Summer Training at
Kokilaben Dhirubhai Ambani Hospital, Mumbai
(April 3 to June 2, 2017)

DMAIC Approach to Reduce the Waiting Time in Out Patient Department of KDAH

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INSTITUTE OF HEALTH
MANAGEMENT RESEARCH
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IIHMR UNIVERSITY

CERTIFICATE

This is to certify that **Dr. Monica Udenia** has undergone summer training in **Kokilaben Dhirubhai Ambani Hospital, Mumbai from 3rd April to 2nd June 2017.**

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

I wish her success in all her future endeavors.

Col. (Dr.) Ashok Kaushik
Dean (Academic & Student Affair)
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21/6/2017

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hospital & medical research institute

Every Life Matters

02nd June 2017

To whomsoever it may concern

This is to certify Ms. Monica Udenia from IIHMR Jaipur has successfully completed an internship with the clinical administration department at Kokilaben Dhirubhai Ambani Hospital from 01/04/2017 to 02/06/2017.

During her tenure, she has worked on the following projects:

- "Improving Turn Around Time of the Out Patient Department using Six Sigma Principles"
- "Designing of scorecard for Performance Evaluation of Resident Medical Officers"

Her performance was satisfactory and we wish her success in her future endeavors.

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for

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I would like to express my heartfelt appreciation to all those who provided me with all the help needed to complete this project. A special gratitude I give to the Chief executive officer (KDAH) and our mentor Dr Ram Narain for providing me the opportunity to work as a trainee in their organisation. Special thanks to our guide Dr. Milind Khadke and Dr. Nilesh Gumardar for their contribution in promt suggestions and fuelling encouragement that helped me to coordinate my project.

Furthermore, I would also like to acknowledge the crucial role of the staff specially the CCOs of all OPD department of KDAH, who gave the permission to use all required data and the necessary material to complete the project.

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HOSPITAL PROFILE OF KOKILABEN DHIRUBHAI AMBANI HOSPITAL, MUMBAI

ACRONYMS/ ABBREVIATIONS

- A&E- Accident and Emergency
- HCA- Health Care Assistant
- ALOS- Average Length of Stay
- CMD- Chief Medical Officer
- COO- Chief Operating Officer
- CGHS- Central Government Health Scheme
- CSSD- Central Sterile and Supply Department
- CT- Computerized Tomography
- ECG- Electro Cardiogram
- TMT- Treadmill Test
- EEG- Electro Encephalography
- EMG- Electro Myography
- HOD- Head Of Department
- HRD- Human Resource Department
- ICU- Intensive Care Unit
- SICU- Surgical Intensive Care Unit
- MICU- Medical Intensive Care Unit
- HDU- High Dependency Unit
- PICU- Paediatric Intensive Care Unit
- NICU- Neonatal Intensive Care Unit
- OPD- Out Patient Department
- TAT- Turnaround Time

HOSPITAL PROFILE

Introduction

With Tina Ambani as a chairperson, Kokilaben Dhirubhai Ambani Hospital & Medical Research Institute is India’s one of the most advanced tertiary care facilities. As the flagship, social initiative of the Reliance Group headed by Anil Dhirubhai Ambani, the hospital is designed to raise India's global standing as a healthcare hub, with emphasis on excellence in clinical services, diagnostic facilities and research

KDAH is the only hospital in Mumbai with Full Time Specialist System (FTSS) ensuring easy availability and access to dedicated specialists exclusively attached to Kokilaben Dhirubhai Ambani Hospital.

Kokilaben Hospital has been supporting the initiative of helping the babies and children affected by congenital heart disorders through the 'Precious Heart' foundation – a social initiative that presents you with an opportunity to save a little heart, and to give someone a chance to live again.

Kokilaben Dhirubhai Ambani Hospital team is committed to the patient as well as the community at large, by delivering the best possible care every time while dedicating ourselves to continuously improving the way we do things driven by evolving data, benchmarks and best practices.

THE LOGO

The logo of KDAH consist of the name of the hospital along with twelve dots of assorted colours which resembles distinct phases of human life in terms of health and biology.

Following are the meanings of different dots:

RED

Conception: Connection, love, desire, passion, hope

LIGHT PURPLE

New Born: Creation, awakening, wonder, emotion, transformation

PEAR GREEN

Infant: Innocence, joy, vitality, activity, optimism

PINK

Toddler: Energy, zest, excitement, exuberance, imagination.

SKY BLUE

Child: Vigour, positivity, playfulness, confidence, nonchalance

DARK GREEN

Preteen: Youth, curiosity, adventure, intelligence, ingenuity

YELLOW

Adolescent: Discovery, fertility, vivacity, dynamism, creativity

PURPLE

Adult: Evolution, pursuit, stamina, ambition, responsibility

AMBER

Midlife: Focus, warmth, experience, contemplation, introspection

DEEP BROWN

Mature Adult: Dignity, simplicity, stability, endurance, benevolence

LIGHT BROWN

Silver Adult: Balance, wisdom, tranquillity, understanding, contentment

DARK BLUE

Journey's end: Serenity, spirituality, harmony, eternity

VISION

“We aim to be a global healthcare institution that combines the best in medical treatment with strong ethical principles and a culture of care and compassion. "

MISSION

" To be an institution that offers comprehensive quality healthcare services under one roof through transparent patient-centric care ensuring patient safety, privacy and dignity. An institution where Every Life Indeed Matters. "

VALUES

Integrity

To deal with all stakeholders - patients, partners, employees, vendors and the community - in a spirit of fairness and integrity

Transparency

To respect the patient's right to know at every touch point by providing information that is clear, concise, relevant and easy to understand

Maximum Care

To re-evaluate every hospital system, process and procedure to ensure that patient and their loved ones receive maximum care and comfort

Self-Improvement

To instil a process of learning and self-improvement at every level through continuous training, focused research and peer review

Patient Dignity

To safeguard the dignity of patients by protecting their individuality and privacy at all times

Social Responsibility

To dedicate itself to living up to its responsibility in social service, community health, and environmental safety

Patient Safety

To take responsibility in building a culture of safety and to instill a “just” culture promotes patient safety to make healthcare safer for everyone

Passion for Excellence

To believe in having a passion for excellence in every aspect of the work we do; in the overall delivery of service to our customers, in ensuring that we meet the highest international standards

INFRASTRUCTURE

1) LOWER BASEMENT

- Biomedical engineering
- CSSD
- Nuclear medicine
- PET CT
- Radiation oncology
- SRS

2) UPPER BASEMENT

- Car parking
- Central Security Office
- Mortuary

3) GROUND FLOOR

- main reception
- admission counter
- discharge and billing
- pharmacy and medical mall
- gift shop
- prayer hall
- business centre
- fine dining
- food court
- ATM
- Central report collection centre
- Beauty salon
- Accident and emergency

4) mezzanine floor

- Administration
- Library
- Staff dining

5) FIRST FLOOR

- Clinical administration
- Radiology and imaging (X-ray, MRI, Ultrasound, CT scan)

- Health check up program
- Sample collection
- Centre for cardiac sciences

- Centre for bone and joint
- Centre for pulmonary and lung medicine
- Multi-specialty OPD

6) SECOND FLOOR

- Centre for children
- Centre for brain and nervous centre
- Dental clinic
- Centre for cancer
- ophthalmology clinic
- ENT clinic
- Gastroenterology Clinic
- Dialysis Centre
- Blood Bank
- Urology Clinic
- Nephrology Clinic

7) THIRD FLOOR

- OT complex 1 (8 theatres)
- Catherization lab
- ICU (Neuro and Surgical)
- Interventional radiology

8) FOURTH FLOOR

9) FIFTH FLOOR

- Ambulatory Surgery
- Day Surgery
- ICU (cardiac)
- OT complex 2 (7 theatre)
- Refuge Area

10) SIXTH FLOOR

Rehabilitation centre

Convention and exhibition centre

11) SEVEN FLOOR

IVF centre

Cosmetology and aesthetic surgery

Nursing college

TISSUE ANF BONE BANK

12) EIGHT FLOOR

Birthing complex (labour and delivery)

ICU (paediatric and neonatal)

Birthing suites

OT (obstetric)

Wards

13) NINTH FLOOR

Inpatients (paediatric)

14) TENTH FLOOR

High dependency

ICU (medical)

Refuge area

15) ELEVENTH FLOOR

General ward

Nursing college

16) TWELVE TO SIXTEEN FLOORS

Inpatient department

The following departments function in hospital:

Clinical services	Clinical support services	Clinical Administrative Services	Administrative Services
Accident and emergency	Laboratory medicines	Ambulance services	Human resources
OPD	Imaging	Nursing department	Materials
Anaesthesia	CSSD	Food and beverages	Marketing
Critical care	Biomedical waste	Security	Finance
OT	Housekeeping	Mortuary	Engineering
IPD	Pharmacy	Laundry	IT

CLINICAL SERVICES

ACCIDENT & EMERGENCY

An Emergency Department (ED) is also known as Accident & Emergency (A & E), Emergency Room (ER), Emergency Ward (EW), or Casualty Department is a medical treatment facility, specializing in acute care of patients who present without prior appointment, either by their own means or by ambulance. Due to the unplanned nature of patient attendance, the department must provide initial treatment for a broad spectrum of illness and injuries, some of which may be life threatening and require immediate attention.

