Summer Training at

Kokilaben Dhirubhai Ambani Hospital/Organization
(April 1–May 31, 2014)

Optimising Utilisation of ICU Beds in 750 Bedded Multispecialty Hospitals

By
Nilisha Nathani

Under the guidance of
Dr. Santosh Kumar

MBA- Hospital & Health Management (MBA-HM)
2013-2015

The IIHMR University, Jaipur
2014

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CERTIFICATE

This is to certify that **Dr.Nilisha Nathani** has undergone her summer training in **Kokilaben Dhirubhai Ambani Hospital, Mumbai,** from 1st April, 2014 to 31st May, 2014. The candidate herself carried out all the studies related to her summer training. Her approach to the study has been scientific and analytical. This summer training is in the partial fulfilment of the course requirement recommended for the award of Post Graduate Diploma in Hospital and Health Management with specialisation in Hospital Management.
I wish her success in all her future endeavours.

Col. (Dr.) Ashok Kaushik
Dean (Academic & Student Affairs)
IIHMR Jaipur

Dr. Santosh Kumar
Associate Professor
IIHMR Jaipur

Kokilaben Dhirubhai Ambani
hospital & medical research institute

Every Life Matters

30 May, 2014.

To Whom It May Concern.

Dr Nilisha Nathani, a First Year student of the Post Graduate Diploma in Hospital Administration at The Institute Of Health Management Research in Jaipur, India did her Summer Internship for 2 months at The Kokilaben Dhirubhai Ambani Hospital, Mumbai, India from 1st April, 2014 to 30th May, 2014.

I found her to be a meticulous and hard working student who did good quality project work.

She will go a long way in her career in the Hospital Industry and would be an asset to any Organization.

I wish her all the very best in the future.

Yours Sincerely,

Dr Ram Narain,

Executive Director.

KOKILABEN DHIRUBHAI AMBANI HOSPITAL MUMBAI

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Acknowledgements:

With immense pleasure I express my heartful gratitude to the Director of IIHMR Jaipur, Dr.S.D.Gupta, and Dean, and my mentor Dr. Santosh Kumar for having given me this opportunity to undergo training.

I am extremely indebted to all the professionals at Kokilaben Dhirubhai Ambani Hospital (KDAH)for sharing generously their knowledge and precious time which inspired me to do best during summer training .I owe a great debt to chief executive officer (KDAH) for providing me an opportunity to work as a training in their organization. I would like to thank Dr. Md.FaisalPervez(senior manager, clinical administration),mentor for the summer training in KDAH, without whose help it would not have been possible for me to understand the hospital to the extent as I have now. I am highly grateful to all the staff of Intensive Care Unit for their cooperation which enabled me to complete my special assignment in the department.

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

Table of Contents:

Acronyms/Abbreviations:

- A&E - Accident and Emergency
- DAMA -Discharge Against Medical Advice
- HCA -Health Care Assistant
- ALOS -Average Length Of Stay
- CMD – Chief Medical Director
- 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 Resources 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.
- IPD – In-patient Department
- KDAH – Kokilaben Dhirubhai Ambani Hospital
- MRD – Medical Records Department
- MLC – Medico Legal Case
- NICU – Neonatal Intensive Care Unit
- OPD – Out Patient Department

About Summer Training:

The Post Graduate Diploma in Health and Hospital Management (PGDHM) program of Institute of Health management Research (IIHMR) aims at preparing professionally trained managers of health care organizations and hospitals to meet the increasing need for managerial skill. It involves a eight week summer placement for the first year students to provide them with a firsthand experience of the hospital system or environment. As a part of the program I had the privilege to undergo my practical training at Kokilaben Dhirubhai Ambani Hospital, Mumbai to get a firsthand knowledge and experience about the functioning of the hospital. I worked all through under the operations team there from 1st April 2014 to 31st May 2014. The main aim of the summer training was to get exposed to operation of all the hospital in general, and an in-depth insight of the Third Party Administrator, Pharmacy, medical Record Department and Laboratory in the hospital in particular.

