

A Report on
“ANALYSIS OF RE-ADMISSIONS WITHIN 15 DAYS – PAN MAX”

At

MAX HEALTHCARE, DELHI

Submitted by “RAGHAV ARORA”

Of

Post –Graduate diploma in Hospital & Health Management

PGDHM 2011-2013 Batch

As a partial fulfillment of the Summer Training requirement

Of PGDHM Program

(2nd April – 1ST June 2013)

CERTIFICATE FROM THE INDUSTRY GUIDE



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CERTIFICATE

TO WHOM SO EVER IT MAY CONCERN

This is to certify that **Dr. RAGHAV ARORA**, PGDHM student from Institute from Health Management and Research, Jaipur underwent summer internship at Max Healthcare, New Delhi from 2nd April, 2013 to 1st June, 2013. Further this is to certify that he has successfully completed his projects titled:

- a) "Analysis of Re-admissions within 15 days – PAN Max"
- b) "Antibiotic Monitor Tool – PAN Max"

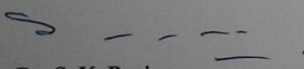
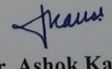
He was also a member of audit team for Internal Audit at Max Hospital, Mohali (Punjab)

To the best of our knowledge, the study mentioned above is his original work.

A handwritten signature in black ink, appearing to read 'Arati Verma', is written over a horizontal line.

Dr. Arati Verma
Senior Vice President - Medical Quality
Max Healthcare Institute Ltd.
Saket, New Delhi

CERTIFICATE BY THE MENTOR

E-mail : ihmr@ihmr.org URL : http://www.ihmr.org Gram : HEALTHINST	
<u>CERTIFICATE</u>	
This is to certify that Dr. Raghav Arora, Regd. No. IIHMR/PGDHM/2012-14/17-1360, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management Research, Jaipur- 17th Batch has undergone summer training in Max Super Specialty Hospital, Saket and has successfully completed his projects titled :	
a) " Analysis of Re-admissions within 15 days – PAN Max" b) "Antibiotic Monitor Tool – PAN Max "	
The candidate has successfully carried out the mentioned study assigned to his during the summer training from 2th April 2013 to 1th June 2013 and he was also the member of audit team for Internal Audit at Max Hospital, Mohali (Punjab). His approach to study has been sincere, scientific and analytical.	
We wish him success in all his future endeavors.	
 Dr. S. K. Puri Academic Advisor& Mentor, IHMR, Jaipur	 Dr. Ashok Kaushik Dean, Academic & Student Affairs IHMR, Jaipur

ACKNOWLEDGEMENT

“A Great achievement solution dawns with an idea, grows with our effort and attains fulfillment with our will power”. In our effort towards the realization of my project work, I have drawn on the guidance of many people for which I’m glad to acknowledge.

I got the opportunity to pursue my Dissertation from Max Healthcare, New Delhi. It was an opportunity to work with one of the best health care service providers.

I would like to thank my mentor & guide **Dr. Arati Verma**, Senior Vice-President, (Medical Quality & Education), Max Healthcare, New Delhi for providing an opportunity to carry out the project work and utilizing the facilities available. Without her valuable guidance and consistent support, this project would not have got underway.

I am also grateful to **Dr. Neha Chandra** Sr. Manager – Education, Max Healthcare, New Delhi and **Dr. Vibha Jain**, Manager- IT, Max Healthcare, New Delhi for their consistent guidance and support during the analysis of the data.

I also express my gratitude towards the staff of the hospital, which has helped me a lot in successful completion of my project.

I’m grateful to my mentor **Dr. S.K. Puri**, Academics Advisor, IIHMR & **Dr. Ashok Kausik**, Dean, Academics & Student Affairs for their co-operation, help and wholehearted encouragement. Her assistance enabled me, to overcome many obstacles during the work of my project study.

I’m also thankful to all those who have directly or indirectly encouraged me to complete this project.

EXECUTIVE SUMMARY

The title of the project is “Six Sigma Approach to Reduce Re-Admissions within 15 Days – Pan Max”. This project work has been undertaken for the successful completion of Six Sigma Green Belt. It was conducted by Dr. Raghav Arora, student of IHMR-Jaipur, 2012-2014 Batch under mentorship of Dr. Arati Verma Sr. Vice President (Medical Quality& Education), Max Healthcare. Any unhealthy patient retuning back to the hospital within 15 days of discharge as an unplanned admission is referred as “Re-admission” and is considered as a defect in treatment planning. The project is primarily a comparative study of discharged patients and their level of risk for readmissions within 15 days after discharge in Max Hospitals.

The data derived from all Max hospitals (PAN Max) is collected as primary data. Various literatures were considered including 2007 & 2008 Med Pac Reports till 2012 JAMA Internal medicine study and accordingly the suggested variable of JAMA Internal medicine study was assessed and the problems/defects or issues of concern were drawn. The defects were analyzed at broader level and sigma rating at PAN Max and at different hospitals was derived. The level was conveyed to every hub and various internal audits were planned to review the conditions. Proper channelization of medical indicators at the time of discharge and various other methods were incorporated. Intense root cause analysis was done to draft the indicators for reduction in the number of unplanned re-admissions.

After reviewing of all internal audit reports; various targets were set for all hospitals to reduce the rate of unplanned re-admissions. It was observed that after the Improve phase the rate of re-admissions per 1000 discharges fell from 8.18 to 3.43. The rate is now equivalent to global institutionalized rate. Further its being ensured that all the studied and incorporated medical indicators shall be used in future as a mandate and included in contents of standard operating policies.

List of Abbreviations

1. PAN Max : Group of Max Hospitals Across Delhi
2. JAMA : Journal of American Medical Association
3. DMAIC : Define-Measure-Analyze-Improve-Control
4. CMS : Centers for Medicare & Medicaid Services
5. NQF : National Quality Forum
6. Hb : Hemoglobin
7. Na : Sodium
8. TLC : Total Leucocyte Count
9. Max PPA : Max Hospital, Pitampura
10. Max PPG : Max Hospital, Patparganj
11. Max GGN : Max Hospital, Gurgaon
12. Max SHB : Max Hospital, Shalimar Bagh
13. LAMA : Leave Against Medical Advice
14. COPD : Chronic Obstructive Pulmonary Disease
15. CAD : Chronic Artery Disease
16. RHD : Rheumatic Heart Disease
17. DM : Diabetes Mellitus
18. HTN : Hypertension
19. NNH : Neonatal Hyperbilirubinemia

TABLE OF CONTENTS

Certificate by the Industry guide	ii
Certificate by the Mentor	iii
Acknowledgment	iv
Executive summary	v
List of Abbreviations	vi