Layout

- 11 bedded (6+3 triage + 2 isolation)
- Each bed is separated with curtains to maintain patient privacy and is equipped with the following:

✓ Oxygen supply
✓ Suction pump
✓ Syringe pump
✓ Cardiac monitor

Minor Operation Theatre

- Machines in minor OT are as follows: -

✓ Anesthesia machine
✓ ETCO2 machine
✓ Cautery machine
✓ OT table
✓ Procedure done in minor OT
✓ Lumbar puncture
✓ Biopsy
✓ Bone marrow aspiration
✓ Suturing

This department has got its own billing and discharge counter.

Staffs: -

HOD

↓

9 Junior Medical Doctor (2/shift)

↓

1 Head Nurse

↓

24 Staff nurse (6/ shift)

↓

6 HCA (2/shift)

Equipment

- Defibrillator-2
- Portable ECG-2
- Nebulisation machine -2
- Portable sonography machine -1
- Trolleys:
    - ✓ Procedure trolley
    - ✓ Induction trolley
    - ✓ Adult crash trolley
    - ✓ Dressing trolley

Ambulance

There are 2 types of ambulance:

a) Non-cardiac ambulance
b) Cardiac ambulance

Equipment in the ambulance are as follows: -

- Ambulance set
- Portable ventilator (cardiac ambulance)
- Portable oxygen unit
- Portable suction unit
- First aid kit
- Traction splint
- Auxiliary stretcher
- Transfer sheet
- Airways (nasal, oropharyngeal)
- Obstetrical kit
- Sphygmomanometer
- Stethoscope
- Fire extinguisher
- Burn kit
- Others

    - ✓ Sterile and non-sterile gloves
    - ✓ Face mask
    - ✓ Blankets
    - ✓ Towels
    - ✓ Bed pan

- ✓ Tongue depressors
- ✓ Cold packs instant chemical type
- ✓ 1 HCA in non-cardiac ambulance

➢ 1 HCA + 1 nurse + 1 cardiac consultant in cardiac ambulance

OUTPATIENT DEPARTMENT

Kokilaben Dhirubhai Ambani Hospital has 140 independent consultant clinics with a capacity to handle over 6000 outpatient consultation every day. These clinics are organized as functional clusters representing a specialty, with each cluster containing its own examination room, phlebotomy room, and in instances, rooms for specialized medical equipment unique to the cluster. A day care dialysis unit, an endoscopy theatre complex, radiology suites and a blood bank support outpatient service are co-located on the same floors as the self-contained outpatient area. The hospital outpatient services offer specialist consultation services across 42 different specialties including six centers of excellence.

The six centres of excellence are as follows: -

- Centre for neurosciences
- Centre for cancer
- Centre for physical medicine and rehabilitation
- Centre for cardiac sciences
- Centre for bone and joint
- Centre for children

The specialists included are Anaesthesiologist, Critical Care Medical, accident and emergency, gynaecology and obstetrics, imaging, laboratory medicine and pathology including biochemistry, molecular biology, haematology, histopathology, microbiology, clinical pathology, transfusion, medicine, rheumatology, geriatric medicine, surgery including dentistry, ENT, general surgery, ophthalmology, plastic and reconstructive surgery, urology, surgical oncology, cosmetology.

A) Access to OPD services:
   All patients who visit KDAH or free OPD for the first time for consultation/ other services are issued a card which gives each patient a UHID number. This UHID card is attached to the registration form. With the help of this number, medical records of patients can be assessed. Allotment and control of UHID number is the responsibility of the admission staff desk.
B) OPD Appointment:
   Appointments can be fixed over telephone to all from the call centre or personally across the reception counter. Fax and email facilities are also available.
   Following services are offered in the OPD.
   - Medical/ surgical consultations
   - Preventive health check-up packages
   - Laboratory investigations
   - Imaging services
   - Cardiology investigations

- Neurology investigations
- Pulmonary investigations
- Pain management
- AKD
- Gamma knife
- Endoscopy
- Bronchoscopy
- Urodynamic study

- Physiotherapy
- CDC
- ENT
- Ophthalmology
- Dental procedures
- Oncology
- Radiation oncology

HEALTH CHECK UP

- The executive checkup department, a part of OPD services, is a wing of this multispecialty hospital dedicates to the diagnostic and preventive side of patient care. It is a place where healthy patient come for prognosis of disease or to know about the preventive and curative aspect of conditions they may already have.
- This system facilitates the patient to get all the required investigations/ consultations done without having to pay for either consultation and/or for each individual item of pathological or imaging investigations. It is the centre point where the potential customers come directly in contact with hospital services. This department can therefore be a point to draw in patients to become in-patients or for them to come even for follow-up OPD consultation.
- The packages in the program have been developed by a team of highly qualified and experienced medical personnel and are designed to offer a complete medical checkup and within their limitations detect any latent health problems. In additions, these packages are offered at special discounted rates that make them truly worthwhile. At the end of the day, candidates leave the hospital with all their reports.
- This department is dependent on various other hospital departments and consultants to ensure a smooth process flow. Therefore, co-ordination is a key factor in smoothly running the department. The departments in co-ordination are, pathology, radiology, following department, medicine, surgery and gynecology.

OPERATION THEATRE:

The aim of department of anaesthesiology and OT facility is to provide the highest quality of care to patients undergoing various types of surgeries. The OT facility is positioned as a tertiary care centre of excellence providing complete services for various surgical specialties. The

department is staffed with highly experienced and trained anaesthesiologist, surgeons, technicians, nurses and other support staff. Their services have state of the art technology and equipment with highest level environment and quality controls. For each OT there are two scrub nurses and one circulating nurse. Protocols based on approach for quality pre-operative, intra-operative and post- operative and follow-up care of the patients. The complex is divided into three zones: sterile, semi sterile and non-sterile zones. Complete services to the following surgical specialties are provided.

- Cardiac surgery
- Neuro surgery
- Onco surgery
- Orthopaedic surgery

- General surgery
- Gynaecology and obstetrics surgery
- Paediatric surgery
- GI surgery
- Uro surgery
- Plastic surgery
- Ophthalmic and ENT surgery
- Transplantation surgeries

The OT complex has a pre and post-operative monitoring room for continuous monitoring of patients. The facility includes 22 OTs, 600 square feet area, pendants in all OTs and surgical control panels.

IN PATIENT DEPARTMENT

The IPD provides the detailed pre-procedure needs their completion and coordination with the diagnostic to arrive at the diagnosis and completion of treatment regimens, comprehensive care in the pre-operative and follow-up care, rehabilitative, and nutritional regimented their scientific amalgamation as per the progressive patient care need. IPD wards are located on floor numbers 9,10,11,12, 13, 14, 15 & 16. The IPD rooms are of the following types: single room, twin sharing, deluxe room and suites. Each floor has three zones, east, west and central and each wing has a separate nursing station. The various types of rooms with their features as follows:

- GENERAL WARDS
    - 5 beds/room
    - Air conditioned
    - Bed heads panels with medical gases
    - Nurse call systems with two-way communication
- SINGLE ROOMS

    - Area of 320 sq. ft.
    - Separate patient zone and attendant zone
    - Nurse call system with two-way communication.
- TWIN SHARING
    - Bed head panels with medical gasses
    - Television sets
    - Couch for each patient relative
    - Nurse call system with two-way communication.
- SUITS
    - Area of 750 sq. ft.
    - Terrace garden
    - Exclusive visitor area and guest rooms
    - Nurse call system with two-way communication.

Nurse bed ratio is 1:5 for general ward, 1:2 for single rooms, 1:3 for twin sharing, 1:1 for suits. The various other rooms are clean utility, dirty utility, janitor room, AHU (air handling unit), sluice room, pharmacy room, I.T. room and service elevator

INTENSIVE CARE UNIT:

The ICU cater to patients with most severe and life-threatening illnesses and injuries requiring constant close monitoring and support from specialist equipment and medication to ensure normal bodily functions. There is adult ICU consisting SICU & MICU, paediatric ICU, neonatal ICU, transplant ICU and paediatric cardiac ICU. The nurse patient ratio for critical patients is 1:1 and for stable patients is 1:2. The ICU coordinates with CSSD, Laboratory and the radiology department, strict aseptic techniques are used. Pressure zones are created to control infection rate

THE ICU HAS HIGHLY DEDICATED AND TRAINED MEDICAL, NURSING AND ALLIED STAFF. THERE IS A SYSTEM OF CLOSED ICU IN KDAH. THE SPACE PER BED IS 320SQ FEET IN THE PATIENT CARE AREA

BED CAPACITY IN EACH ICU

ICU	**Bed capacity**
SICU1	11
SICU2	10
PCICU	11
PCICU-HDU	2
PICU	7
TRANSPLANT ICU	7
NICU	8
NICU-HDU	5
MICU	28
MICU	25

Human resource of the ICU

Intensive care doctors

- 1chief intensivist for all ICU
- Junior consultants **(12-hour shift)**
- Clinical registrars (8-hour shift)