Objective:

The summer training program had the following objectives:

- To have a basic orientation of the hospital set up.
- To study the functioning of the hospital as a system and its departments as subsystems of the hospital.
- To observe all the department in terms of their location,work plan and staffing pattern.
- To study about the staffing pattern and job responsibility of staff.
- Doing a project which is helpful to me in understanding hospital working in a better way and to the organization.

METHOD OF DATA COLLECTION:

The data collected was primary and secondary data.

Primary data was collected by:

- Personal observation during the summer training and department visits.
- Further information was gathered by discussion with the department heads and staff on the basis of unstructured interview.

Secondary data was collected from:

- The past records and hospital management information system (HMIS).

Profile of KDAH

The Institution

Kokilaben Dhirubhai Ambani Hospital & Medical Research is India's newest, most advanced tertiary care facility. As the flagship social initiative of Anil Dhirubhai Ambani group, it is designed to raise India's global standing as a healthcare hub, with emphasis on excellence in clinical services, diagnostic facilities and research.

A vision to strength en healthcare in the communities we serve and empower patients to make informed choices was at the genesis of Kokilaben Dhirubhai Ambani Hospital &Medical Research Institute.

Inaugurated in January 2009, The Hospital is a significant CSR initiative from Reliance Anil Dhirubhai Ambani Group. It is designed to raise India's global standing as a healthcare hub,with emphasis on excellence in clinical services, diagnostic facilities and research activities.

It is the only hospital in Mumbai to function with a FULL TIME SPECIALIST SYSTEM that ensures the availability and access to the best medical talent around-the-clock. The 750-bed hospital has over 103 full-time doctors,520 nurses and about 200 paramedical and growing.

It represents a confluence of top-notch talent,cutting edge technology,state of art infrastructure and most important, commitment .KDAH offers doctors and patient's cutting edge diagnostic and surgical solutions as well as the latest in IT systems. In many cases,they represent the first of their kind in the region.

KDAH is fully geared in terms of talent ,technology, structure and spirit-to reshape perceptions regarding hospitals and redefine the concept of caring. Indeed, this globally benchmarked institution marks the beginning of a new era in Indian healthcare.

History

The hospital project was initiated in 1999 by Dr. Nitu Mandke as a large scale heart hospital. Dr. Nitu Mandke was born in 1948 in a middle class family. He was first in the family to choose medicine as a profession with a determination to become a heart surgeon.

He joined B.J. Medical College; Pune from where he passed his M.B.B.S in 1970 came to Mumbai for further studies and completed his super specialty course in Cardiovascular Surgery. He spent close to 8 years working with world renowned figures in cardiac surgery like Dr. MagdiYacoub in England and Dr. Kirklin and Dr. Pacifico at the University of Alabama in the United states. He was an all-rounder with exemplary proficiency in sports , arts, languages , mathematics and so on.

In his lifetime he won the heart of many and repaired many more through unerring surgery. He won various social awards like : " The Rajiv Gandhi Gold Medal of merit " 1992 , " Indira Gandhi sadhbhawna Award " 1999, " Outstanding Man of the 20th Century " 2000 , " Pride of India"2001, " Sarvashri " Gold Medal 2000 and " Maharashtra Gaurav Award to name a few.

With great passion Dr. Mundke built a substantial portion of the hospital building. Sadly his dream was cut short by fate when he succumbed to a massive heart attack in May 2003 ; leaving adream unfulfilled and unfinished.

The Management of Mandke Foundation approached Reliance ADA Group, who graciously took over this project and developed it into one of the most modern and state –of-the-art multispecialty tertiary care hospital; naming the institution as – Kokilaben Dhirubhai Ambani Hospital & Medical Research institute.

In honor of initiator, the hospital's Medical Convention Centre has been aptly dedicated to the memory of Dr. Nitu Mandke.

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.

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 patients 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.