	Page no.
Chapter I Plan of the Project	
1.1 Introduction to topic	09
1.2 Objective of the Project	12
1.3 Literature review	13
Chapter II Company Profile	14
Chapter III Research Methodology	
3.1 Purpose of the Project	18
3.2 Research Hypothesis	18
3.3 Research Methodology of the Project	18
3.3.1 Research Design	18
3.3.2 Data Collection Techniques	18
3.3.3 Type of Questions	19
3.3.4 Sample Population & Defects	19
3.4 Project Analysis	19

	Page no.
3.4.1 Data Collection Technique	20
3.4.2 Sampling Design	
3.4.3 Instrument for Data Collection	20
3.4.4 Drafting of a questionnaire	20
3.3.5 Limitations of Project	20
Chapter IV Six Sigma Approach Validations	
4.1 Improvement Opportunity: Define Phase	21
4.2 Performance: Measure Phase	23
4.3 Analysis & Interpretations: Analysis Phase	27
4.4 Recommendations: Improve Phase	31
4.5 Control Phase	32
5.0 Conclusion	33
BIBLIOGRAPHY	34
ANNEXURE - A	35

CHAPTER I

PLAN OF PROJECT

1.1 INTRODUCTION

The Indian healthcare industry, including hospitals, medical infrastructure, medical devices, clinical trials, outsourcing, telemedicine, health insurance and medical equipment, was valued at US\$ 79 billion in 2012, and is expected to reach US \$160 billion by 2017. The Indian healthcare sector is expected to grow at about 15 percent year-on-year (y-o-y), on account of factors such as rapid growth in infrastructure development, creation of demand for higher levels of healthcare, rising awareness of end users, and launch of innovative insurance, reimbursement, and financing policies.

The growth of the Indian healthcare sector is further driven by the 300 million strong middle class population with significant disposable income, which is likely to demand superior healthcare services. The healthcare equipment sector attracted 8.8 per cent of the total investments in terms of deal value with an aggregate of US\$ 249.01 million (20 deals), according to data released by VCCEdge. The hospital and diagnostics centre in India received foreign direct investment (FDI) worth US\$ 1,597.33 million, while drugs & pharmaceutical and medical & surgical appliances industry registered FDI worth US\$ 10,318.17 million and US\$ 622.99 million, respectively during April 2000 to March 2013, according to data provided by Department of Industrial Policy and Promotion (DIPP). The diagnostics sector in India has been witnessing immense progress in innovative competencies and credibility. In addition, the emerging sectors, such as bio-generics and pharma packaging are also paving way for the pharmaceutical market to continue its upward trend during FY 2012- FY 2014.

The favorable demographic virtues offer an attractive market for healthcare providers and investors in India. An increase in foreign investment inflow and private equity (PE) that deals in the industry's various segments have also been noted, in addition to the increased focus received from the Government.

The Indian healthcare providers plan to spend Rs 5,700 crore (US\$ 986.16 million) on IT products and services in 2013, a 7 per cent rise over 2012 revenues of Rs 5,300 crore (US\$ 916.96 million), as per a report by Gartner. India and the United Kingdom (UK) have signed a memorandum of understanding (MoU) on cooperation in the field of health sector. The latter is eager to assist and partner India in achieving low-cost, high quality care, said Mr Kenneth Clarke, British Cabinet Minister and Prime Minister's Trade Envoy.

Some of the major investments in the sector include:

Smith & Nephew Plc, a global medical technology provider, has acquired Sushrut Surgicals Pvt. Ltd, along with its brands and assets, for Rs 380 crore (US\$ 65.74 million). With this acquisition, Smith & Nephew has entered into India's US\$ 50 billion healthcare industry, growing at a CAGR of 15 to 20 per cent

Kirloskar Group, along with Toyota Tsusho Corporation (TTC) and Secom Hospitals, will launch a multi-specialty hospital in Bengaluru. The joint venture (JV) has invested Rs. 200 crores (US\$ 34.60 million) and is expected to be operational in July 2013

Abu Dhabi-based New Medical Centre Group plans to invest Rs 500 crore (US\$ 85.51 million) in healthcare sector in India, as per Mr B R Shetty, the company's Chief Executive Officer. The Group aims to help in taking latter's healthcare facilities to international standards

General Electric (GE) is planning to invest US\$ 2 billion over the next five years, to accelerate the development of innovative software for healthcare systems and applications

Oil and Natural Gas Corporation Ltd (ONGC) plans to invest Rs 100 crore (US\$ 17.54 million) for bringing super specialty hospital in Sivasagar district, Assam
Manipal Health Enterprises (MHE) has entered the andrology and reproductive medicine services by acquiring Ankur Healthcare.

Patients are admitted to hospitals from different sources:

OPD - Doctors may advise for admission to the respective ward.

Casualty - Emergency patients are treated and/or admitted if required.

Labour room - Gynecological or Obstetric patients are treated and advised for admission.

Admission Procedure

Patients are admitted to the concerned ward on the advice of the treating doctor. The ward is designated by the inquiry staff at the admission desk and entered in the case sheet. The categories mentioned as per the doctor's advice include SIL (seriously ill) category, medico legal category or the IOW/IOD/ex gratia category.

Discharge Procedure

Planning for a patient's discharge should take place at the earliest opportunity. You and the patient should be involved at all stages of planning for discharge. Hospital and social care staff should work together to manage all parts of the discharge process. This is to ensure that the patient is suitably cared for after they have left hospital and not at risk of being unable to cope.

You should be given an opportunity to talk about your needs as a caretaker and what help you may need to look after the patient. It is your legal right to have your needs addressed and this is achieved by having a caretaker's assessment.

Before the patient leaves hospital the following should also happen:

You and the patient should expect to be given both verbal and written information, with contact details and any relevant information about future treatment and care. The information should be available in a language suitable for you, large print or Braille. A 'discharge co-ordinator' (or ward care coordinator) should be available to coordinate the planning process and act as a key person for you to contact to find out about the discharge plans.

In situations where a patient does not want you to be involved or have information about their care, you should be informed of this and advised of your own right to an assessment.

If the patient lacks mental capacity you may be able to make certain decisions about health and welfare matters if you have a Lasting Power of Attorney (LPA) dealing with health and welfare matters. If there is no LPA the law requires professionals to

act in the patient's 'best interests' and you should be involved in the decision making process.