I**ntensive care nursing staff**

- 1 director general manager for ICU
- Nurse in charge (8-hour shift)
- Team leader (8-hour shift)
- Senior nurse officers
- Junior nurse officers

Allied staff

- Physiotherapists
- Dieticians
- Biomedical engineers
- Health care assistants

SHIFT TIMINGS:

For doctors

Morning: 8am – 4pm

Afternoon: 2pm – 10pm

Evening: 10pm – 8am

Overlapping hours: 2pm – 4pm

For nurses, HCA and housekeeping staff

Morning: 7am – 3pm

Evening: 3pm – 11pm

Afternoon: 11pm – 7am

Visiting hours: 11am – 1pm

5pm – 7pm

Only 1 relative at a time is allowed

Records and registers

Admission and discharge register

Handling and taking over/team leader sheet

Assignment sheet

Leave book

OT booking register

Critical care flow sheet

Narcotic drug register

EQUIPMENTS:

MONITORING EQUIPMENT	CARDIOVASCULAR THERAPY	RESPIRATORY THERAPY	LABORATORY EQUIPMENT
Bed side and central monitors	CPR Trolley	Ventilators	Blood gas analyser
ECG recorder	Defibrillators	Incubation / tracheotomy trolley	Electrolyte analyser
Pulse oximeter	Infusion pumps and syringes	Nebulisers	
Spiro meter			
ECG monitor			
Temperature monitors			
Blood glucose meter			

Miscellaneous equipment

- Crash cart
- Dressing trolley
- Procedure trolley

Management information system

ICU	LOS (days)
Adult ICU	4
PCICU	6.5
PICU	5.6
NICU	6.4

PAEDIATRIC INTENSIVE CARE UNIT

The PICU looks after all critical paediatric patients. It is located on 8th floor. The ICU is split into 2 zones for outpatients and inpatients. The various other rooms include Ante room, equipment room, clean utility and dirty utility room. The average length of stay of each patient is approximately 1 week.

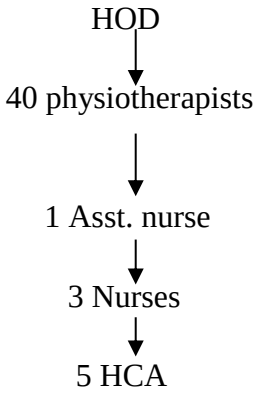
NEONATAL INTENSIVE CARE UNIT

The NICU is 18 bedded and located on 8th floor. The department is divided inton2 zones outpatients and inpatients. There are 2 isolation rooms. The nurse ratio is 1:1.

CENTER FOR REHABILITATION: -

- the center is located on the dedicated floor with 30000 square feet area and exclusive inpatient service, first of its kind.
- The department is located in 7th and 8th floor of hospital.
- It has got its own billing desk.
- It also consists of a day-care center for those patients who need 4-5 sessions in a day.

Staff of the department consists of :



Following therapy services are available: -

1.Neurological Rehabilitation

2.Musculoskeletal Rehabilitation

3.Cardiac Rehabilitation

4.Pulmonary Rehabilitation

5.Paediatric Rehabilitation

6.Cancer Rehabilitation

7.Pain management

8.Women's health

9.Geriatric Rehabilitation

The therapy services offered in the department: -

1.Physical therapy

2.Occupational therapy

3.Electrotherapy

4.Speech and language pathology

5.Exercise physiology

6.Psychology

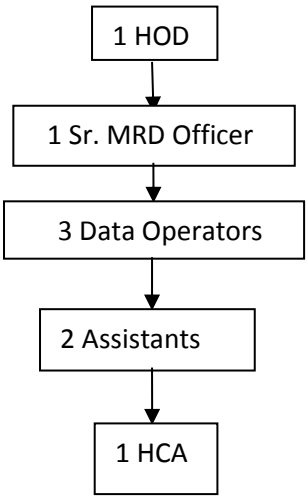
7.Rehabilitation nursing

8.Orthosis and prosthesis

CLINICAL SUPPORT SERVICES

MEDICAL RECORDS DEPARTMENT

- The main functions of the department are:
    1) Storing file for future reference.
    2) Research
- Staff



- Open and closed audit is done of all files before keeping them for storage.
- The arrangement of files is done in following ways:
    - ✓ Year wise and UHID wise

- ✓ Also on the basis of their type:
    a. Regular files
    b. DAMA files
    c. MLC flies
    d. OT recovery files
    e. Chemotherapy files
    f. Dialysis files

- Apart from files few forms and records are also store in this department:
    - ✓ Consent forms
    - ✓ OT papers
    - ✓ A&E Papers
- Certificates issued from the department:
    - ✓ Patient fitness certificate
    - ✓ Fit to fly certificate
    - ✓ Leave certificate
- All files are stored in the department for the following time-period:
    - ✓ Report-1.5 year
    - ✓ Death, DAMA and MLC files 20 years
    - ✓ Regular files-5years
- ICD-10 coding is done for storing files:
    - ✓ Red-Death, DAMA, MLC
    - ✓ Black-Oncology
    - ✓ Yellow-Gynaecology, & obstetrics, IVF files
    - ✓
    - ✓ Dark blue- general medicine, critical care, Nephrology, Endocrinology, Gastroenterology, Pulmonary medicine, Dermatology, Dental, Psychiatry, rehabilitation, Rheumatology.
    - ✓ Light blue- Paediatrics
    - ✓ Orange- Neurology, CVTS, Cardiology, Orthopaedics.
    - ✓ Green- ENT, general surgery, ophthalmology, Urology, Cosmetology, Interventional radiology.
- This department has to notify Bombay Municipal Corporation (BMC) about following things on regular basis:
    - ✓ About Birth & Death report (once in a week)
    - ✓ Notifiable diseases which includes cholera, dengue, plague, yellow-fever, TB, polio, meningococcal meningitis, leptospirosis, viral encephalitis(once in a week).
    - ✓ Maternal mortality (once in a week)
    - ✓ MTP & PNDT (once in a month)
    - ✓ Retrieval- for easy retrieval of files tracer cards are used when files are given to patients or sent outside the department.

LABORATORY: -

The salient features of the department are as follows-

- CAP (College of American Pathology) accreditation
- Central processing laboratory is spread over 40,000sq.Ft. which follows strict internal quality compliance for all analyzer.
- Excellent laboratory management system which handles both pre-analytical and post-analytical aspects
- Dedicated courier and logistic services
- 24 hrs. sample collection facility
- Stringent quality control monitoring which satisfy the quality assurance elements elaborated by GLP and GCP and readily available documented evidence of quality assurance and quality proficiency schemes
- Constant improvisation and technology innovation using over 150 state of the art equipment.
- Quality control and quality assurance executive that monitors pre-analytical and post-analytical processing of the samples.
- Customized management report (MIS-management information system)
- An active IRB and ethics committee which oversees clinical trials proposed when required.

BLOOD BANK: -

Transfusion medicine is a multi-displinary area concerned use of blood and blood component in the treatment of human disease. The mission of KDAH is to make available appropriate adequate quantity and high quality of safe blood and blood component to "anyone, anytime, anywhere" in medical community. KDAH adheres to quality norms and focus on the donor satisfaction standards and technique and quality control are precisely and meticulously maintained as per norms given in the drugs and cosmetics acts, by the regulatory authority, director drug controller (India), ministry of health and family welfare, Govt. of India, and internationally recommended methods. The department runs round the clock and blood and its products are supplied as and when requested. Blood donation is accepted from voluntary blood donors and relatives and friends of the

patient. Autologous blood donation (blood donation from one's own use) is also accepted. The blood donors are informed and educated about the infection transmitted by transfusion of blood components. mandatory screening for the transfusion transmissible disease like HIV, HBV and HCV is done here along with CMLIA and ELISA methods.All units are screened for VDRL and malaria parasite.

IMAGING: -

The imaging department consists of radiology services.The investigations performed in these departments includes:

- CT Scan
- MRI
- X-RAY
- Ultrasound
- Mammography

The HIS has a system for appointment scheduling for each of these investigations.The appointments are given by Call Centre.There are 4 X-ray machines,5 ultrasonography machines ,1 mammography machine,1 CT Scan machine,& 2 MRI machine of which one is 3 Tesla located in the radiology department and the other is 1.5 Tesla IMRIS (intraoperative magnetic resonance imaging suit)is a movable machine attached to the ceiling that is located in the OT.It is basically used for MRI scanning during a surgery.They are working on its complete utilization.

CENTRAL STERILE SUPPLY DEPARTMENT: -

The central sterile supply department (CSSD)plays a key role in providing the items required to deliver quality patient care. Centralizing the reprocessing of reusable devices helps ensure uniform standards of practice, while also providing for improved workflow (soiled, to clean, to sterile. Every CSSD task must be performed for the welfare and safety of patients-workers and the community.

CSSD is the heart of hospital infection control and the most important unit of clinical support services.