KEY STATISTICS

Encompassing 10 lakh sq.ft.of space spread over 17 floors and two basements. Its intelligent framework allows for hospital staff to optimize utilization of space and resources.

Accommodates over 750 in – patient beds, allows optimal utilization of resources and ensures privacy, dignity, comfort, comfort, convenience and the best healthcare to every patient. However the smooth and seamless movement of people & staff guaranteed.

Critical care unit is the largest number of critical care beds in Mumbai, with 130 ICU beds. Special technical features in ICU including ceiling mounted, dual arm pendants which ensure that the space around the patient is not cluttered. Another unique feature is dedicated air supply that keeps the critical care free of any kind of contamination and infection.

It has a total of over 140 Full time consulting clinics, with the capacity to handle over 6000 outpatient consulting every day.

Movements in the hospital is managed by 30 elevators – the largest elevator bank for any hospital in India capable of transporting 7500 persons per hour, with different elevators for inpatients , outpatients, staff and catering.

Two dedicated elevators ensure quick transfer of patients to operation Rooms and ICUs.

The hospital's laboratory is housed on a single floor spread over an area of over 40,000 sqft offers over 3000 routine and highly advanced diagnostics, genetic and molecular biology test and will serve as a referral Centre for second opinions.

UNIQUE IN MUMBAI

Mumbai's first slice PET CT Scanner that combines computed tomography and positron emission tomography technologies into a single machine.

140 ICU beds, Largest number of critical care beds in Mumbai.

Hospital's laboratory housed on single floors spread over an area of over 40,000 sq ft. It offers over 3,000 routine and highly advanced diagnostics, genetic and molecular biology tests.

Hospital is having Mumbai's Largest OT complex with 22 operating theatre.

Largest dialysis Centre in Mumbai.

Full – time Specialist System: All doctors are attached and available only at Kokilaben Hospital.

Level I Accident and Emergency Center.

UNIQUE IN INDIA

Encompassing 10 lakh sqft of space spread over 17 floors and two basements. Its "intelligent framework" allows for hospital staff to optimize utilization of space and resources.

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HOSPITAL INFRASTRUCTURE

1. Lower basement
    - Biomedical Engineering
    - CSSD
    - MRD
    - 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 & 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 & 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
    - E.N.T clinic
    - Gastroenterology clinic
    - Dialysis centre
    - Blood bank
    - Urology clinic
    - Nephrology clinic
7. Third floor
    - OT complex 1 (8 theatres)
    - Catheterization 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. Seventh floor
    - IVF centre
    - Cosmetology and aesthetic surgery
    - Laboratory medicine and pathology
    - Nursing College
    - Tissue and bone bank
12. Eighth 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 unit
    - ICU (Medical)
    - Refuge area
15. Eleventh floor
    - General ward
    - Nursing College
16. Twelfth to sixteenth floor
    - Inpatient

DEPARTMENT IN THE HOSPITAL

The following departments function in the hospital

Clinical Services	**Clinical support services**	**Clinical Administrative Services**	**Administrative services**
Accident & Emergency	LABORATORY MEDICINE	Ambulance services	Human resources
OPD	Imaging	Nursing department	Materials
Anesthesia	CSSD	Food & beverages	Marketing
Critical Care	Biomedical waste	Security	Finance
OT	Housekeeping	Mortuary	Engineering
IPD	Pharmacy	Laundry	IT

CLINICAL SERVICES

ACCIDENT AND 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 illnesses 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:

✓ Anaesthesia machine
✓ ETCO2 machine
✓ Cautery machine
✓ OT table

- Procedures done in minor OT

✓ Lumbar puncture
✓ Biopsy
✓ Bone marrow aspiration
✓ Suturing

This department has got its own billing and discharge counter.

