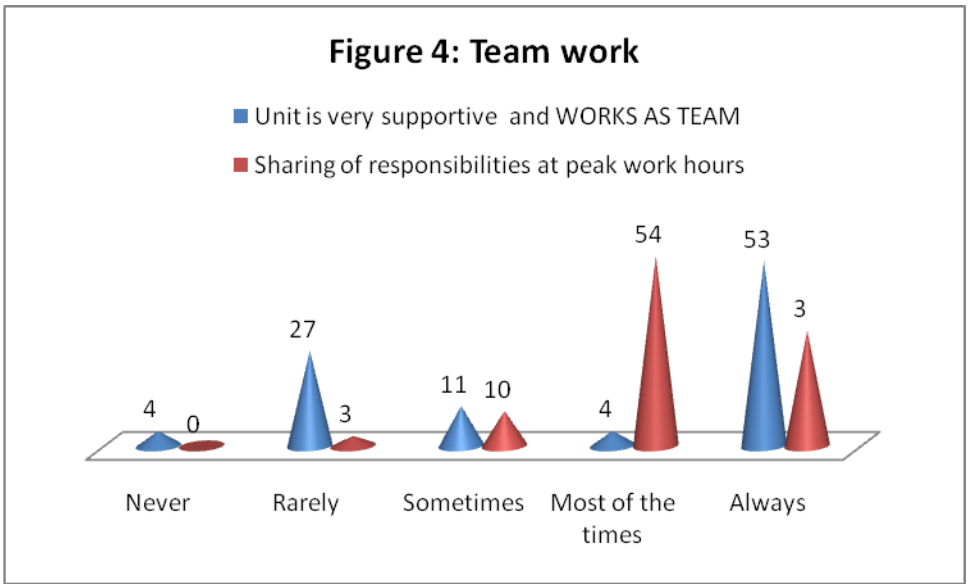
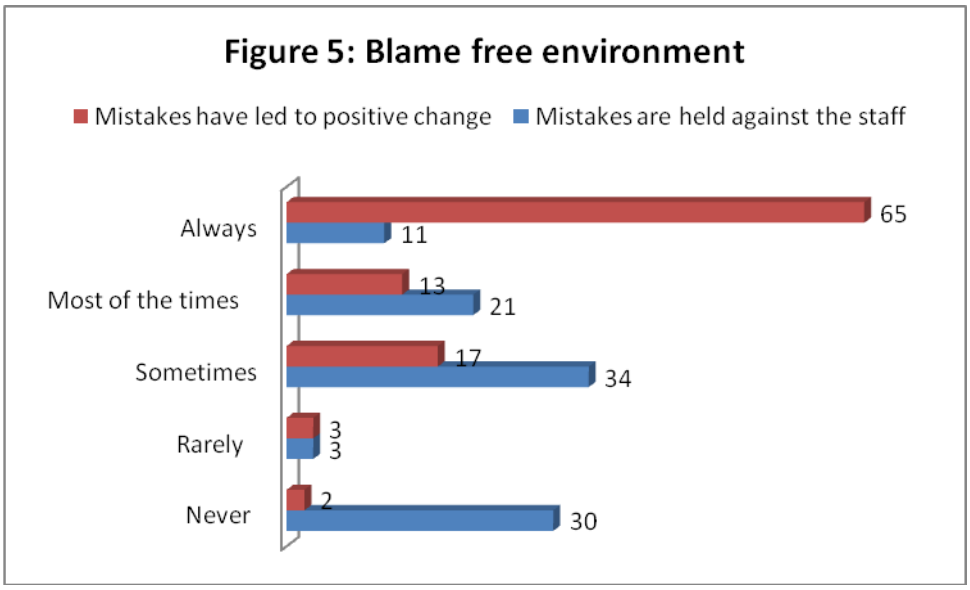


Figure 5, clearly depicts that the work units do not have a totally blame free environment as almost 34% of the respondents have brought to notice that sometimes mistakes are held against the staff but at the same time 86% of them have accepted that mistakes have always led to a positive change amongst the unit staff. This may be due to the strictness of the unit in-charges or management. Hence, this show a lack of encouragement for the staff to come out and share their mistakes openly, therefore decreasing the opportunity to learn from own and others mistakes.

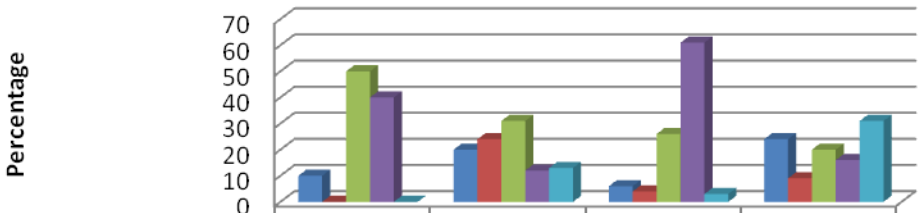


The analysis of questions related to the unit/ work area supervisors or managers (Figure 6) revealed that the supervisors encourage their staff when they work as per, the patient safety protocols that they are trained in but they are not very welcoming to suggestions on patient safety from the staff, only 31% of the staff feels that sometimes their suggestions are welcomed whereas, 44% of the staff feels that their suggestions are valued either rarely or never.

It is surprising but approximately 64% of the respondents agree that in high pressure situations their supervisors ask them to work fast even if it means a compromise on patient safety. Also the patient safety related problems that happen again and again in the department are (47%) ignored.

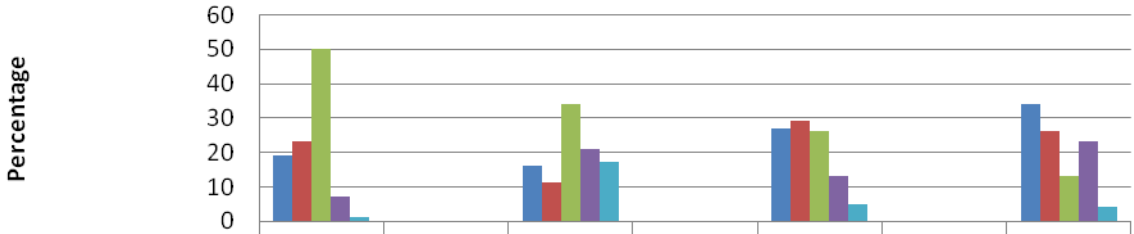
Hence, the departmental in charge do not make an effort to improve patient safety in their respective work areas though the staff is willing to take initiatives and suggest changes needed to improve over all patient safety of their units.

Figure 6: About supervisor/manager



	Appreciation from supervisor	Considers staff suggestions	Take shortcuts, when pressure mounts	Repeated patient safety problems are ignored
Never	10	20	6	24
Rarely	0	24	4	9
Sometimes	50	31	26	20
Most of the times	40	12	61	16
Always	0	13	3	31

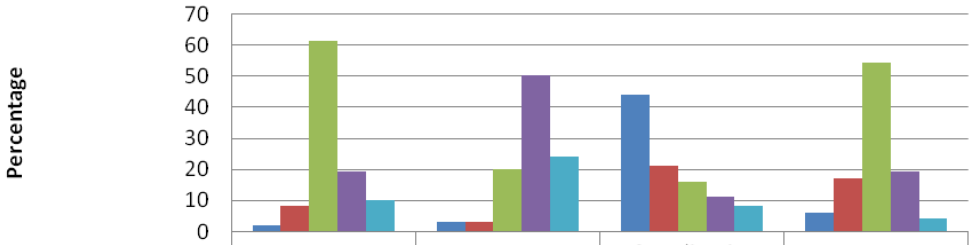
Figure 7:Intradepartmental Communication



	Feedback on changes provided		Communication of errors happening in unit		Freedom to question authority		Fear of questioning
Never	19		16		27		34
Rarely	23		11		29		26
Sometimes	50		34		26		13
Most of the times	7		21		13		23
Always	1		17		5		4

The above figure 7 shows that 50% of the respondents say that feedback regarding any kind of changes related to incident reporting are provided only sometimes and hence many a time such changes are not communicated to all though they are (38%) communicated about errors happening in their units. Almost 55-60% of the respondents feel, they lack the freedom to question decisions of the authority. But when it comes to asking questions, when something does not seem right in context of patient, the staff is not fearful (60%).