Every time a patient gets discharged it is expected to have one re-admission from hundred discharges. Re-admission is best defined as an unplanned admission within 15 days with same clinical problem for which the patient was treated earlier. One of the costly realities viewed by many policymakers as symptomatic is failing of health care system. To help address this problem, various literature studies were considered and six sigma approaches was applied to reduce the rate of re-admissions. The project was divided into the standard approach of Six Sigma and "DMAIC" was applied to resolve the problem and achieve improved state of healthcare system.

Various modalities are being incorporated as a result, hospitals are improving their discharge planning processes and providing transitional patient care after hospital discharge. Review of patient before discharge is given top most priority to improve discharge planning.

Several models of discharge planning and transitional care have been documented in the medical literature. These models, described below, can serve as teaching examples for hospitals now faced with the challenge of reshaping their care processes to reduce their readmission rates. The approach incorporate comprehensive planning and analysis before discharge, and once again in the home or other outpatient care setting.

1.2 OBJECTIVE OF THE STUDY

General Objective:

To assess parameters to reduce rehospitalization

Specific Objectives:

- To assess the rehospitalized patients on various parameters (Acc to JAMA Internal Medicine study, 2012)
- To analyze the data to understand the causes for rehospitalization
- To formulate a predictive tool for prevention of readmissions

SCOPE OF THE PROJECT

This project has a wide scope among the healthcare sector. The project focuses on various aspects of unplanned re-admissions which will help to improve healthcare delivery system. The project will help to improve the quality management system of Max Healthcare, Delhi and incorporate the usage of Six Sigma as a quality tool to improve.

1.3 REVIEW OF LITERATURE

June 2007 and 2008 Med Pac reports highlight avoidable rehospitalization as an area of poor quality, recommends data reporting and payment reforms.

May 2008 NQF endorsement of 5 outcome measures for care transitions;

June 2008 Florida becomes first state to publically report potentially preventable rehospitalization rates and launch state wide effort to improve;

August 2008 CMS launch of Care Transitions contracts in 14 communities, with the specific aim of improving transitions and care coordination across the continuum to reduce rehospitalization.

November 2008 The National Priorities Partnership announced 6 priority areas for the United States, including care coordination and reducing 30 day readmissions;

February 2009 Obama Administration highlights avoidable rehospitalization as an area of poor quality, and recommends paying hospitals a flat fee for a hospitalization and the 30 days of follow-up care

March 2012 JAMA Internal Medicine study suggested 7 characteristics which indicate high prevalence of readmissions in hospitals.

CHAPTER 2

COMPANY PROFILE

Max Healthcare Institute is a healthcare institute based in New Delhi, India. The Institute is a wholly owned subsidiary company of Max India Limited, established in 1985.

The institute operates eleven centers in Delhi, NCR and neighboring Punjab region, providing health care services in more than 30 disciplines.

With over 1900 beds and 12 hospitals in Delhi-NCR, Punjab and Uttarakhand, over 1600 world-class doctors and 5400 support staff, Max Healthcare is one of the leading chains of hospitals in India. With 275 ICU beds & the most advanced technology, our state-of-the-art infrastructure is rated the best in North India thereby making Max Healthcare one of the best hospitals in India.

The company provides patient services including nuclear medicine and cardiac imaging, labs, scans, cardiology, cardiac pacing, electrophysiology, neurosciences, orthopedics, gynecology and obstetrics, pediatrics, maternity services, diagnostic services, pediatric ophthalmology, neurophthalmology, internal medicine, general surgery, urology, nephrology, gastroenterology, mental health and behavioral sciences, rehabilitative services, Pulmonology and IVF etc.

VISION OF MAX HEALTHCARE:

Deliver international class healthcare with a total service focus by creating an institution committed to the highest standards of Medical & Service excellence, Patient care, scientific knowledge, Research & Medical Education.

MISSION:

- | | |
|---|--|
| a. Create exceptional standards of Medical & Service Excellence | e. Create international centre for excellence for select Super Specialties |
| b. Care Provider of FIRST CHOICE | f. Safety – Patient, Customer, Staff |
| c. Principal choice for physicians | |
| d. Ethical practices | |

Below listed are the Hospitals of the Max Healthcare Family:

1. The first Max healthcare centre was opened as Max Med centre in Panchsheel Park, New Delhi with OPD facilities and day care surgeries in 2000.
2. In 2002, Max Hospital was opened in Pitampura. It was the first hospital to be ISO certified & also first high end secondary care centre in North Delhi.
3. Max Hospital, Noida was opened in 2002 with services including non-invasive cardiology, orthopedics, ENT, ophthalmology, nephrology, etc dedicated to mother & child care.
4. Max Heart and Vascular Institute were established in 2004 with advanced cardiac life support and air evacuation service in Saket. It was the first Super Tertiary Care Facility with Advanced Cardiac Life Support Ambulances and Air Evacuation Service.
5. Max Hospital in Patparganj was founded in 2005. It was the 1st Multispecialty Tertiary Care centre in East Delhi with 147 Beds, 3 OTs and 1 Cath Lab.
6. In the same year, Max Eye and Dental Care centre was opened at Panchsheel Park, New Delhi.
7. Max Super Specialty Hospital in Saket was founded in 2006. It was the first Multi- Super Specialty Tertiary Care Location.
8. Max Hospital, Gurgaon was opened in 2007. It is the High End Secondary Care Centre in Gurgaon
9. Max Healthcare Consolidated its position in Delhi & NCR through the launch of its 300 bedded Facility in Shalimar Bagh in November 2011.
10. Max Healthcare extended its footprint in North India (in PPP with Govt. of Punjab) in September 2011 with Max Super Speciality Hospital, Mohali & Max Super Speciality Hospital, Bhatinda.
11. Latest in the list is Max Hospital, Dehradun opened in May'12.

MEDICAL QUALITY DEPARTMENT

Medical Quality Mission:

To establish MHCs clinical and safety outcomes at the highest level; comparable to the best known institutions of the world.