INFRASTRUCTURE: -

It is divided into 3 zones

1.Decontamination area

2.Assembly area

3.Sterile storage area

STAFF: -

- 1 manager/department head
- 1 executive
- 1 senior technical officer
- 4 technical offiers
- 6 junior technical officers
- 10 trainees
- 16 health care attendants

MAJOR TECHNOLOGIES: -

- Ultra-sonic cleaner
  Washer disinfectant
- Dryer
- Steam sterilizers
- Plasma sterilizers
- ETO (ethylene oxide gas sterilizer)
- Dry heat sterilizer

RECORD MAINTAINED: -

- Manual issue and receiving OT
- Manual issue and receiving all departments
- Sterilization records

PHARMACY: -

Central pharmacy indents to IP, OP and LB. it is of 2 categories: capital and consumables.

SCOPE OF INVENTORY MANAGEMNET:

- INDENTATION
- RECEIVING
- STORING
- DISTRIBUTION

The staff consists of: -

- 5 managers
- 1 executive
- 8 senior officers
- 24 officers
- 7 junior officers
- 6 trainee assistants
- 1 trainee HCA
- 16 attendants
- 21 HCA

HOUSE KEEPING:

The objective of housekeeping is exceptional standards of cleanliness, sanitation and hygiene of the entire hospital. Housekeeping services are outsourced to ARA MARK services

The staffs include: -

- Housekeeping manager
- Assistant manager
- Housekeeping executives
- Supervisors
- Houseboys & house girls

Function of housekeeping department are: -

- General facility cleaning
  - ✓ Routine cleaning of patient's rooms
  - ✓ Patient's common areas

- ✓ Washrooms
- ✓ OT
- ✓ Laboratory
- ✓ Consultant's office
- ✓ Glass windows and doors
- ✓ Ceiling etc.

- Handling of biomedical waste.
- Pest control-It includes sprayingevery 24 hours for mosquitoes,cockroaches,flies,rats,lizards and termites.
- Garbage disposal-The housekeeping staff collects garbage bins existing inside the hospital premisesand disposes the garbage at the designated area within the hospital,which is the biomedical waste room.The general waste is sold to the junk dealer and healthcare waste is handed over to government approved vendor "synergy waste management".
- Horticulture-It is responsible for maintainence of house plans & terrace gardens,flower arrangement during hospital functions.

The performance indicators are B.M.W color code compliance,B.M.W collection,pest control efficiency and sanitization of the hospital premises.

CLINICAL ADMINISTARTION SERVICES

STORES

Material stores functions to supply the right material in right quintiles at the right time at the right price. The IP departments put up requests for the required materials by uploading indents in the HIS. The store manager raises a purchase order to be sent at the central procurement stores. The supplies received are inspected based on quantity and expiry in the incoming material inspection area. The items are stored as per the storage norms. Departmental issues are made for non – medical consumable as per requirement. Stock is reviewed periodically for non-moving items and short expiry items. Stock audits are carried out twice/year. Any variance is reported to the higher management. For inventory control, ABC and VED analysis is carried out. FIFO (first expiry first out) is followed. The staff includes:

- Assistant Manager
- Executive store
- Assistants
- 2 Health care assistants

The key performance indicators are no stock outs, zero errors in maintenance of accounts, zero error is billing processing maintain minimum inventory maximum efficiency, maintaining stores as per the NABH – ISO standards, submission of bills accounts within 4 working days, expired items on the shelves should be zero, minimize emergency purchase, TAT suture and lab kits (19 days), instruments (8 weeks) and other items (2 days)

LINEN AND LAUNDRY

The objective of linen and laundry is the availability of clean uniforms for patients and staff. Soiled linen when collected is kept in the dirty utility room in a hamper trolley. Infected linen is collected and put in a red bag at the source4 of generation. The red bag is sealed and labeled for infection. At the end of each shift, the dirty utility linen is carried in the hamper trolley to the collection room. At the collection point, it is segregated, counted and sent to the laundry for washing. The performance indicators are laundry pending, turnaround time for laundry cleaning, percentage discarded linen.

BIOMEDICAL ENGINEERING DEPARTMENT

The main objective of the department is to facilitate the usage of latest technologies in the diagnosis, treatment of care of patients. It is also responsible for proper usage and quality performance of these costly equipment and tools inside the hospital

The departments maintains an updated asset register of the hospital equipment, conduct daily rounds to ensure that the equipment is functioning smoothly, responsible for facilitation and identification of equipment requirements, planning technical comparison, ordering installation and deployment units and new projects, conduct regular preventive maintenance servicing for all the equipment at regular intervals, facilitating equipment replacements and condemnation, whenever required, conducting regular training programs for hospital staff, on usage of hospital equipments. The staff consists of HOD, 5 biomedical engineers and 2 biomedical technicians and 4 medical gas technicians.

FOOD AND BEVERAGES

The objectives of food and beverages department are to deliver healthy and nutritious meals coupled with a wonderful with a wonderful experience of hospitality services to all IP, OP and staff. The cafeteria is outsourced to java green. The main functions of the department are as follows:

- Impatient meal management
- Purchase of fruits, vegetables, milk, pulses, whole grain and other dietary consumables
- FIFO is followed

The purchased items are unloaded in the receiving area, where they are inspected and then washed with water and anti-bacterial liquid before bringing it in the kitchen premises. It is followed by storage of perishable and non-perishable items in refrigerator and dry storage area respectively. Diet planning and counseling is done by the dietician according to the patient's condition, food allergy and taste and general preference. The diet summary is handed over to the supervisor in the form of meal sheet cum ticket. According to this, the food is prepared and laid out

on trays. The meals are served in the patient's room and clearance is carried out after 2 hours. Food/meal/diet for a patient admitted in the hospital is decided by the doctor admitting the patient depending on his/her medical condition. On doctor's recommendations, the dieticians plan the meal that is best fir the patient 'speedy recovery. The staff includes:

- Regional head of support function
- F&B managers cum chef
- Assistant manager F&B staff

SECURITY

Services rendered by security department are surveillance and patrolling of the infrastructure and material, access control (in restricted areas like IT, MRD, LSS, Mortuary, Pharmacy, Electric control panels), control of movement of traffic in premises, reception and conduct of visitors and attendants, assistance in fire control and emergency plan, vigilance and intelligence, liaison with sensitive areas, carry out verification, hold records, issue passes, and generate reports on security matters, it is equipped with modern equipment like CCTV's metal and explosive detectors, alarms, security, lighting and walkie-talkies, etc. the staff members are:

- HOD
- Senior officer
- Security supervisor
- Sr. security assistant
- Security guards

The performance indicators are TAT, theft percent, code related incidents.

ADMINISTRATIVE SERVICES

ADMISSION AND BILLLING:

The admission and billing staff includes 1 H.O.D and 12 employees. The services offered by the department are registration of a new patient, booking/reservation –bed and O.T, admission, billing, discharge work.

Front office:

The front office is the first point of contact at KDAH. It is manned by duty manager, deputy duty manger and patient care executive and patient care coordinator. There are total 7 front offices in KDAH and there are 2 help desks.

Functions:

- Respond and answer telephone calls from patients and clients (call center).
- Registration of outpatients and executive health checkup patients for various investigations (registration counter).

- Admission, billing and discharge of in patients.
- Direct the patient and their relatives to the outpatient services and the inpatient wards (helpdesk and welcome desk).
- Report receiving and handling over to the patient (dispatch counter).

Third Party Administrator Desk:

TPA Staff includes one executive clinical administrator and 4 customer care officers.

Functions:

- Counseling
- Pre- Authorization
- Cashless admission
- Query Handling
- Final approval
- Maintain privacy and confidentiality

INFORMATION TECHNOLOGY DEPARTMENT

It is implied that there is central database for entire hospital. Services rendered by the IT department are as follows:

- IT support to location users for hardware and software as per SLA (service level agreement).
- Installation of new IT equipment.
- Helping biomedical department in configuring the medical equipment with HIS.
- Installation of appointment scheduling programs.

The IT staffs include:

- Chief information officer
- Manager IT
- Executive IT engineers

The performance indicators are calls resolutions within a time limit, strict data security, zero percent variance, in hardware and software variance, minimal occupational hazard and proper e-waste disposal.

ENGINEERING DEPARTMENT:

Engineering and maintenance department is manned for 24 hours for keeping round the clock vigil on proper functioning of plant engineering equipment coming under the purview of department. This

covers maintenance of major supplies to the hospital such as power, water, which form the life line to the hospital's activities. The responsibilities of the department include operation and maintenance of plant equipment installed in the basement of main building and various other areas to support the normal functioning of the hospital and repair work of equipment related to the department's responsibility. The policy of the department is to serve well with safety and it time, continuous improvement, cost saving, optimum utilization of manpower and equipment, optimum utilization of inventory and teamwork.

The major engineering services are:

- Electrical power supply- normal and emergency.
- Air conditioning, ventilation and refrigeration.
- Steam and hot water supply.
- Water stations and cold-water supplies- filtration system.
- Medical gases supplies
- Fire detection alarms and fighting system.
- Internal and external plumbing system.
- Civil works- masonry, carpentry, glasswork, upholstery, painting etc.
- PNG and LPG supply
- Safety assessment of facilities.