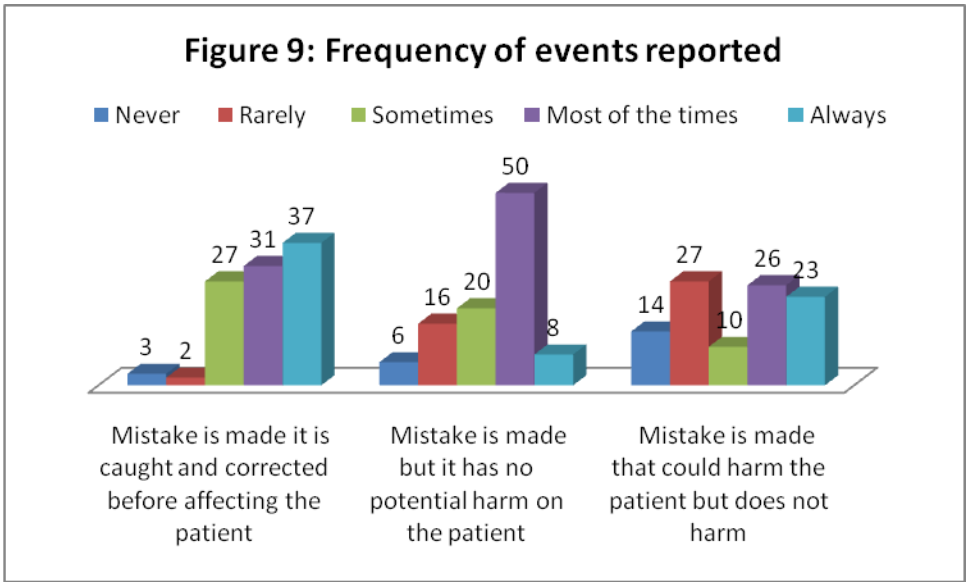
Figure 8: Efforts of management towards patient safety



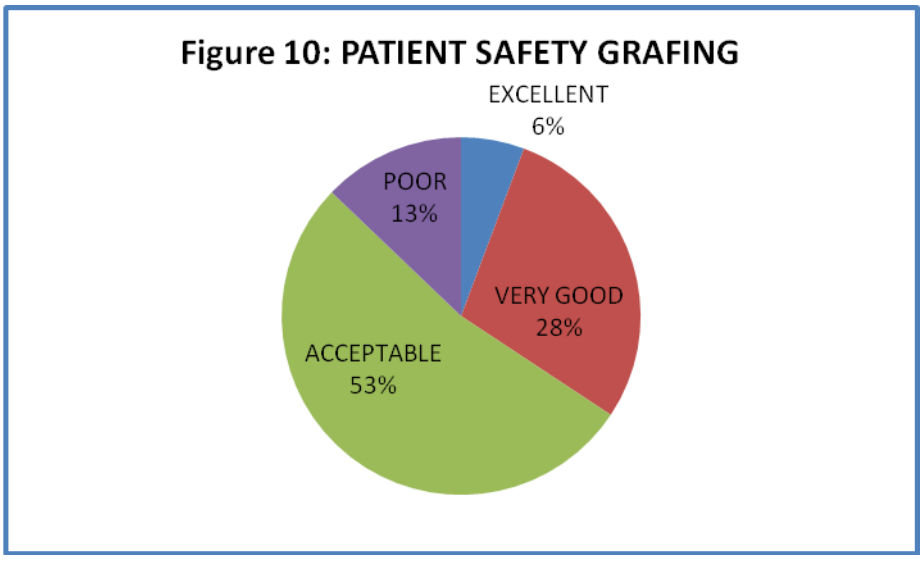
	Training provided on patient safety	Good interunit coordination	Coordination and communication problems while transferring patients	Management takes strict action if patient safety compromised
Never	2	3	44	6
Rarely	8	3	21	17
Sometimes	61	20	16	54
Most of the times	19	50	11	19
Always	10	24	8	4

Patient safety related training is provided sometimes (61%) to the staff and there is no regular ongoing training provided. 74% of the respondents felt that interdepartmental coordination is good. Almost 61% of the respondents negate any coordination and communication problems, while transferring patients from one unit to another. Hence the interdepartmental communication is good and the staff is aware of their responsibilities as they are helpful and supportive.

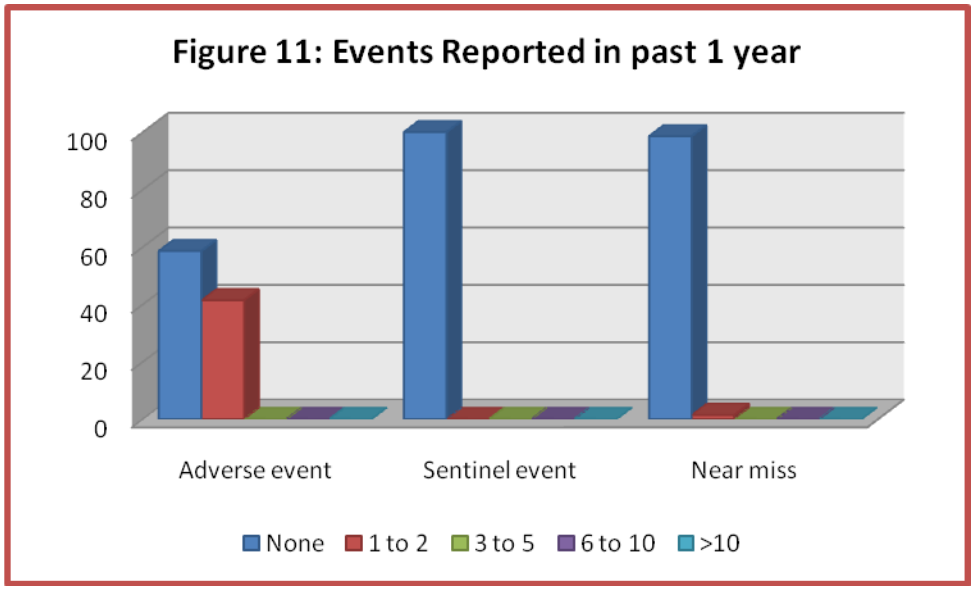
When patient safety is compromised then management takes strict action but only sometimes (54%) depending upon the error or mistake that takes place. Management has a very important role in the way it reacts to mistakes that take place in the clinical departments because it is not necessary that all the errors happen by intention as that is a rare case. Mostly mistakes occur due to fatigue or in hurry due to work pressure. (Figure 8)



On comparison between the response of the above three questions related to frequency of reporting, it was found that the mistakes which are caught are always reported (68%) and mistakes which are made but cause no harm to the patient are reported (58%) but mistakes made but that did not do any harm are rarely reported (49%). This is an indication that the organizational culture has yet not developed to a level where the stakeholders take it as a responsibility to report their mistakes irrespective of the fact that they are a potential threat to patient or not (figure 9).