The objectives of the department are as follows:

- a. Satisfying customer needs
- b. Enhancement of quality systems
- c. Effective performance measurement & compliance systems
- d. Continuous Improvement loop
- e. Engage every employee in quality drive

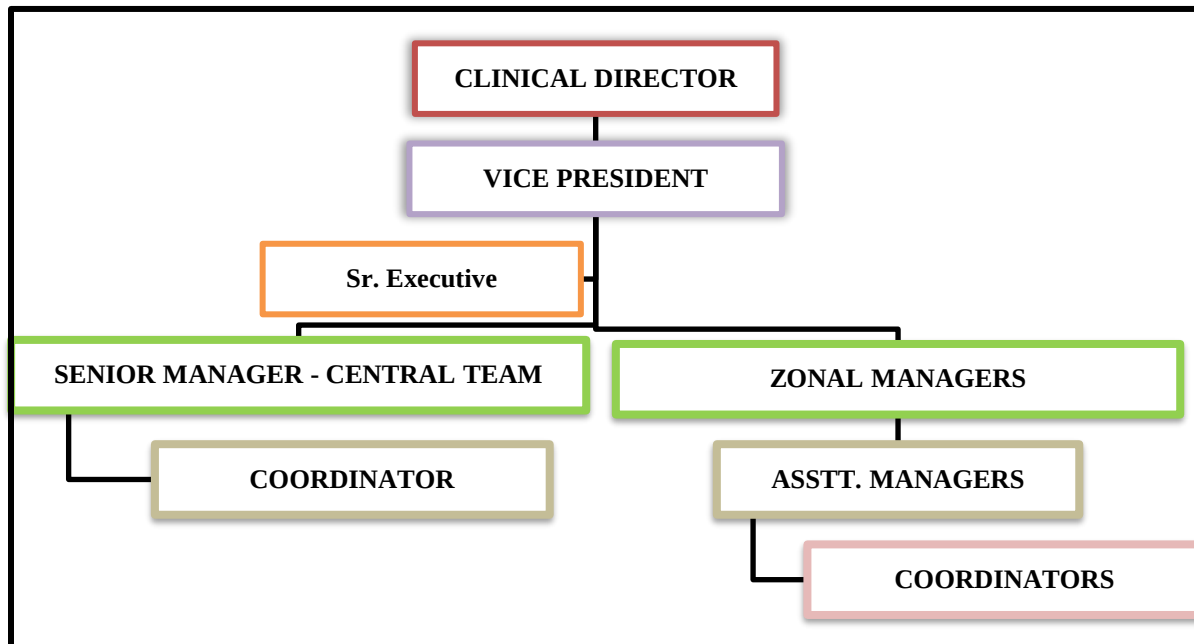
ACCREDITATIONS

- The Max Institute of Minimal Access, Metabolic & Bariatric Surgery has accredited as a centre of Excellence for providing state-of-the-art Clinical Services and Surgical Training Programmes for Abdominal Wall Hernia Surgery.
- Max Super Specialty Hospital, Saket was awarded FICCI award for Operational Excellence in Healthcare Delivery.
- FICCI awarded Max Super Specialty Hospital, Patparganj with the Healthcare award for Operational Excellence in Environmental Conservation.
- In the inaugural edition of FICCI Healthcare Excellence Awards, Max Super Specialty Hospital, Saket was acknowledged one of the Best Hospitals for 'Excellence in Healthcare Delivery'.
- Max Healthcare was awarded the prestigious DL Shah National Award on 'Economics of Quality' from Quality Council of India.
- The Blood Bank at Max Healthcare was awarded the 'NABH Accreditation for Blood Bank'.
- Max Super Specialty Hospital and Max Devki Devi Heart & Vascular Institute at Saket, the two tertiary care hospitals of Max Healthcare, are the first two hospitals of North India

to have received the prestigious accreditation from National Accreditation Board for Hospital & Healthcare Providers.

- Max Labs 24x7 at MSSH, Saket was certified by The National Accreditation Board for Testing and Calibration Laboratories (NABL).
- Five Hospitals of Max Healthcare are ISO 9001:2000 certified. They are located at MHVI-Saket, Max Balaji - Patparganj, Max Hospitals at Pitampura and NOIDA and Max Med Center – Panchsheel. Max Hospital - Pitampura has also been certified for ISO: 14001:2004.

ORGANIZATION STRUCTURE – MEDICAL QUALITY



CHAPTER 3

RESEARCH METHODOLOGY

3.1 PURPOSE OF THE PROJECT

Six Sigma approach was being incorporated to reduce unplanned re-admissions within 15days of discharge from the hospitals. Various variable were considered and improved to attain success.

3.2 PROJECT HYPOTHESIS

1. Readmission is more prevalent with variation in disease burden, healthcare history, socio-demographic & other associated factors.
2. Rehospitalization is more prevalent with variation in operation of process during stay, discharge & communication.

3.3.1 RESEARCH DESIGN

Research design is the plan, structure to answer whom, when, where and how the subject is under investigation. Here plan is an outline of the research scheme & which the researcher has to work. The structure of the research is a more specific outline and the strategy out, specifying the methods to be used in the connection & analysis of the data.

Analytical Research Design incorporating Cross Sectional Comparisons, which is qualitative and quantitative. The main characteristics of this method is that the researcher has no control over the variables and he can only report what has happened or what is happening.

The study compares the medical indicators in discharged patients.

3.3.2 DATA COLLECTION

The main source of information for this study is based on the data collection. Data collected are both primary and secondary in nature.

Primary Data Primary data have been directly collected from the medical record department of various hospitals. Questions like open ended, close ended type, etc. have been used for the purpose of data collection.

Secondary Data Secondary data have been collected from Hospital Information System (e-medical records).

3.3.3 TYPES OF QUESTIONS

- Open ended question are the type of question used to get data from the respondent records in order to give feed back to the organization.
- Close ended question are the type of questions with a clear declined set of alternatives that confine the respondents data alignment.
- Likertscale : It uses 5 point or 10 point scale to elicit respondent's favour or unfavour towards an object and was incorporated in patent assessment sheet.
- Questioner for deriving data and pre-assessment sheet was used.

3.3.4 SAMPLE POPULATION & DEFECTs

More than 28,000 discharges were monitored from the period of December 2012 to March 2013. Defect was defined as any unplanned re-admission. There were total 137 re-admissions in the defined period.

3.4 PROJECT ANALYSIS

3.4.1 Data Collection Techniques

Qualitative : Itemized patient sheet

Quantitative : Medical Records

3.4.2 Sample design

Stratified Random sampling: Strata are chosen as per different categories susceptible to readmission.

The Stratification is done as follows:

- Department wise
- Diagnosis wise
- Biochemistry test variance level

Systematic random sampling with probability proportionate to population size(PPS) of patients turning to Max Hospital & their medical records will be done to generate the sample for the study.

3.4.3 Instrument for Data Collection

Questioner & Data Sheets

3.4.4 Drafting of a questionnaire

Various needs of healthcare, availability of medical services, costing, financial analysis and insurance company positioning was consider.

3.5 LIMITATIONS OF THE PROJECT

There were certain limitations in undertaking this research work. As it is understood that the limitations are a part of the project, they have been overshadowed by the benefits of the project.

- The survey conducted may not be considered as comprehensive it is a retrospective project.
- Some of the records cannot be traced back or have lost follow-up
- Only limited sample size had been considered for the project.