MARKETING AND SALES:

Marketing and sales department is concerned with business development, branding, promotions and advertisement of KDAH healthcare services. Marketing deals with organizing health checkup camps and awareness talks for corporate or PSUs and RWA, designing all the brochures and signage, pitching referral sales from nearby general practitioners and nursing homes, liaison with TPAs and managing the international patients (medical tourism).

FINANCE:

The scope of services includes the entire hospital cash handling and cash disbursement in the form of salaries and vendor payment for stores, pharmacy and biomedical department. All the cash collected is deposited on daily basis of the bank. The TPA payment is collected through lump sum amount in the form of cheque at the end of the month. The staffs include:

- HOD
- Assistant Manager
- Senior executives
- Junior executives
- 2 cashiers

HUMAN RESOURCE DEPARTMENT:

The functions of HR department at KDA hospital are:

- Hiring
- Physician and nurse recruitment
- Employee orientation
- Personal management
- Benefits and compensation management
- Counseling
- Claims handling
- Training and performance monitoring
- Professional development programs
- State and federal regulations education
- Work place safety and sanitation
- Administration – employee meetings
- Staff morale and retention

Recruitment / selection:

- Identifying the key requirements areas (KRA)
- Drafting job description
- Recruitment through job portals and internal references
- Selection
- Medical examination of the candidate
- Offering letter to the selected ones

PURCHASE DEPARTMENT:

Purchasing department is responsible for the procurement of function of the hospital.

QUALITY CONTROL DEPARTMENT

The Functions of the department are:

- To analyze patient feedback forms.
- To analyze different parameters from different departments and compare them.
- Infection control of the hospital.
- Induction and training of hospital staff.
- Accreditations (NABH, JCI).

This department also maintains few quality indicators for hospital:

- Medication Errors
- Return of patient within 72 hours.
- Return of patient to ICU within 48 hours.
- Return of patient to OT within 48 hours.
- Number of Needle sticks Injuries.
- Number of blood transfusion reaction.
- Number of Adverse Drug reaction.

STAFF: -

This department consists of 1 quality manager who reports directly to the director of hospital.

SUMMER TRAINING

DMAIC APPROACH TO REDUCE THE WAITING TIME IN OUT PATIENT DEPARTMENT OF KDAH

INTRODUCTION

Patients' waiting time has been defined as "the length of time from when the patient entered the outpatient clinic to the time the patient actually leaves the OPD".
It's often one of the most frustrating parts about healthcare delivery system.
Waiting times for health care have been considered a fundamental problem in many health care systems as it proves to be a hindrance to efficient patient flows.
OPDs is considered as the window to hospital services and a patient's impression of the hospital begins at the OPD. This impression often influences the patient's sensitivity to the hospital and therefore it is essential to ensure that OPD services provide an excellent experience for customers.

The average delay observed in most of the public hospitals in India is usually 2 to 3 hours. The reason behind delay in public hospitals are: Shortage of doctors, poorly managed X ray machines, Lack of quality services provided by the medical staff, Untrained professionals.

The reasons behind delay in private hospitals are: Patients reaching late to the hospitals, Lack of proper sign boards for different departments, Patients hesitating to take help from the help desks, some departments like paediatrics, geriatrics taking longer time to serve the patient because of the nature of the patients they treat.

The average delay observed in most private hospital is 30 to 60 minutes.

LITERATURE REVIEW

The search was limited to full paper articles published in English. However, this review gives a broad reflection of substantial research performed across different countries including Indian Studies

Six Sigma which was originally developed by Motorola, USA in 1986 is a business management strategy and was associated with statistical modeling of manufacturing processes. A six-sigma process is one in which 99.99966% of the products manufactured are statistically expected to be free of defects (3.4 defects per million).

Six Sigma helps to improve the quality of process outputs by identifying and removing the causes of defects (errors) and minimizing variability and errors in the work process.

The outpatient services often are the first point of contact with a hospital. It is an extremely busy area as all the patients must pass through this area. It is important that it is well managed, as the first impressions of any hospital is moulded get during this process. Some of the major management issues in outpatient management are waiting time, communication problem, employee behaviour and the layout of the OPD department.

(Sharon **Silow-Carroll, M.B.A., M.S.W)**

ZHU Zhecheng; HENG Bee in 2002:

This paper is focused on the factors causing long patient waiting time/clinic overtime in outpatient clinics and how to tackle them with efficency. A two-week period of data collection is conducted in an outpatient clinic of a Singapore government hospital. An outpatient department is known as a private or public healthcare facility which is concerned to diagnoses and treatments of outpatients.

Services of Clinical consultations are provided to patients in OPD. The consultations include history taking, clinical examination, diagnosing and providing prescription to patients. The support of diagnostic might be required to confirm the diagnosis and proceed with treatment planning. Minor surgeries or procedures are also carried out in the OPD. Along with the curative services, certain preventive services like immunization; promotive services like dietary counselling and rehabilitative services like physiotherapy and occupation therapy are also provided in OPD of many hospitals.

RATIONALE:

An outpatient is a key area for most of the patients visiting hospital. It is usually the intersection point of patient's pathway where different pathways intersect, like diagnostic tests, radiology tests etc.

The outpatient waiting list is dynamic and may differ from department to department. So, the purpose of this project is to study the key issues which cause the average delay in timings of the OPD in 4 different departments (Endocrinology, orthopaedics, Oncology and General OPD) of Kokilaben Dhirubhai Ambani Hospital, Mumbai and suggest valid recommendation based on the analysis done through Six Sigma Approach.

RESEARCH QUESTIONS:

- What does the process of patients flow in OPD?
- What is the average waiting time in different departments OPD of KDAH?
- What are the causes of delay in waiting time of Out Patient Department?

- Do the causes differ in different departments based on their functioning:
- How can the delay in appointment timings in OPD patients be managed effectively and efficiency?

AIM

To reduce the waiting time of patients in Outpatient Department of some of the departments of KDAH.

OBJECTIVES

- To determine the average delay in OPD of 4 departments of KDAH.
- To study the determinants of patient's waiting time in OPD of KDAH.
- To analyse and prioritize the causes which are leading to increase in waiting time of patients in OPD at KDAH.
- Based on the analysis using six sigma approaches, suggesting measures to reduce the waiting time of OPD patients which are economically viable, environmentally sound and socially responsible.

METHODOLOGY

- **STUDY DESIGN**

Cross sectional study with convenience sampling

- **STUDY SETTINGS**

The study was conducted in the OPD of 4 different departments of Kokilaben Dhirubhai Ambani Hospital, Mumbai. The departments in which the study was conducted were as follows:

- Endocrinology Department (2^{nd} floor)
- Orthopaedics Department (1^{st} floor)
- Oncology Department (2^{nd} floor)
- General OPD Department (1^{st} floor)

A convenience sampling method was used in the study.

SAMPLE SIZE

A sample size of 2000 from 4 different departments were used during the study.

Duration: 1 month

DEPARTMENTS	SAMPLE SIZE
ENDOCRINOLOGY	385
ORTHOPEDICS	198
ONCOLOGY	516
GENERAL OPD	1000

DATA COLLECTION

Quantitative data was collected. Patient's name, UHID number, appointment timings and the actual delay from appointment timings along with the reasons of delay were calculated and recorded daily in MS EXCEL sheets.

- The timing for collecting the sample size was from 9:00 AM to 8:30 PM for one month.
- Appointment sheets of doctors of concerned department was collected from the respective CCO every morning.
- Patient tracking was done based on the patient's appointment timings and were matched with the appointment sheet.
- The exact timings when the patient entered in the consultancy room and left the consultancy room was noted.
- It was matched with the given appointment timings.
- With the help of this, the average delay in the waiting timing for each department was noted down.
- With the help of this data control charts were prepared.

ANALYSIS PLAN

Analysis was done with the help of DMAIC (define, measure, analyse, improve, control) which is a part of six sigma approach.

Due to time constraint DMAIC approach was done till analysis only as improve and control phase takes minimum of 6 months and our internship was for two months.

DMAIC approach to reduce waiting time of the process of Out Patient Department

The DMAIC method under Six Sigma which consists of the following five steps was used to achieve the objectives of this study.

1 – Define 2 – Measure 3 – Analysis 4 – Improve 5 – Control

The study was conducted in four different departments mentioned in KDAH.