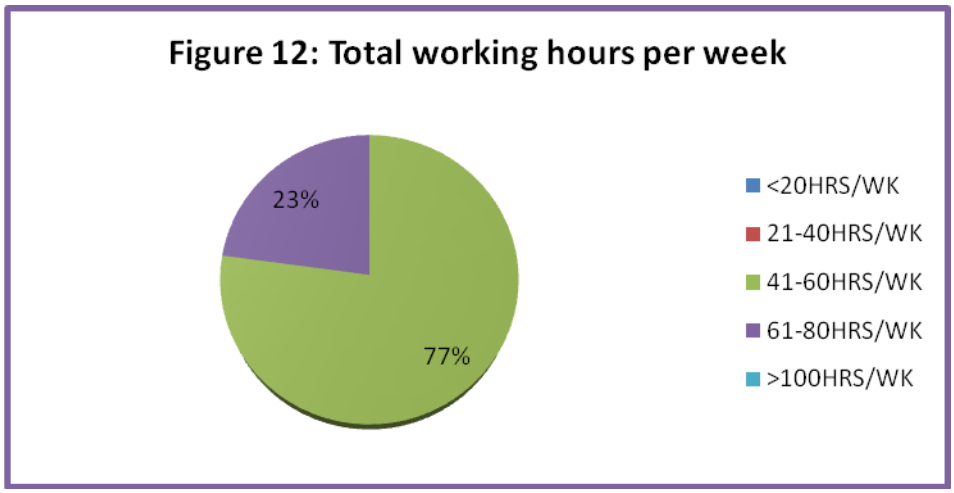


In the opinion of almost 53% of the respondents their units/work areas have only an acceptable level of patient safety hence showing a huge scope of improvement. 28% of respondents have graded their work area very good where as 6% as excellent. But in the opinion of 13% of these people their work area should grade poor, which is alarming indicating a negative state of patient safety culture (figure 10).



There has been no reporting of sentinel event whereas 1-2 near misses have been reported. Almost 41% of the respondents have reported 1-2 adverse events in the

past 12 months. When observations were made across various departments it was observed that in General ward (Pre operative-Female) and Laboratory, incident reporting records are not maintained properly, the reasoning given is lack of staff in respective departments. (Figure 11)



77% of the respondents' work almost 41-60 hours/week i.e. minimum 6 hours/day to maximum 10 hours/day during 6 working days which is an acceptable limit. (Figure12)

3.2 Facility Risk Assessment:

Table 3.1: FMS CHECKLISTS

FACILITY SAFETY CONCERNS FOR PATIENTS				
S.no.	1. General Safety	Yes	No	N/A
1	Are the elevator(s) inspection certificates up to date?			
2	Are the elevator(s) functioning properly?			
3	Is the No-objection certificate put up in every elevator that is in use?			
4	Does the hospital have a designated lift for patient use only?			
5	Is regular preventive maintainenace done for lifts			
6	Is patient furniture in good and safe condition?			
7	Are work areas free of tripping hazards? Example: cords/wires, free standing electrical fixtures?			

1.1. Under the AP govt. rules & regulations lift certification is not a statutory requirement.

1.4. One lift is dedicated to patient use only but patients are even transferred across floors through other lifts as well. Hence a partial compliance.

S.NO.	2. Fire & Electrical Safety	Yes	No	N/A
1	Is an adequate number of portable fire extinguishers provided so that they are readily accessible in the case of an emergency?			
2	Are portable fire extinguishers mounted, located and easily identifiable?			
3	Are portable fire extinguishers visually inspected each month? (inspection cards)			
4	Are annual maintenance checks of portable fire extinguishers completed and does inspection tag on each extinguisher reflect the date completed? Date of most recent check: 19th Feb'2010			
5	Are all fire alarms functioning properly and tested annually? Date of most recent test: Jan '2011			
6	Are planned and unplanned fire drills conducted at regular intervals? Date of most recent drills: April'2010			
7	Are electrical outlets adequate in number (are any extension cords used)			
8	Are electrical panels labelled properly and free of defects?			
9	Are emergency and exist routes identified?			
10	If Yes, are emergency and exist routes clearly marked and functioning properly?			
11	Are means of egress (hallways & sairways) continually maintained free of all obstructions or impediments?			

12	Are stairways well lighted, stairways & handrails in good condition?			

3.1 Out of the total 82 portable fire extinguishers in the hospital only 42 have been mounted. During facility round 4 fire extinguishers were identified which were kept on the floor.

3.2 As per the hospital policy, fire extinguishers are checked on annual basis.

3.3 Annual maintenance check for fire extinguishers is pending by 2 months

3.4 The fire alarms are tested once in every 2 months. Pending by over 1 month

3.5 Was last conducted by Rama Krishna Safety 1 year back

3.6 The electrical panels are labeled properly but problems exist with change over panel (minor problem)

3.7 Emergency and exit routes are not identified for emergency escape.

S.NO.	3. Housekeeping Safety	Yes	No	N/A
1	Are all floors clean and, slip resistant and good repair?			
2	Are warning signs provided when floor is wet?			
3	Are restroom facilities clean and sanitary?			
4	Are restroom facilities adequately stocked with the necessary supplies?			
5	Are drinking water supplies and outlets cleaned regularly?			
6	Are waste receptacles emptied regularly? Frequency is _____			

3.1. All the floors are clean and slip resistant except on the 2nd floor at the entrance to the lift, a small elevation in the floor leads to people suddenly loosing balance and tripping. This should be grounded.

3.2. Warning signs are not used by housekeeping when the floor is wet.

S.No.	4. Maintenance	Yes	No	N/A

1	Are windows unbroken and free from any type of damage?			
2	Do all the windows have grills?			
3	Are doors & locks in good working condition?			
4	Do patient toilets have grab bars?			
5	Do all the wheelchairs and stretchers have safety belts?			
6	Does the hospital have a separate toilet for Handicapped patients?			

1.2 The window grills for Paid General Ward are not present.

4.4Toilets for patients do not have grab bars throughout the hospital.

4.6 Presently, the hospital does not have a handicapped patient's toilet.

3.3. Gap analysis for Departments of Pharmacy, Imaging, and Laboratory as per the NABH standards

To conduct a gap analysis of the above mentioned departments as per NABH Standards, the procedures in each department were mapped for Out-patients and In-patients. Following this NABH standards which have direct relevance to the three departments were listed down and the through partially structured interviews and observations of processes, records and physical facility.

This exercise will help us to compare the existing standard operating procedure of relevance to Patient Safety in the hospital Laboratory, Imaging and Pharmacy departments with the standard operating procedure of NABH.

Please refer to **(annexure 6)** of the report for framework of NABH gap analysis. The gap analysis was done after consulting the department in-charges of Pharmacy, Laboratory and Imaging and Quality. Scoring of the standards and objective elements was done based on the self assessment tool kit of NABH. (Remark: The gap analysis scores have not been shown due to privacy issues of the organization)

3.3.1 Pharmacy processes:

To understand the processes of the hospital pharmacy for both out and in-patients, their flow has been mapped as follows.