CHAPTER 4

SIX SIGMA APPROACH VALIDATIONS

4.1 IMPROVEMENT OPPORTUNITY: DEFINE PHASE

Primarily we define Objectives for project:

- To assess the rehospitalized patients on various parameters.
- To analyze the data to understand the cause for re-hospitalization.
- To formulate a predictive tool for prevention of Re-admissions

Then we considered the available literature for the project :

1. June 2007 and 2008 Med Pac reports highlight avoidable rehospitalization as an area of poor quality, recommend data reporting and payment reform.
2. May 2008 NQF endorsement of 5 outcome measures for care transitions;
3. June 2008 Florida becomes first state to publically report potentially preventable rehospitalization rates and launch state wide effort to improve;
4. August 2008 CMS launch of Care Transitions contracts in 14 communities, with the specific aim of improving transitions and care coordination across the continuum to reduce rehospitalization.
5. November 2008 The National Priorities Partnership announced 6 priority areas for the United States, including care coordination and reducing 30 day readmissions;
6. February 2009 Obama Administration highlights avoidable rehospitalization as an area of poor quality, and recommends paying hospitals a flat fee for a hospitalization and the 30 days of follow-up care
7. March 2012 JAMA Internal Medicine study suggested 7 characteristics which indicate high prevalence of readmissions in hospitals.

Then we conclude variables to be monitored to prevent the re-admissions in the hospitals.

1. Analysis of Hb level
2. Analysis of Na level
3. Analysis of TLC level
4. Analysis of Length of Stay
5. Analysis of Causes of Re-admissions
6. Department wise associated analysis
7. Age group wise associated analysis

Finally we defines the various faces of project to accelerated through :

Study Area

Max Hospital (Across Delhi)

Study Respondents

Medical Records

Sampling Technique

Stratified Random sampling

Strata are chosen as per different categories susceptible to readmission.

The Stratification is done as follows:

- Department wise
- Diagnosis wise
- Biochemistry test variance level

Systematic random sampling with probability proportionate to population size(PPS) of patients turning to Max Hospital & their medical records will be done to generate the sample for the study.

4.2 PERFORMANCE: MEASURE PHASE

Various records were assessed to draw following data and sigma rating at PAN Max level. Based on the average of 4-months and taking scope of re-admission as 30 reasons.

Formulas used are:

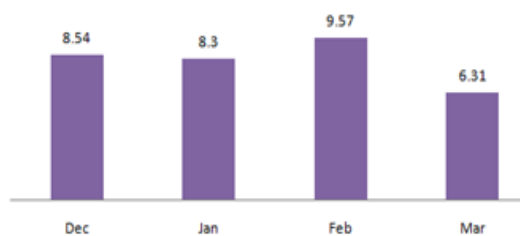
$$\text{Defect per million (DPM)} = \frac{\text{No. of Re-admissions}}{\text{No. of Discharges}} \times 10^6$$

$$\text{Defects per million Opportunities} = \frac{\text{No. of Re-admissions}}{\text{No. of Discharges} \times \text{No. of Scope/ Reasons of re-admissions}} \times 10^6$$



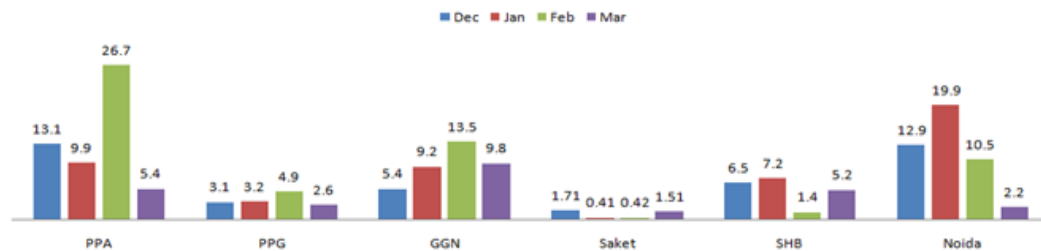
Time Period : Dec 2012 – March 2013

PAN MAX Re-admissions per 1000 Discharges



Current Sigma Level of PAN Max : **5.068**
{ Based on 4 months Avg. Rate of Re-admissions } & taking scope of re-admissions as 30 reasons

Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per million discharges }



Total No. of Readmissions : 137

And the hospital wise records& their sigma ratings are :

MAX PPA HOSPITAL ANALYSIS

For Max PPA			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of Readmission
December	533	07	0.0131
January	503	05	0.0099
February	448	12	0.0267
March	559	03	0.0054
Total	1543	27	0.0174

Quality Parameters

Current Sigma Rating : 4.74 Sigma

{ Based on 4 months Avg. Rate of Re-admissions}

& taking scope of re-admissions as 30 reasons

Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

MAX SAKET HOSPITAL ANALYSIS

For Max Saket			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of readmission
December	2342	04	0.00171
January	2392	01	0.00041
February	2350	01	0.00042
March	2650	04	0.00151
Total	9734	10	0.00102

Quality Parameters

Current Sigma Rating : 5.47 Sigma

{ Based on 4 months Avg. Rate of Re-admissions}

& taking scope of re-admissions as 30 reasons

Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

MAX NOIDA HOSPITAL ANALYSIS

For Max NDA			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of Readmission
December	387	05	0.0129
January	402	08	0.0199
February	379	04	0.0105
March	446	01	0.0022
Total	1614	18	0.0111

Quality Parameters

Current Sigma Rating : 5.45 Sigma

{ Based on 4 months Avg. Rate of Re-admissions}
& taking scope of re-admissions as 30 reasons

Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

MAX PPG HOSPITAL WISE ANALYSIS

For Max PPG			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of Readmission
December	2577	08	0.0031
January	2198	07	0.0032
February	2224	11	0.0049
March	2609	07	0.0026
Total	9608	33	0.0034

Quality Parameters

Current Sigma Rating : 5.18 Sigma

{ Based on 4 months Avg. Rate of Re-admissions}
& taking scope of re-admissions as 30 reasons

Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

MAX GGN HOSPITAL ANALYSIS

For Max GGN			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of Readmission
December	555	03	0.0054
January	541	05	0.0092
February	516	07	0.0135
March	610	06	0.0098
Total	2222	21	0.0094

Quality Parameters

Current Sigma Rating : 4.86 Sigma
 { Based on 4 months Avg. Rate of Re-admissions}
 & taking scope of re-admissions as 30 reasons
 Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

MAX SHB HOSPITAL ANALYSIS

For Max SHB			
Month	Total no. Of Discharges	Total Discharges Readmitted	Avg. Rate of Readmission
December	766	05	0.0065
January	830	06	0.0072
February	819	12	0.0014
March	948	05	0.0052
Total	3363	28	0.0083