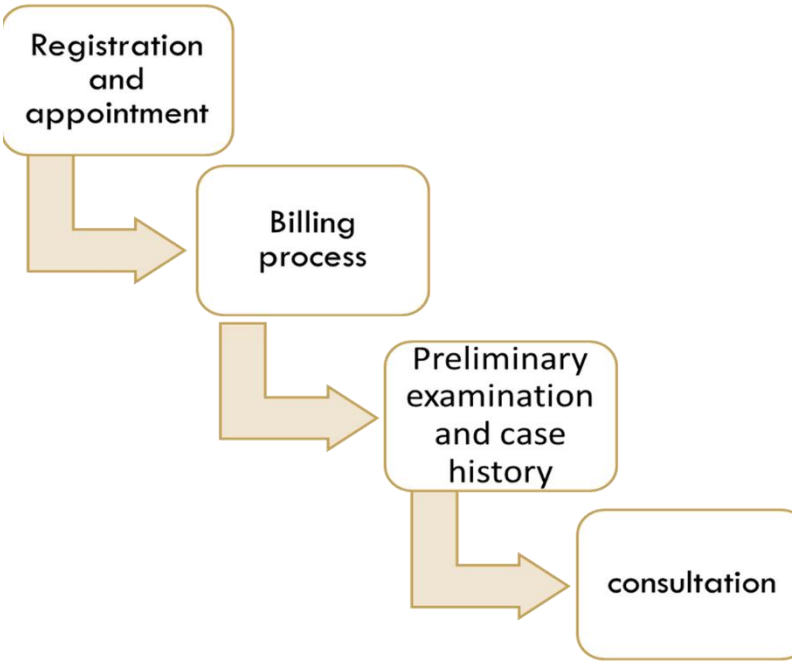
- **DEFINE**

This is the first step that refers to defining the goals of the project. The goal has to align the customer demands and the strategic goals of the organization. This step include defining the whole process flow of any system. Here, along with defining the process flow the whole business model is also being defined with the help of SIPOC analysis.

PROJECT CHARTER

<table>
<tr><td colspan="5">Project Title: DMAIC approach to reduce TAT of OPD process.</td></tr>
<tr><td colspan="4">Problem statement</td><td>Opportunity statement</td></tr>
<tr><td colspan="4">➢ TAT of OPD process higher than standards.
➢ Long waiting time of patients</td><td>➢ Doctors come late
➢ CCO not present
➢ Queue in billing counter
➢ Patients come late
➢ Doctors not available due to IPD rounds</td></tr>
<tr><td colspan="4">Goal Statement</td><td>Project scope</td></tr>
<tr><td>DEPARTMENTS</td><td>CURRENT LEVEL</td><td>Goal/Target</td><td>Target Date</td><td rowspan="2">Process under improvement: in 4 departments: Endocrinology, Orthopedics, Oncology and General OPD
Starts with: 4.04.17
Ends with :10.05.17</td></tr>
<tr><td colspan="2">Endocrinology 75 MINS
Orthopaedics 29 MINS
Oncology 49 MINS
General OPD 43 MINS</td><td>15 MINS
15 MINS
15MINS
15 MINS</td><td>5.05.17</td></tr>
<tr><td colspan="5">Project Plan</td></tr>
<tr><td>Phase</td><td colspan="2">Start</td><td>End</td><td>Remarks</td></tr>
<tr><td>Define</td><td colspan="2">04.04.17</td><td>05.05.17</td><td>Completed within time</td></tr>
<tr><td>Measure</td><td colspan="2">06.05.17</td><td>07.05.15</td><td>Completed within time</td></tr>
<tr><td>Analyse</td><td colspan="2">8.05.17</td><td>10.05.17</td><td>Completed within time</td></tr>
<tr><td>Improve</td><td colspan="2"></td><td></td><td></td></tr>
<tr><td>Control</td><td colspan="2"></td><td></td><td></td></tr>
</table>

THE PROCESS FLOW OF OPD DEPARTMENT



PROBLEM DESCRIPTION

PROBLEM	CUSTOMER IMPACT	BUSINESS IMPACT
Delay in consultation process of Out Patient Department	Customer Dissatisfaction	Reduced number of patients treated per day
	Increased waiting time of patients	Poor Brand image
	patient not treated as per their appointment timings	Loss of revenue
	Long waiting line of patients	

SIPOC

SIPOC (suppliers, inputs, process, outputs, customers) is one of many visual tools used for documenting a business process from beginning to end.

Suppliers	Inputs	Process	Outputs	Customers
REGISTRATION STAFF	REGISTRATION	REGISTRATION AND APPOINTMENT DATE	UHID NUMBER AND APPOINTMENT	PATIENT
BILLING STAFF	CASH	BILLING	GOES TO THE CONCERNED DEPARTMENT	PATIENT
NURSES/JR. DOCTOR	DETAIL INFORMATION OF PATIENT	PRELIMINARY EXAMINATION/CASE HISTORY	PAITIENT WAITS FOR CONSULTATION	PATIENTS
DOCTORS	PRESENT COMPLAIN	CONSULTATION	PLAN FOR TREATMENT	PATIENT

MEASUREMENT

This phase refers to the analysis of the existing system with various measurement techniques for the defects and levels of perfection that exist. The level of perfections are shown with the help of control charts.

Process / Input (X)	Data source and location	Sample size	Who will collect the data	Data Collection	How will data be collected	Other data that should be collected at the same time
OUT PATIENT DEPARTMENT of KDAH	Source: Endocrinology Orthopedics Oncology General OPD	2000	Monica Udenia	04.04.17 to 5.05.17	Manual	

RESULTS

AVERAGE DELAY IN EACH DEPARTMENT

DEPARTMENTS	AVERAGE	STANDARD DEVIATION
ENDOCRINOLOGY	75 MINS	52
ORTHOPEDICS	29 MINS	20
ONCOLOGY	49 MINS	43
GENERAL OPD	43 MINS	31.1

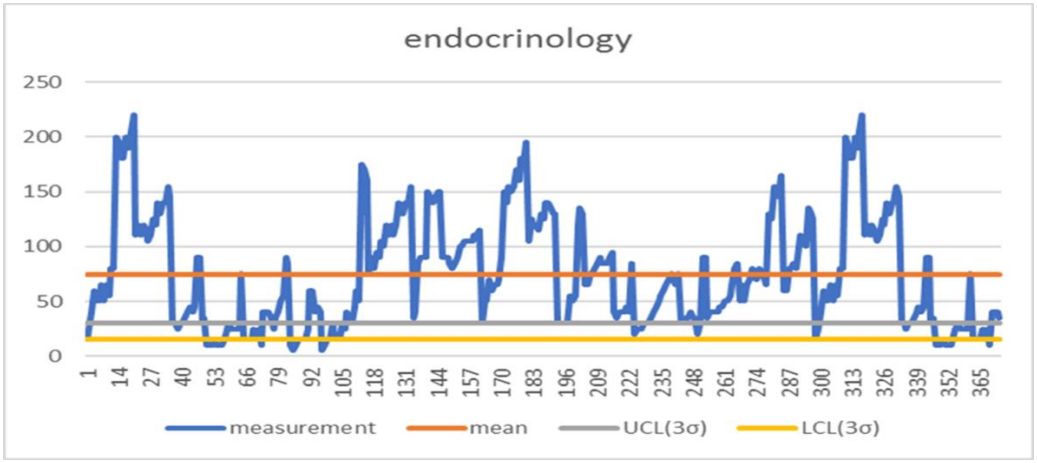
DPMO AND SIGMA LEVEL

OUTPUT INDICATOR	NO. OF UNITS	NO. OF OPPORTUNITIES PER UNIT	NO. OF DEFECTS	DPMO	SIGMA LEVEL
ENDOCRINOLOGY	385	4	360	233766	2.23
ORTHOPEDIC	198	4	153	193181.8	2.37
ONCOLOGY	516	4	223	108042	2.74
GENERAL OPD	1000	4	665	166250	2.47

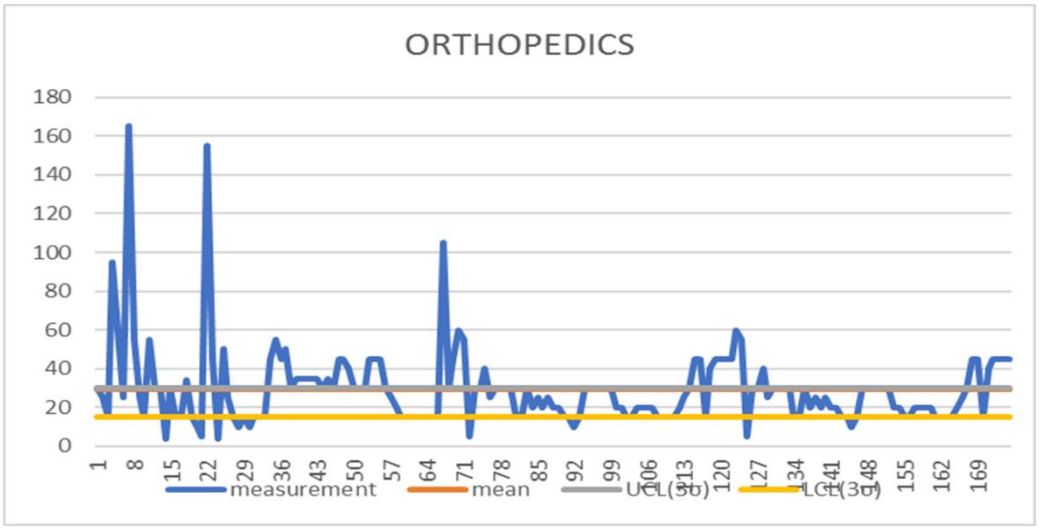
CONTROL CHARTS

Control charts are designed based on the present data collected i.e before the improve phase.