Figure 13: Processes for out-patient pharmacy

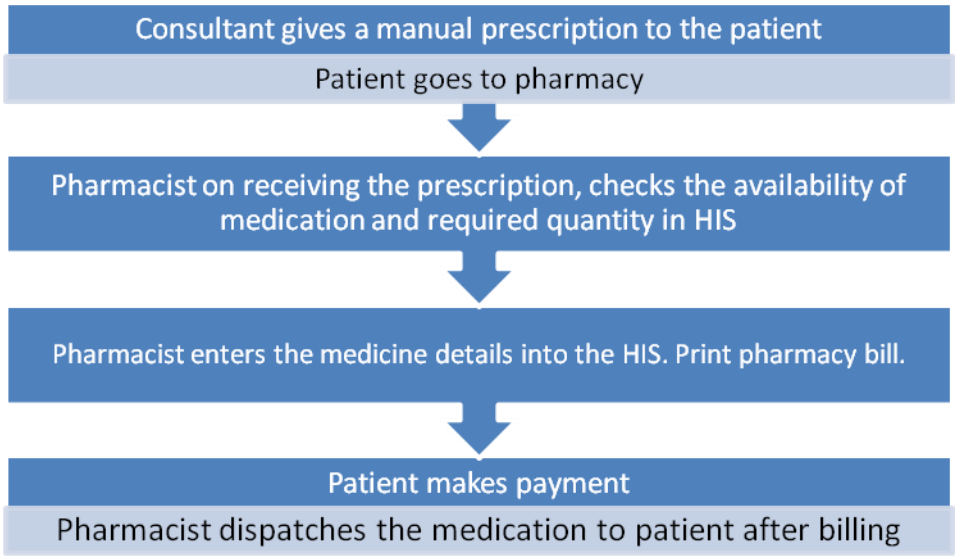
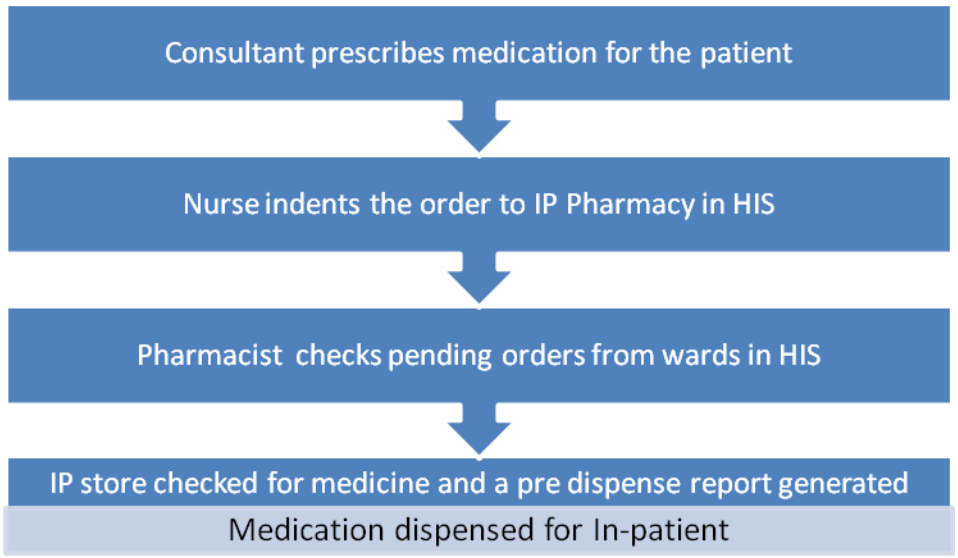


Figure 14: Processes for in-patient pharmacy



Following observations were made in the Pharmacy Department:-

1. The Pharmacy provides the services which commensurate with the services provided by the organization.
2. The Pharmacy staff is well qualified and experienced for performing job, but less in number and hence they are unable to maintain data.
3. The organization has polices & procedure for storage, dispensing, prescription and administration of medication,
4. OP Pharmacy is open 24*7
5. IP Pharmacy is functional from 8:00am to 8:00 p.m. But by May'2011 it will become functional 24*7.
6. Multidisciplinary committee is formed and will become functional from 6th May'2011.
7. Hospital formulary is drafted and is yet to be approved by the multidisciplinary committee
8. Look alike sound alike medication list is available but these drugs are not stored separately.
9. Incident reporting forms are not available in the department. No record maintained.
10. Medications are well protected from theft and loss due to restricted entry in the pharmacy and also frisking is done by the security to keep a check on theft of medication.
11. Narcotic drugs are not kept under lock and key in both OP and IP pharmacies.
12. Labeling requirements are not implemented.
13. Drugs are stored in the pharmacy on shelves according to their trade names rather than generic names.
14. Training about the policies, procedures and patient safety are not provided to the pharmacy staff.

3.3.2 Investigation process:

To understand the investigation process of the hospital, both out and in patients. The flow has been mapped as follows:

Figure 15: Investigation procedure for out-patients

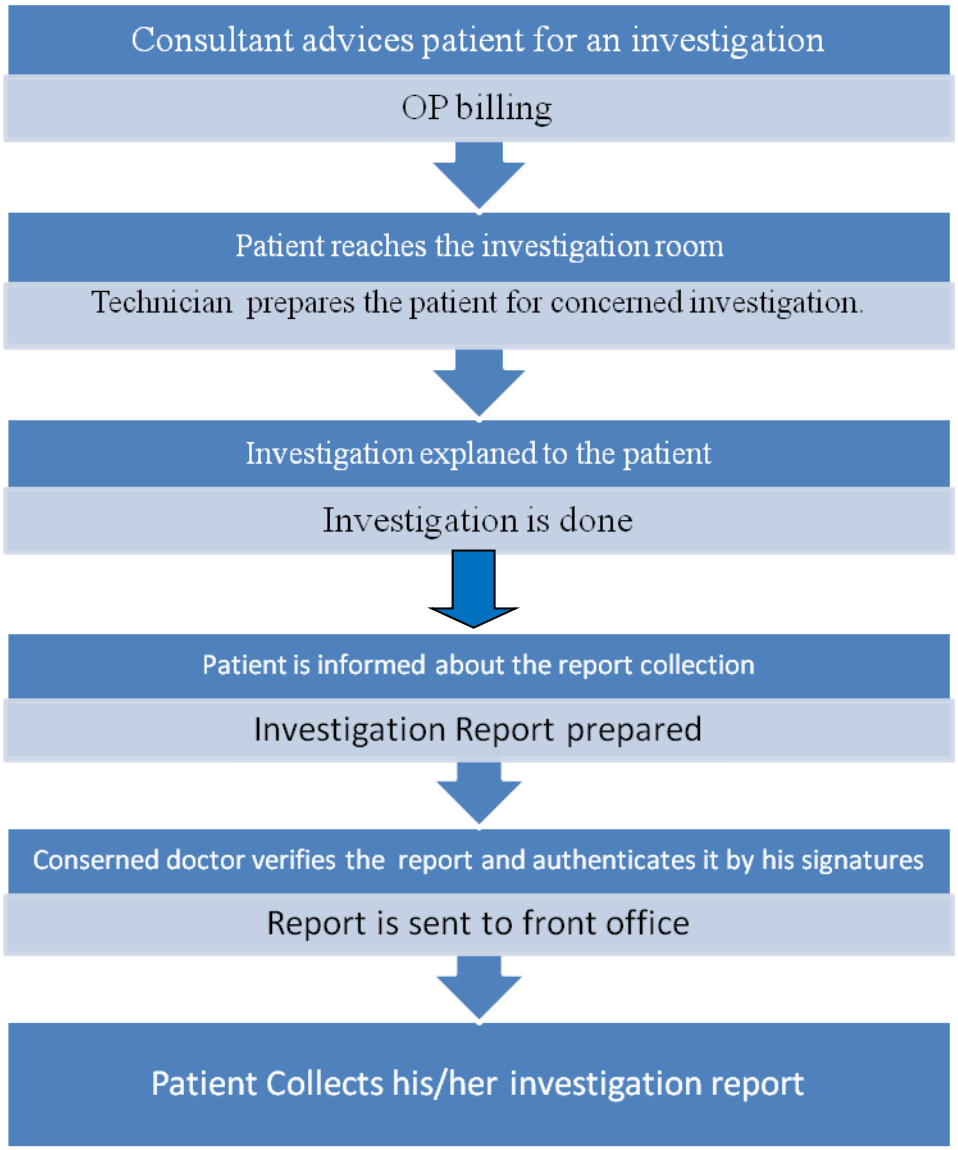
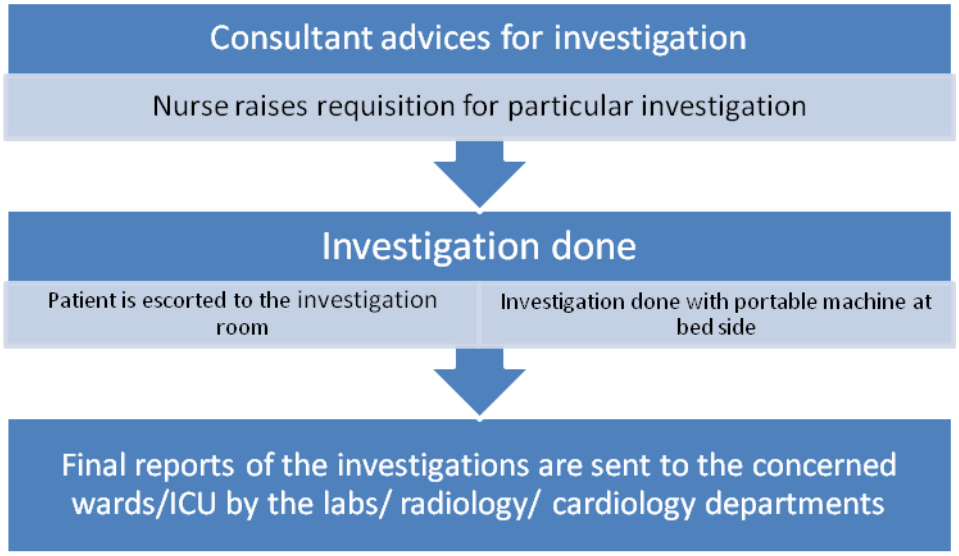