Quality Parameters

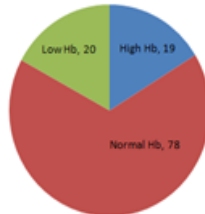
Current Sigma Rating : 4.95 Sigma
 { Based on 4 months Avg. Rate of Re-admissions}
 & taking scope of re-admissions as 30 reasons
 Ideal Rating : 6 Sigma { i.e. 3.4 re-admissions per billion discharges}

4.3 ANALYSIS & INTERPRETATIONS: ANALYSIS PHASE

Various trends of following variables were observed:

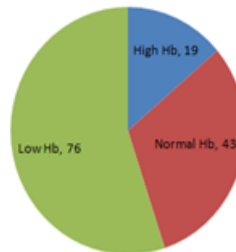
1. Analysis of Hb level

Analysis of Hb level at time of discharges which have
unplanned Re-admissions in 4 months : PAN MAX



<13 : Low Na ion
13-17 : Normal Na ion
>17 : High Na ion

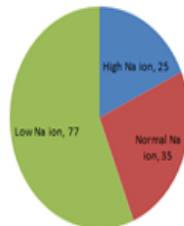
Analysis of Hb level at time unplanned Re-admissions
in 4 months : PAN MAX



<13 : Low Na ion
13-17 : Normal Na ion
>17 : High Na ion

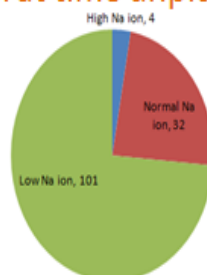
2. Analysis of Na level

Analysis of Na ion level at time of discharges which have
unplanned Re-admissions in 4 months : PAN MAX



<136 : Low Na ion
136-144 : Normal Na ion
>144 : High Na ion

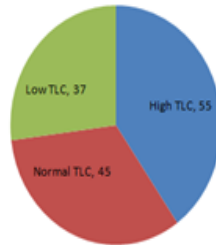
Analysis of Na ion level at time unplanned Re-admissions
in 4 months : PAN MAX



<136 : Low Na ion
136-144 : Normal Na ion
>144 : High Na ion

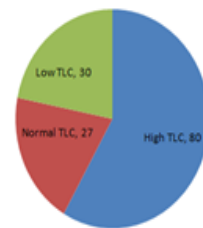
3. Analysis of TLC level

Analysis of TLC level at time of discharges which have
unplanned Re-admissions in 4 months : PAN MAX



<04 : Low TLC
04-10 : Normal TLC
>10 : High TLC

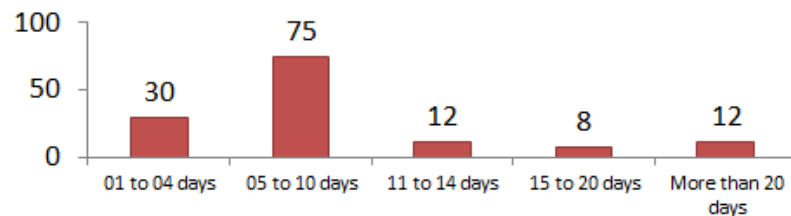
Analysis of TLC level at time unplanned Re-admissions
in 4 months : PAN MAX



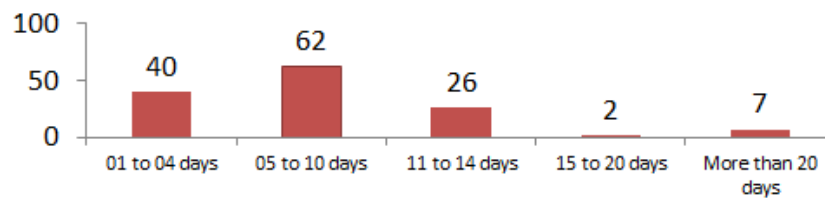
<04 : Low TLC
04-10 : Normal TLC
>10 : High TLC

4. Analysis of Length of Stay

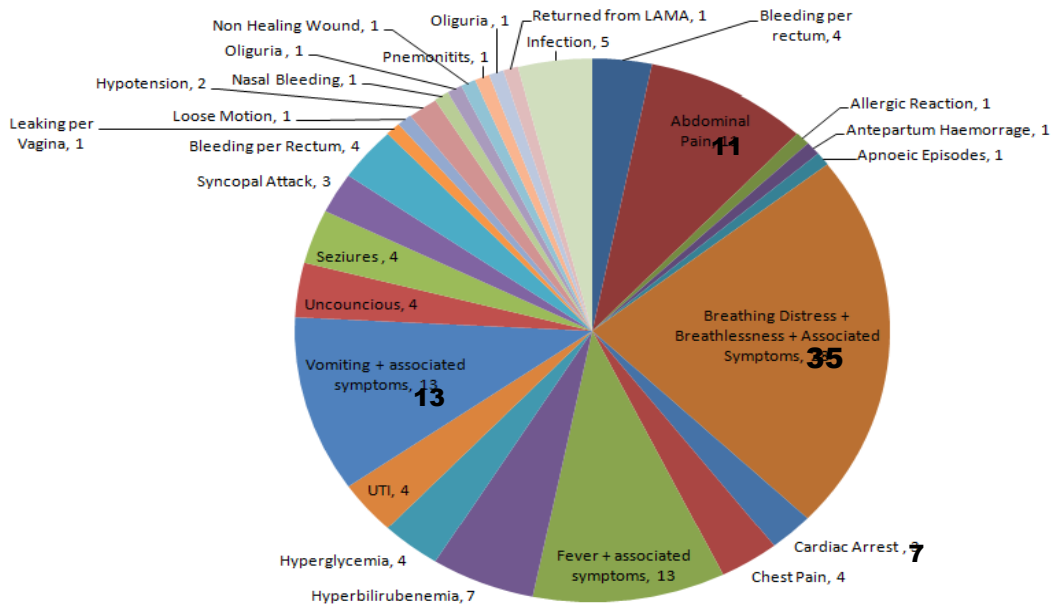
Analysis of Length of Stay during Admissions in 4 months : PAN MAX