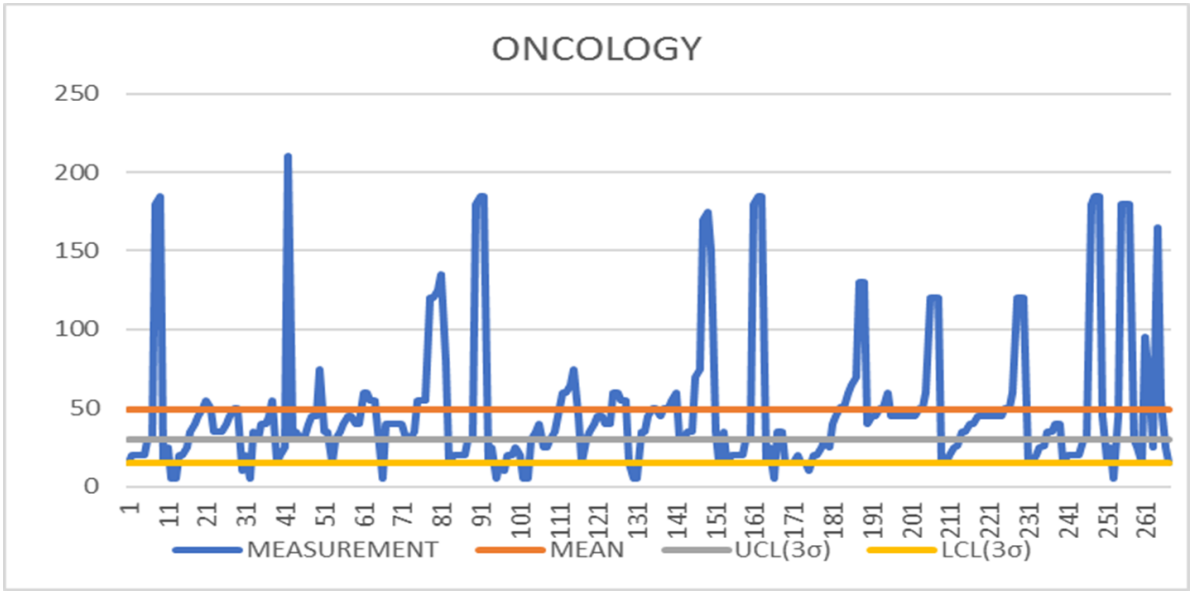
- **ENDOCRINOLOGY DEPARTMENT**



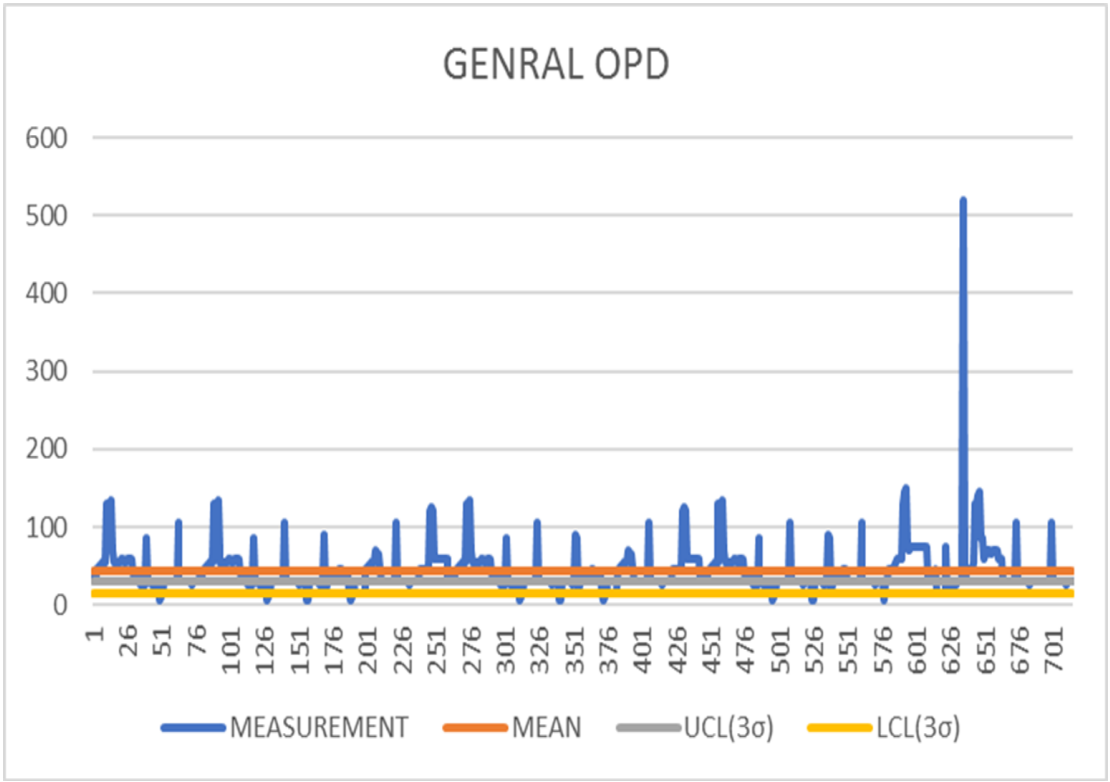
- **ORTHOPEDIC DEPARTMENT**



ONCOLOGY DEPARTMENT



- **GENERAL OPD**

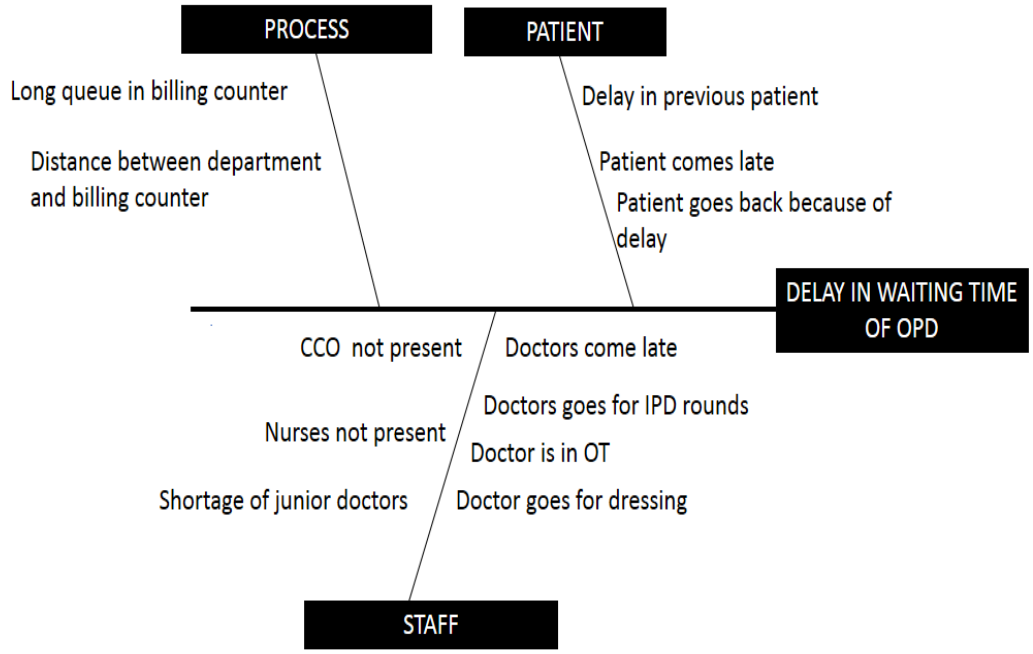


ANALYSIS

ROOT CAUSE ANALYSIS

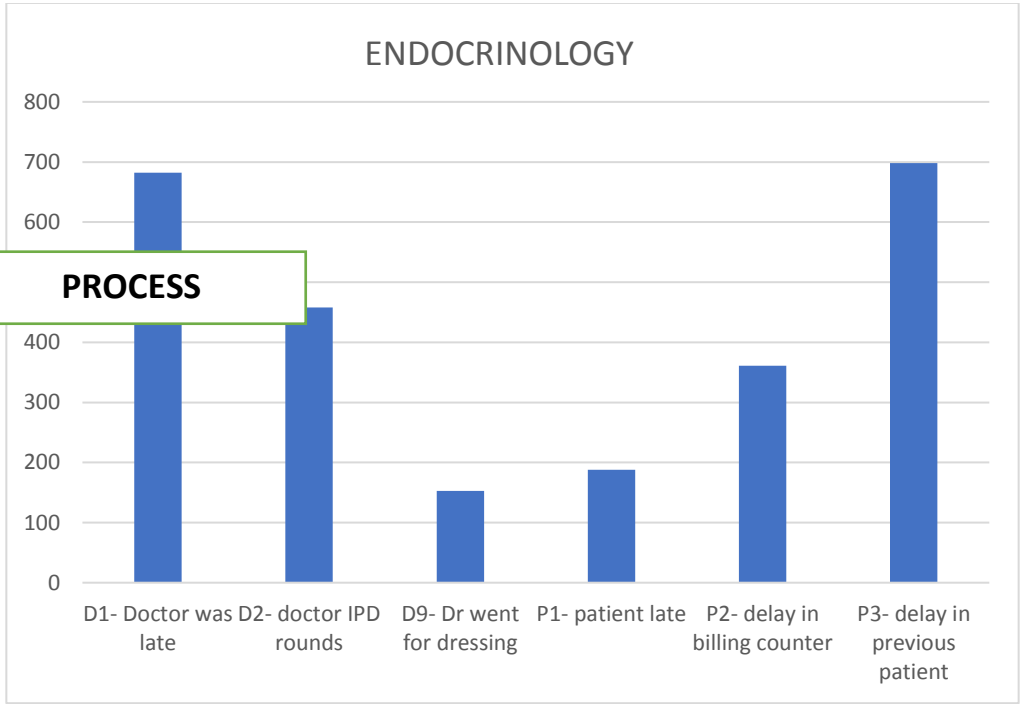
FISH BONE DIAGRAM

A **fishbone diagram**, also called a cause and effect **diagram** or Ishikawa **diagram**, is a visualization tool for categorizing the potential causes of a problem to identify its root causes.