Figure 16: Investigation procedure for in-patients



Following observations were made in the Laboratory Department:

1. The laboratory provides the services which commensurate with the services provided by the organization.
2. The laboratory staff is well qualified and experienced for performing job, but less in number and hence they are unable to maintain data.
3. The organization has polices & procedure for collection , identification & safe disposal of specimen but there is not proper processing, handling, safe transportation specially when sample comes from the wards.
4. Lab reports are mostly late because of less number of staff and some coordination & communication issues.
5. The critical results are immediately informed to the concerned doctor verbally or written on a paper but there is no documentation of critical results.
6. Some of the laboratory tests are out sourced to other labs which assure quality service.

7. The laboratory quality assurance program is under process.
8. The program does not addresses verification and validation of test methods.
9. The program does not address surveillance of test results.
10. Maintenance is done but stickers are not available on most of the machines in lab.
11. Calibration done only when there is wrong value occurs.
12. There is documentation of corrective and preventive action, but not maintained properly.
13. The laboratory safety program is not documented.
14. The laboratory staff follows the standard precautions like disposal of waste according to biomedical waste management and handling rules.
15. The laboratory staff is provided with all the safety devices & equipments but is not trained in patient safety practices.

Following things were observed in Imaging Department:

1. The imaging services commensurate with the services provided by the hospital.
2. All staff working in imaging department is well qualified and experienced.
3. There are policies & procedure to guide identification and safe transportation of patient.
4. The results of imaging services are available within 2 hrs after the procedure.
5. Critical results are not maintained.
6. Imaging services are outsourced on basis of quality assurance from the imaging centers.
7. The quality assurance program for imaging services is under process
8. A document for verification and validation of imaging methods is not available.

9. In charge of department does not assess the imaging results.
10. Calibrations done after one year and preventive maintenance done once in 6 months but stickers are not available on some machines.
11. There is a documentation of corrective and preventive action.
12. The radiation safety program is in under process.
13. The written polices & procedure that guide the handling and disposal of radio- active and hazardous materials, are under process.
14. The imaging staff is provided with appropriate radiation devices e.g. lead aprons which is not used instead the radiographer stands behind the lead shield.
15. Radiation safety devices not checked, but TLD badges sent for assessment after every 3 months.
16. The personnel are trained for radiation safety measure but a continuous training schedule is lacking.
17. Adequate imaging signage are not put where ever necessary ,like “RADIATION ZONE"

Chapter 4

Discussion

Objective 1: To study the patient safety culture in the clinical departments of the hospital.

Patient safety culture depends on the personal interest, attention and engagement of each staff member involved in delivering health services, so efforts to promote a patient safety culture must continue targeting individual staff members.

Though in the opinion of majority of the respondents, the units never have sufficient staff to handle the existing workload but with high team spirit and respect for each other, the staff shares responsibilities during peak hours by sharing work and since they are dedicated to their job, they even work beyond shift timings if needed. The staff is internally motivated to deliver highest quality patient care. All the units in the hospital work well together to their highest capability for best patient care. The interdepartmental as well as intradepartmental relations are cordial and the staff is always willing to work with individuals from other departments without any inhibitions. It is insured that information is kept safe while patient transfer. At times the staff faces some communication and coordination problem but it is manageable but should be further improved upon. During the survey it was identified that feedback is provided by the seniors and top management only when very serious mistakes occur thus limiting the opportunity to learn from own and others mistakes. Restricted feedback or lack of it constricts the opportunity of the employee to learn. This leads to increase in patient unsafe practices being followed. The department supervisors should insure to keep communication loop complete with a feedback provided for every positive as well as negative outcome. This will help reduce harm caused by mistakes as people will be able to quickly recognize the adverse event and take timely

actions. This will help maintain interest and involvement of the frontline staff who is dealing with the patients, directly.

Staff is shy of sharing if mistakes are done which lead to no harm due the fear of being written off. Mistakes are not reported until it is caught or which has no potential harm on the patient. Though the laboratory does have a record book for incident reporting, correct complete records are not entered. In the wards proper records were maintained but on brief discussion with some of the supervisors it was discovered that the incidents are reported only when a mistake is brought to notice. Departments like pharmacy and imaging do not have an incident reporting form or record book. Overall, due to the fact that the hospital does not ensure proper maintenance of incident reporting registers or forms in various departments, it could not be ascertained whether there were no medical errors or mistakes though majority of the staff had not reported any event in the past one year. Also there are no clear guidelines as to the action to be taken once an error occurs.

Leadership though good, lacks an open communication to some extent. The top management should make slight changes in its leadership style. Due to the authoritarian style of management, majority of the respondents are fearful when it comes to questioning the decisions of the authority. The encouragement for the frontline staff to share ideas related to patient safety and other quality measures, and hence raise the patient safety bar for their respective units is lacking. The supervisors need to perform their duty to develop the staff under their supervision by providing continuous training sessions on various issues related to the work area which is an integral part of the departmental processes. Also they need to be a part of the communication route to educate the unit staff to learn from the past events so that awareness levels of staff increases about the possible medical errors

that can take place and then work out the ways by which it can be avoided in the future.

Sexton, et al. [9], has previously indicated that there probably are hospital-specific patient safety cultures. As this work pertains to one hospital only (Narayana Hrudayalaya Malla Reddy Hospital), empirically the amount of clustering of safety attitudes at the hospital level could not be checked.

Objective 2: Develop a checklist for future use and identify gaps in facility safety.