Analysis of Length of Stay during Re-admissions in 4 months : PAN MAX

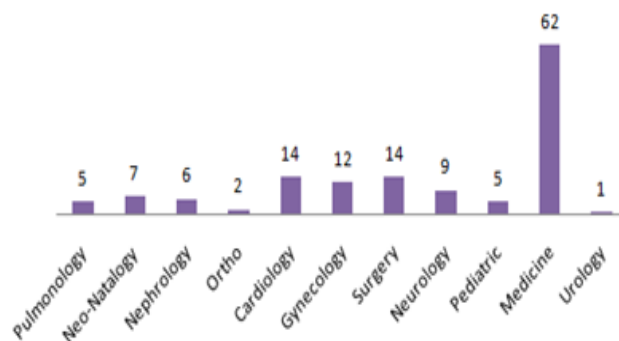


5. Analysis of Causes of Re-admissions



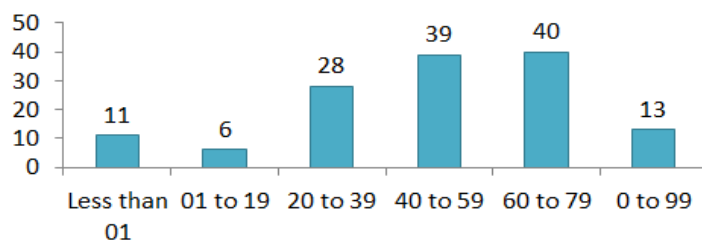
6. Department wise associated analysis

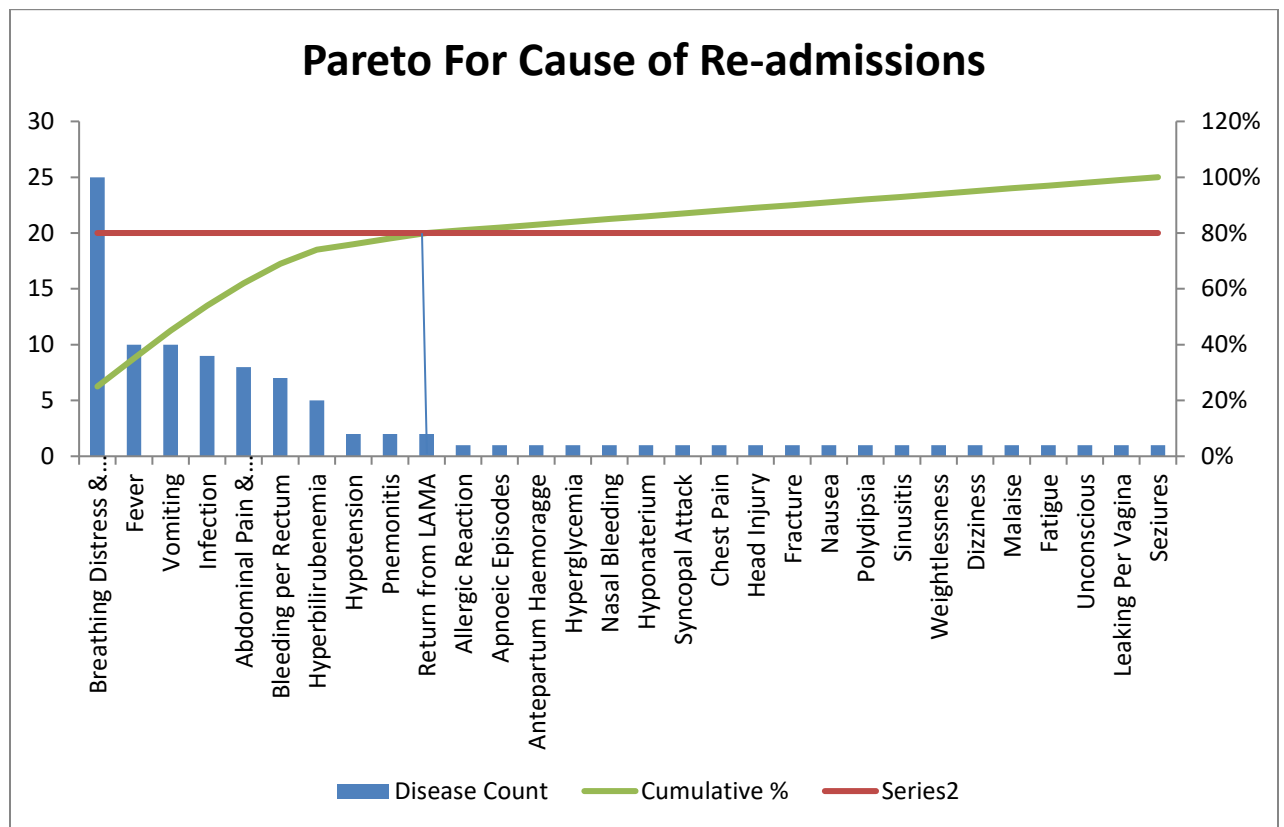
Department wise Re-admissions in 4 months : PAN MAX



7. Age group wise associated analysis

Age Group Analysis of Re-admissions in 4 months : PAN MAX





It was observed that following causes/ disease count contribute to 80% of the re- admissions, if we can target the following while at our internal improvement level we can reduce the rate. The diseases leading the trail are :

1. Breathing Distress & Associated Symptoms
2. Fever
3. Vomiting
4. Abdominal Pain & Associated symptoms
5. Bleeding Per Rectum
6. Hyperbilirubenemia
7. Hypotension
8. Pneumonitis
9. Return from LAMA

4.4 RECOMMENDATIONS: IMPROVE PHASE

After the analysis it was observed that the present scenario demands following urgent targets to improve the process:

- ✓ To decrease the rate of re-admissions by 20 % on initial reviews & audits
- ✓ To decrease the rate of undue & unplanned re-admissions by internal audits & root cause analysis for re-admissions.
- ✓ To improve the Six Sigma Quality Rating of various Max hospitals.

The promptness of discharge process and following recommendations were made and all of the stated below points were considered and converted into actions :

1. Focusing upon inter-departmental audit reports regarding re-admissions.
2. Analysis of all major factors that can be accounted for decrease in unplanned re-admissions.
3. Proper root cause analysis for re-admissions.
4. Analysis of all undue re-admissions within less than 48hrs.
5. Arrangement of proper training & brush up classes.
6. Various promotional strategies were implemented.
7. Focus to improve quality rating was incorporated in quality policy