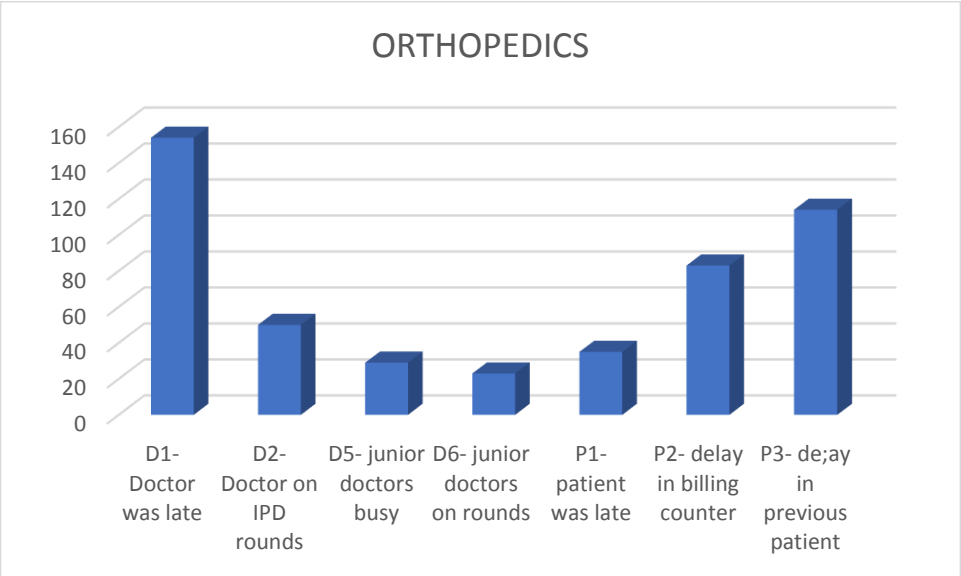
MAJOR REASONS FOR DELAY

ENDOCRINOLOGY DEPARTMENT



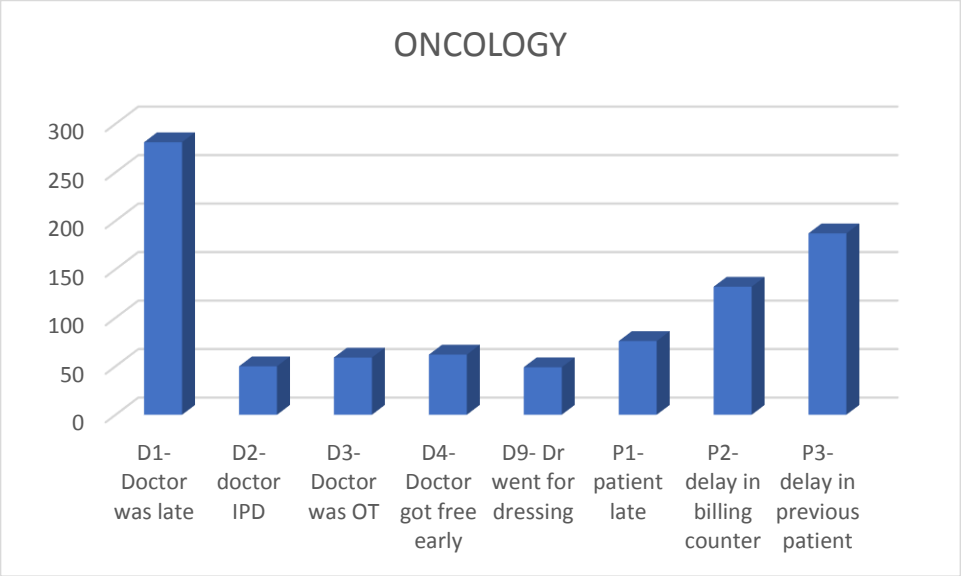
REASONS	ENDOCRINOLOGY
D1- Doctor was late	682
D2- doctor IPD rounds	458
D9- Dr went for dressing	153
P1- patient late	188
P2- delay in billing counter	361
P3- delay in previous patient	698

ORTHOPEDICS DEPARTMENT



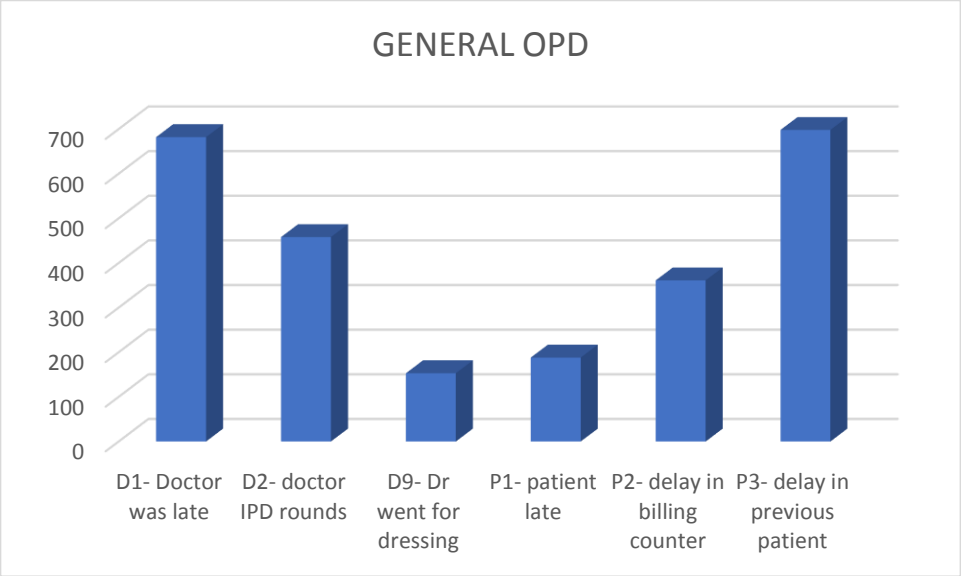
REASONS	ORTHOPEDICS
D1- Doctor was late	154
D2- Doctor on IPD rounds	50
D5- junior doctors busy	29
D6- junior doctors on rounds	23
P1- patient was late	35
P2- delay in billing counter	83
P3- de;ay in previous patient	114

ONCOLOGY DEPARTMENT



REASONS	ONCOLOGY
D1- Doctor was late	281
D2- doctor IPD	50
D3- Doctor was OT	59
D4- Doctor got free early	62
D9- Dr went for dressing	49
P1- patient late	76
P2- delay in billing counter	132
P3- delay in previous patient	187

GENERAL OPD



REASONS	GENERAL OPD
D1- Doctor was late	682
D2- doctor IPD rounds	458
D9- Dr went for dressing	153
P1- patient late	188
P2- delay in billing counter	361
P3- delay in previous patient	698

RECOMMENDATIONS TO DECREASE THE WAITING TIME.

(based on the over study findings)

- **DOCTORS**

- Doctors need to be made aware of the problems occurring in the department because of their daily delay in reporting to hospital
- Specific timings should be scheduled for IPD rounds(except for emergency), no OPD appointments should be scheduled during that time.
- More number of Junior doctors need to be posted in departments like Endocrinology where taking case history is an important part of OPD process.

- **PATIENTS**

- **Reminder calls and messages** should be sent to patients one day before their appointments.
- Making the Patient's waiting time more comfortable by introducing **charging stations in OPDs, adding games like sudoku, crossword puzzles etc. along with magazines and brochures.**
- **Television** is also an effective way of passing time during the waiting hour.

- **PROCESS**
- Need of more billing counter on 1st and 2nd floor to avoid long waiting queue for billing.
- The billing counters should be closer to the OPD departments to reduce patient's time.
- Mobile queue tools are a great way to keep wait times down and patients happy. Applications like Qless give projected wait times and allow patients to let your staff know if they're running behind.
- LED electronic display boards can be displayed in the OPD areas so as to avoid repeated inquiry about patient's turn at the reception.

CONCLUSION

The study has brought to surface certain grey areas mentioned above which need improvement to increase the efficiency of the system and cater more and more to patient's satisfaction. Time wastage reduction by elimination of certain unnecessary movements can greatly improve the services of the OPD at KDAH.

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- Reducing waiting time in Outpatient services of large University teaching hospital- Six Sigma Approach by Prof. Dinesh T.A, Prof. Dr. Sanjeev Singh , Prem Nair, Remya TR.
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