The facility design of the hospital, with its equipment and technology, has not been investigated extensively while studying the quality and safety of patients especially in Indian context. Organizational/system factors that can potentially create the conditions conducive for errors are called latent conditions. Specific examples of a latent condition effecting patient safety would be the impact of low lighting levels in the medication dispensing areas, absence of fire exit routes especially in inpatient wards etc 5. By targeting human factors through facility design and its management, this study aims to ensure that latent conditions that lead to adverse event are minimized to improve patient safety in the hospital.

In the footsteps of the Institute of Medicine's report highlighted in literature review [9] gap analysis was carried out on facility management. It has been observed that there is a lack of sufficient space to accommodate family members of the in-patients and absence of clearly marked signs to navigate the hospital. This indicates lack of Patient-centeredness, in the hospital facility. In terms of safety, there are problems associated both with lift management and fire safety maintenance. Out of three lifts available in the hospital, one is earmarked as "only for patient's use". But, the housekeeping staff working as general duty assistants in helping patients' to move from the wards to radiological investigations, utilize the lift ear marked for waste management for transferring the patients. This exposes the patient to a greater risk of hospital acquired infections. A clear communication should be made to

all the concerned departments and staff that an in-patient whether in CCU or General ward, critical or stable should always be moved in the patients' lift.
The preventive maintenance of fire and electrical safety are pending over by 1-2 months, when asked the reason for the same the department in charge explained that due to lack of an AMC and lack of staff, the department is unable to fulfill its commitments of timely maintenance. The maintenance department should have an annual maintenance contract in place as soon as possible so that a proper preventive maintenance plan can be made and strictly monitored once implemented. Also, fire safety training should be conducted on regular basis, once in 6 months and mock drills should be conducted. The hospital needs to develop a disaster management committee and plan to effectively tackle disastrous situations.

Warning signs "floor is wet" should be put up when mopping the floor so that patients who are ambulatory can be careful while walking. The floors which are sharp or damaged should be listed and communicated to maintenance department so that proper grounding or repair work can be done to avoid patient and provider injuries. Grab bars should be installed in each patient toilet and a separate toilet should be built for handicapped patients especially in the out-patient department to avoid patient falls and improve safety. For this, even an existing toilet can be converted into a handicapped toilet if the facility design does not allow building a new toilet due to space scarcity. Facilitating hand washing with the availability of sinks and alcohol hand rubs in sufficient numbers at appropriate locations (bedside) is another aspect of safety that is less than required minimal standards. It was visually observed that the other 4 qualities viz., effectiveness, efficiency with respect to room layout of equipments, timeliness in ensuring rapid response to patient needs and equity are maintained to a level. A detailed analysis of the same has not been carried out due the shortage of time during the study.

Objective 3: To compare the existing standard operating procedure of relevance to Patient Safety in the hospital laboratory, Imaging and pharmacy departments with the standard operating procedure of NABH.

NABH accreditation system is one of the methods for commitment to quality enhancement throughout the whole of the health care system in India. It involves all professional and service groups to ensure that high quality in health care is achieved, while minimizing the inherent risks associated with modern health care delivery. The hospital is currently undergoing steps to get NABH certification. Current policies and processes are inadequate to ensure health care services of acceptable quality and prevent negligence since the policies and procedures for departments of Pharmacy, Laboratory and Imaging as per NABH standards, are being developed by the quality department at the hospital. The various committees though formed, have not started meeting. Once approved by their respective committees the policies and procedures as per NABH standards will be implemented, which would fill up the existing gaps. It is also important that simultaneously the management provide regular training to the staff through change agents who should have effective communication skills and leadership qualities, regarding the policies and the procedures to be adopted so that they make a deep impact on the hospital staff and slowly progress them to change their behavior and attitude towards patient care and thus patient safety.

Chapter 5
Conclusion

Narayana Hrudayalaya Malla Reddy Hospital, Hyderabad, a multi super specialty hospital was commissioned in February, 2010. Though one year old in the Hyderabad healthcare industry, the management is gearing up to prepare itself for NABH Accreditation, itself justifies Management's vision to provide the highest quality care at minimum cost to serve the masses.

This report will help to bring management's attention to certain important issues related to patient safety. The hospital is still in the process of developing and implementing the standardized procedures in all the departments of the hospital as per NABH Standards Manual. With dedicated efforts, management will be able to raise its patient safety bar. The current status of patient safety at the hospital is acceptable and requires further continuous quality improvement.

Some of the most critical causes that have presently compromised patient safety in Narayana Hrudayalaya Malla Reddy Hospital are as follows:

1. Lack of Training
2. Improper information sharing
3. Lack of feedback mechanism
4. Lack of strict monitoring of facility safety.
5. Absence of standardization in processes across departments of Pharmacy, Laboratory and Imaging.
6. Lack of implementation of Patient safety management program.

Strategies for improving patient safety should be tailored for work areas and disciplines not only at organizational unit level but also at individual employee level, with respect to the individual department workflows. The same has been suggested in the recommendation section of this work.

Chapter 6

Recommendations

Some of the important areas of focus are listed below:

1. **Human Resource Management:**

   a) An induction and orientation programme should be conducted for all the new employees who join hospital to help them get oriented to the mission and vision of the organization.

   b) Human resource planning should be revisited in departments of laboratory and if any deficiency in the number of employee(s) exists, it should be corrected on priority.

   c) Recruitment should be done in quality department of the hospital so that work related to NABH pre assessment can be fastened.

   d) A feedback mechanism should be developed so that the communication flow is maintained. (i) A grievance box should be put up on each floor so that complaints of the staff can be handled, if any.

2. Quality Department:

a) All the policies should be designed as per NABH standards. The policies should be approved by respective committees and before implementation should be communicated to the staff of concerned departments.

b) **A patient safety management program** should be developed for the hospital and also a **patient safety management committee** constituted. A **patient safety manual** should be developed by the patient safety committee. This will help to identify potential hazards in the hospital and implement effective measures to eliminate the hazards. Also periodic regular reviews should be conducted by internal and external agencies.

c) A continuous training program for the staff of department of pharmacy, laboratory, imaging and nursing should be conducted on example: training on biomedical waste handling for nurses, lab and imaging technicians,; Medication errors, rate of adverse events in healthcare, theoretical models of human error, how to learn from errors, teamwork and safety leadership. Regular sensitization about the possible errors in the area of patient safety will help develop a culture at the individual and departmental level.

3) Maintenance department:

a) A reflective tape should be put up on slightly elevated surfaces which lead to tripping and difficult to see with naked eyes.

b) Annual maintenance contract should be signed with a reliable agency which can ensure timely preventive maintenance of equipments.

c) A schedule should be prepared for daily/ weekly/ monthly/ quarterly/ half yearly/ annual maintenance depending upon the nature (criticality) of the equipment.

d) A hospital failure mode and effect analysis (FMEA) should be conducted and processes should be redesigned accordingly.

e) Grab bars should be installed in the patient toilets and a separate toilet for handicapped patients should be designed.

4) Top Management:

a) A participative management approach and open communication should be encouraged by the management. This will encourage frontline staff to share their experiences and challenges of their respective work areas.

b) The aim for continuous quality improvement should be communicated by the top management to all the employees down the chain of command. This will help develop a strong organizational culture and thus develop staff that is "patient safety minded."

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ANNEUREXS

Anneure1: TRAINING NEED ANALYSIS

Name of Employee: _____

1) General Information about the current job:
   a) How long have you been working / associated with Narayana Harudayalaya?
      ( ) < 1 month
      ( ) 1-6 months
      ( ) 6 months - 1year

   b) What is your current job?
      ……
      …..

   c) Do you have a job description for your job?