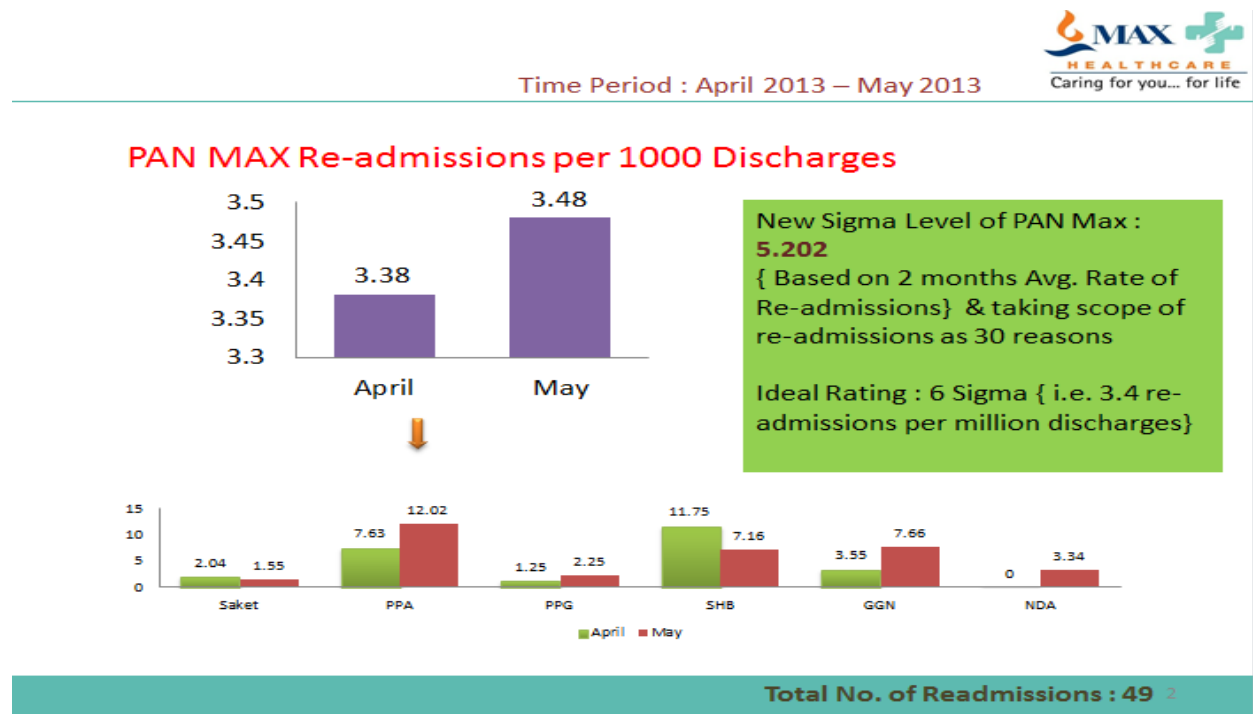
Below mentioned combination of diseases were also tagged to key concern as they contribute to of re-admissions derived after intense analysis of cause's derived from perato :

1. COPD+ Asthma+ Cor Pulmonale
2. CAD+ DVD+ RHD+ SAR+ SMR
3. Fever + Infection
4. Primigravadia
5. DM+HTN
6. TERM+AGA+LSCS+NNH

4.5 CONTROL PHASE

After the various improvements through channelized approach of Six Sigma we observe following improvement:

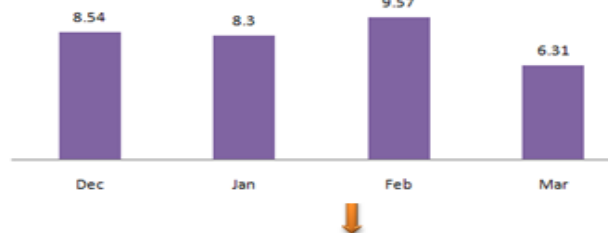
1. At PAN Max Level :



2. In terms of Per Thousand Discharges (Qualitative outcome of hospital)

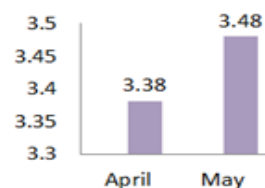
PAN MAX Re-admissions per 1000 Discharges

Dec 2012 – March 2013



PAN MAX Re-admissions in 2 Months after Interventions

April 2013 – May 2013



Now the levels of improvement have been achieved that much that we are potential enough to compete even while in comparisons with international standards:

PAN Max	: 00.34 %
CMS(U.S.A)	: 02.70 %
Other US Hospitals	: 01.48 %
Other European Countries	: 05.90 %

5.0 CONCLUSION

The project was conducted to analysis rate of re-admissions with the corresponding discharge of patients. The project has accomplished its objectives, by thoroughly analyzing and identifying the medical quality indicators, strengths and weaknesses of various departments for their treatment planning. The outcome of this project has highly benefitted the organization.

The outcome of the study has proved that the performance of the organization has improved and is outstanding in comparison with other competitors in the hospital segment and that the organization has gained a higher reputation among patients.

It is concluded that the rate of re-admissions has been controlled by the approach of Six Sigma and various steps based on the action taken throughout the process is being incorporated among standards of Operations(SOP's) and quality policy. The organizations by adopting certain steps have improved patient safety and care. Steps adopted on Six Sigma approach, can further improve performance of hospitals and occupy a leading position among other competitors in the corporate hospitals in future years to come.

BIBLIOGRAPHY

1. Six Sigma Hand Book – IIIrd Edition : Thomas Pyzdek & Paul Keller
2. Six Sigma Demystified – Paul Keller
3. Various search engines & PubMed E-journal

ANNEXURE - A

Patient Identification No. :

Age :

Sex :

Place :

Department :

During Admission :

Admitting Diagnosis	
Discharge Diagnosis	
Length of Hospital Stay	
Bed Days	
State of Admission (Critical / Non - Critical)	
Type of Discharge (Planned / Unplanned)	
No. Of admissions within prior year	
No. Of procedures during first admission	
Presence of complicating conditions	
Presence of Hospital Acquired Infection	
Record of Blood Transfusions	
Entitlement status	
Associated Departments for Treatment	
Any treatment or procedure Oncology Department	
Any treatment or procedure Cardiology Department	
Any other findings	

Biometric Variant	Normal Range	Value at Admission	Value at Discharge
Haemoglobin	Female :12-16g/dl Male : 13.5-17.5g/dl		
Sodium	136-146meq/dl		
Any Other findings			

During Re-admission :

Cause of Readmission	
Admitting Diagnosis	
Discharge Diagnosis	
Length of Hospital Stay	
Bed Days	
State (Critical / Non - Critical)	
Type of Discharge (Planned / Unplanned)	
No. Of admissions within prior year	
No. Of procedures during first admission	
Presence of complicating conditions	
Presence of Hospital Acquired Infection	
Record of Blood Transfusions	
Entitlement status	
Associated Departments for Treatment	
Any treatment or procedure Oncology Department	
Any treatment or procedure Cardiology Department	
Outcome of Discharge	
Any other findings	

Biometric Variant	Normal Range	Value at Admission	Value at Discharge
Haemoglobin	Female :12-16g/dl Male : 13.5-17.5g/dl		
Sodium	136-146meq/dl		
Any Other findings			