      ( ) Yes ( ) No

   d) Is your job accurately described in your job description?
      ( ) Yes ( ) No

   e) If no, what extra duties do you do that should be added to your job description?.....
      .....
      .....

   f) What duties are not part of your current job and can be deleted from your job
      description?.....
      .....
      .....

2) Specific questions regarding current job:
   a) Describe the tasks you regularly perform that are critical to carrying out your job effectively
      ……
      ……
      ……

b) Describe the type of equipments or machines you are required to use as part of your job (for example: keyboard, Xerox machine, etc.)
   (i) …….
   (ii) ……
   (iii) ……...
   (iv) ……

c) Do you feel that a high degree of technical knowledge is required for your job?
   ( ) Yes ( ) No

d) Your current job requires you to work as follows:
   ( ) Alone ( ) In a team
   ( ) Others……..

e) If you work as part of a team, do you perform the same work as other team members?
   .....
   .....

f) Your job requires you to work closely with which of the following:
   ( ) Patients
   ( ) Doctors
   ( ) Administrative staff
   ( ) Nurses
   ( ) All of the above
   ( ) Others (please specify)
   …….

g) To what extent you are required to work closely with other people in your organization?
   ( ) very little ( ) moderately ( ) a lot

h) How much autonomy is there in your job ,ie, to what extent do you decide how to proceed with your work?
   ( ) very little ( ) moderately ( ) a lot

i) To what extent do you do different things at work, using several skills and talents?
   ( ) very little ( ) moderately ( ) a lot

j) What new skill set or training have you acquired in the last 1 year other than that received in the Narayana Harudayalaya?

……
……

3) Your training requirements:
   a) To perform your current job: what training do you still need (either on job or a formal course) to perform your current job competently (eg, Excel, Bookkeeping, English, etc)?

   ……
   ……

   b) To perform other jobs in the hospital: what other roles are you interested in doing if a vacancy became available (eg, coordinator position, etc) ?

   ……
   ……

   c) To perform other jobs in the hospital: what training or experience would be required(eg, machine operation, soft skills, etc)

   ……
   ……

4) Future development requirements:
   a) What do you aspire to become?

   ……
   ……

   b) What do you need to make this happen? (eg, degree, diploma, on job training)

   ……
   ……

Signature of the employee:
Date:

"Test your soft skills": Do you have it in you?

- Good Communicator
- Positive Attitude eg. Cheerful and helpful
- Strong Work Ethic
- Teamwork Skills
- Interpersonal Skills eg. Avoids gossip
- Has Integrity eg. Honest, hard working
- Flexible and Adaptable
- Problem Solver
- Good Self Management eg. Organized, Responsible
- Takes Initiative eg. Offers to take on additional responsibility

Rate yourself on a scale of 1 to 5
1- Lowest
5- Highest

Annexure 2: COPY OF THE CERTIFICATE OF COMPLETION FOR SPOKEN ENGLISH AND SOFT SKILL DEVELOPMENT

Narayana Hrudayalaya Hospitals

Caring with Compassion

Narayana Hrudayalaya - Malla Reddy Hospital

Certificate of Completion

This is to certify that

Mr/Mrs/Ms/Dr .....

has successfully completed the "Spoken English and Soft Skill Development Program" at Narayana Harudayalaya - Malla Reddy Hospital, Hyderabad as part of employee training program from..... to .....

We wish him/her best of luck for all future endeavors

Hanuman Prasad
Chief Operating Officer

Dr. Anil Kumar Mulpur
Vice President & Clinical Director

Annexure 3: WOMEN OF THE DAY PLAN

Annexure 4: SURVEY ON PATIENT SAFETY CULTURE

i) Respondent's Name/Employee code: ……
ii) Gender: ……
iii) Work Experience: ……
iii) Department: …….

Please indicate your agreement or disagreement with the following statements about your unit by tick marking one of the following:

( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(a) Work area:

1. Unit has enough staff to handle the workload
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

2. We work together as a team, my unit is very supportive and treat each other with respect
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

3. During peak work hours, we share responsibilities to work effectively
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

4. Staff in this unit works beyond their shift timings to provide highest quality patient care
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

5. Staff feels that their mistakes are held against them
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

6. Mistakes have led to positive changes here because we take up all mistakes seriously and try to prevent it to happen again
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

7. Patient safety is compromised in our unit
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

8. We try to prevent errors from happening
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(b) Supervisor/manager:

1. When I work according to patient safety standards, my supervisor says a good word to me
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

2. My supervisor seriously considers staff suggestions for improving patient safety
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

3. Whenever pressure increases, my supervisor wants us to work faster, even if it means taking shortcuts
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

4. My supervisor overlooks patient safety problems that happen over and over again
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(c) Communication and coordination:

1. We are given feedback on changes made based on event reporting
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

2. Staff has the freedom to report any activity that may negatively affect patient care
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

3. We are informed about errors that happen in our unit
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

4. Staff feels free to question the decision or actions of those with more authority
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

5. In this unit, we discuss ways to prevent errors from happening regularly

( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

6. Staff is afraid to ask questions, when something does not seem right
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(d) Frequency of events reported (how often are mistakes reported)

1. Mistake is made it is caught and corrected before affecting the patient. How often is this reported?
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

2. Mistake is made but it has no potential harm on the patient. How often is this reported?
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

3. Mistake is made that could harm the patient but does not harm. How often is this reported?
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(e) Patient safety grade – what is your overall grading of your unit on patient safety?

( ) Excellent ( ) Very good ( ) Acceptable ( ) Poor ( ) Failing

(f) About your facility – Narayana Hrudayalaya

1. We are provided regular training on patient safety
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

2. Units in this facility coordinate well with each other
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

3. There is always coordination and communication problems, when transferring patients from one unit to another
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

4. Units which need to work together have good cooperation amongst each other

( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

5. During patient transfer, patient care information is lost
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

6. It is pleasant to work with staff from other units
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

7. If patient safety is compromised, then management takes strict action
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

8. Shift changes are problematic for patients
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

9. Shift changes are problematic for the staff
   ( ) Never ( ) rarely ( ) sometimes ( ) most of the times ( ) always

(g) Number of events you have reported in the past 12 months

1. Adverse events:

( ) None ( ) 1-2 ( ) 3-5 ( ) 6-10
( ) >10

2. Sentinel events

( ) None ( ) 1-2 ( ) 3-5 ( ) 6-10
( ) >10

3. **Near miss events**

( ) None ( ) 1-2 ( ) 3-5 ( ) 6-10
( ) >10

(h) How many hours do you work per week in this facility?

( ) < 20 hours/weeks ( ) 21-40 hours/weeks ( ) 41-60 hours/weeks

( ) 61-80 hours/weeks ( ) 81-100 hours/weeks ( ) >100 hours/weeks

Annexure 5: Facility Safety Checklist

Facility Safety Checklist					
	Safety Concerns				
S.no.	1. General Safety	Yes	No	N/A	Unable to Determine
1	Is the elevator(s) inspection certificates up to date?				
2	Are the elevator(s) functioning properly?				
3	Is the No-objection certificate put up in every elevator that is in use?				
4	Does the hospital have a designated lift for patient use only?				
5	Is regular preventive maintainenace done for lifts				
6	Is patient furniture in good and safe condition?				
7	Are work areas free of tripping hazards? Example: cords/wires, free standing electrical fixtures?				
S.NO.	2. Fire & Electrical Safety	Yes	No	N/A	Unable to Determine
1	Is an adequate number of portable fire extinguishers provided so that they are readily accessible in the case of an emergency?				
2	Are portable fire extinguishers mounted, located and easily identifible?				
3	Are portable fire extinguishers visually inspected each month? (inspection cards)				
4	Are annual maintenance checks of portable fire extinguishers completed and do inspection tags on each extinguisher reflect the date completed?				
5	Are all fire alarms functioning properly and tested annually? Date of most recent test_____				
6	Are planned and unplanned fire drills conducted at regular intervals? Date of most recent drills_____				
7	Are electrical outlets adequate in number (are any extension cords used)				
8	Are electrical panels labelled properly and free of defects?				
9	Are emergency and exist routes identified?				
10	If Yes, are emergency and exist routes clearly marked and functioning properly?				
11	Are means of egress (hallways & sairways) continually maintained free of all obstructions or impediments?				
12	Are stairways well lighted, stairways & handrails in good condition?				

S.NO.	3. Housekeeping Safety	Yes	No	N/A	Unable to Determine
1	Are all floors clean and, slip resistant and good repair?				
2	Are warning signs provided when floor is wet?				
3	Are restroom facility clean and sanitary?				
4	Are restroom facilities adequately stocled with the necessary supplies?				
5	Are drinking watre supplies and outlets cleaned regularly?				
6	Are waste receptacles emptied regularly? Frequency is_____				
S.No.	4. Maintenance	Yes	No	N/A	Unable to Determine
1	Are windows unbroken and free from any type of damage?				
2	Do all the windows have grills?				
3	Are doors & locks in good working condition?				
4	Do patient toilets have grab bars?				
5	Do all the wheelchairs and strechers have safety belts?				
6	Does the hospital have a separate toilet for Handicapped patients?				

Annexure 6: Framework of NABH self assessment tool kit

GAP ANALYSIS: LABORATORY SERVICES					
AAC. 7.	**Laboratory services are provided as per the requirements of the patients.**			**Average score**	
Objective Elements		**Documentation (Yes/ No)**	**Implementation (Yes/ No)**	**Evidence (cross reference to documents/ manuals etc.)**	**Scores (0/ 5/ 10)**
a	Scope of the laboratory services are commensurate to the services provided by the organization.				
b	Adequately qualified and trained personnel perform and/or supervise the investigations.				
c	Policies and procedures guide collection, identification, handling, safe transportation, processing and disposal of specimens.				
d	Laboratory results are available within a defined time frame.				
e	Critical results are intimated immediately to the concerned personnel.				
f	Laboratory tests not available in the organization are outsourced to organization(s) based on their quality assurance system.				
AAC. 8.	**There is an established laboratory quality assurance programme.**			Average score	
Objective Elements		**Documentation (Yes/ No)**	**Implementation (Yes/ No)**	**Evidence (cross reference to docum**	**Scores (0/ 5/ 10)**

				ents/ manuals etc.)	
a.	The laboratory quality assurance programme is documented.				
b.	The programme addresses verification and validation of test methods.				
c.	The programme addresses surveillance of test results.				
d.	The programme includes periodic calibration and maintenance of all equipments.				
e.	The programme includes the documentation of corrective and preventive actions.				
AAC.9	There is an established laboratory safety programme.			Average score	
Objective Elements		Documentation (Yes/ No)	Implementation (Yes/ No)	Evidence (cross reference to documents/ manuals etc.)	**Scores (0/ 5/ 10)**
a.	The laboratory safety programme is documented.				
b.	This programme is integrated with the organization's safety programme.				
c.	Written policies and procedures guide the handling and disposal of infectious and hazardous materials.				
d.	Laboratory personnel are appropriately trained in safe practices.				
e.	Laboratory personnel are provided with appropriate safety equipment/ devices.				
e.	Laboratory personnel are provided with appropriate				

	safety equipment/ devices.				

GAP ANALYSIS: IMAGING SERVICES

AAC. 10.	Imaging services are provided as per the requirement of the patients.			Average score	
Objective Elements		**Documentation (Yes/ No)**	**Implementation (Yes/ No)**	**Evidence (cross reference to documents/ manuals etc.)**	**Scores (0/ 5/ 10)**
a	Imaging services comply with the legal and other requirement.				
b	Scope of the imaging services are commensurate to the services provided by the organization.				
c	Adequately qualified and trained personnel perform, supervise and interpret the investigations.				
d	Policies and procedures guide identification and safe transportation of patients to imaging services.				
e	Imaging results are available within a defined time frame.				
f	Critical results are intimated immediately to the concerned personnel.				
g	Imaging tests not available in the organization are outsourced to organization(s) based on their quality assurance system				
AAC. 11.	**There is an established quality assurance programme for imaging services.**			**Average score**	

Objective Elements		Documentation (Yes/ No)	Implementation (Yes/ No)	Evidence (cross reference to documents/ manuals etc.)	Scores (0/ 5/ 10)
a.	The quality assurance program for imaging services is documented.				
b.	The programme addresses verification and validation of imaging methods.				
c.	The programme addresses surveillance of imaging results.				
d.	The programme includes periodic calibration and maintenance of all equipments.				
e.	The programme includes the documentation of corrective and preventive actions.				
AAC. 12	**There is an established radiation safety programme.**			**Average score**	
	Objective Elements	**Documentation (Yes/ No)**	**Implementation (Yes/ No)**	**Evidence (cross reference to documents/ manuals etc.)**	**Scores (0/ 5/ 10)**
a.	The radiation safety programme is documented.				
b.	This programme is integrated with the organization's safety programme.				
c.	Written policies and procedures guide the handling and disposal of radio-active and hazardous materials.				

d.	Imaging personnel are provided with appropriate radiation safety devices.				
e.	Radiation safety devices are periodically tested and documented.				
f.	Imaging personnel are trained in radiation safety measures.				
g.	Imaging signage(s) are prominently displayed in all appropriate locations.				
h.	Policies and procedures guide the safe use of radioactive isotopes for imaging services.				

GAP ANALYSIS: PHARMACY SERVICES					
MOM .1.	**Policies and procedure guide the organization of pharmacy services and usage of medication**			**Average score**	
Objective Elements		**Documentation (Yes/ No)**	**Implementation (Yes/ No)**	**Evidence (cross reference to documents/ manuals etc.)**	**Scores (0/ 5/ 10)**
a.	There is a documented policy and procedure for pharmacy services and medication usage				
b.	These comply with the applicable laws and regulations				
c.	A multidisciplinary committee guides the formulation and implementation of these policies and procedures				
MOM .2.	**There is a hospital formulary**			**Average score**	
The hospital formulary draft has been developed and is awaiting approval from the multidisciplinary committee					

MOM .3.	Policies and procedures exist for storage of medication			Average score = 6.85	
Objective Elements		Documentation (Yes/ No)	Implementation (Yes/ No)	Evidence (cross reference to documents/ manuals etc.)	Scores (0/ 5/ 10)
a.	Documented policies and procedures exist for storage of medication				
b.	Medications are stored in a clean, well lit and ventilated environment				
c.	Sound inventory control practices guide storage of the medications				
d	Medications are protected from loss or theft				
e	Sound like and look alike medications are stored separately				
f	There is a method to obtain medication when the pharmacy is closed				
g	Emergency medications are available all the time				
h	Emergency medications are replenished in a timely manner when used				
MOM .5.	Policies and procedures guide the safe dispensing of medication			Average score	
Objective Elements		Documentation (Yes/ No)	Implementation (Yes/ No)	Evidence (cross reference to documents/ manuals etc.)	Scores (0/ 5/ 10)

a.	Documented policies and procedures guide the safe dispensing of medications				
b.	The policies include a procedure for medication recall				
c.	Expiry dates are checked prior to dispensing				
d	Labeling requirements are documented and implemented by the organization				