Staff

HOD

↓

9Junior 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 cart
    - ✓ Dressing trolley

Ambulance:

There are 2 types of ambulance:

a) Non-cardiac ambulance

b) Cardiac Ambulance

Equipment in the ambulance are as follows:

- Ambulance cot
- Portable Ventilator (cardiac ambulance)
- Portable oxygen unit
- Portable suction unit
- First aid kits
- Traction splint
- Auxiliary Stretcher
- Transfer sheet
- Airways (nasal, oropharyngeal)
- Obstetrical Kit
- Sphygmomanometer
- Stethoscope
- Fire Extinguishers
- 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 consultations every day. These clinics are organised 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 specialities including six centres of excellence.

The six centre 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 Anaesthesiology, Critical Care Medicine, accident and emergency, gynaecology and obstetrics, imaging, laboratory medicine and pathology including biochemistry, molecular biology, haematology, histopathology, microbiology, clinical pathology, transfusion medicine and blood bank, genetics, tissue and bone bank, dermatology, endocrinology, gastroenterology, clinical nutrition, internal medicine, nephrology, psychiatry, pulmonary 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 e-mail 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 check-up 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 investigation. 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, cardiology, ENT, ophthalmology, dental etc. the visiting consultants are from 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 (recovery rooms). The facility includes 22OTs, 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 regimenand 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 suits. 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**
  - 5beds/room
  - Air conditioned
  - Bed head panels with medical gasses
  - Nurse call systems with 2 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

The 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, 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 of 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 co-ordinates 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 320 sq feet in the patient care area

Bed Capacity in each ICU

ICU	***BED CAPACITY***
SICU 1	11
SICU 2	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

✓ 1 Chief Intensivist for all ICU

✓ Junior consultants (12 hour shift)

✓ Clinical registrars (8 hours shift)

- Intensive care nursing staff

✓ 1 Director General Manager for ICU

- ✓ Nurse in charge (8 hours shift)
- ✓ Team leader (8 hours shift)
- ✓ Senior nurse officers
- ✓ Junior nurse officers

- Allied staff
- ✓ Physiotherapists
- ✓ Dieticians
- ✓ Biomedical Engineers
- ✓ Health Care Assistants

Shift timings:

For doctors

- ✓ Morning : 8 am - 4 pm
- ✓ Afternoon : 2 pm - 10 pm
- ✓ Evening : 10 pm - 8 am
- ✓ Overlapping hours : 2 pm - 4 pm

For nurses, HCA and housekeeping staff

- ✓ Morning : 7 am - 3 pm
- ✓ Evening : 3 pm - 11 pm
- ✓ Afternoon : 11 pm - 7 am

Visiting hours: 11 am – 1 pm

5 pm – 7 pm

- ✓ Only 1 relative at a time is allowed

Records and Registers

- Admission and discharge register
- Handing and Taking over/Team leader sheet

- Assignment book
- Leave book
- O.T booking register
- Critical care flow sheet
- Narcotic drug register.

Equipment's:

MONITORING EQUIPMENT	**CARDIOVASCULAR THERAPHY**	**RESPIRATORY THERAPY**	**LABORATORY EQUIPMENT**
Bed side and Central Monitors ECG Recorder Pulse Oximeter Spirometer ECG Monitor Temperature Monitors Blood Glucose Meter	CPR Trolley Defibrillators Infusion Pumps and Syringes	Ventilators Intubation/ Tracheostomy Trolley Nebulisers	Blood gas Analyser Electrolyte Analyser

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 pediatric 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 the 8th floor. The department is divided into 2 zones – outpatients and inpatients. There are 2 isolation rooms. The nurse ratio is 1:1

DEPARTMENT OF RADIATION ONCOLOGY

The department of radiation oncology at KDH is a state of the art unit having the latest technology and equipped personnel, delivering services of international quality. The department has the first installed TRIOLOGY and NOVALIS Tx in the country. It is capable of performing all the high end treatment like IMRT, IGRT intracranial stereotactic radio surgery and radiotherapy, extra cranial sterotaxy, total body radiation, total skin electron treatment. There is a facility of brachytherapy for all sites in the form of remote afterloadingHDR brachytherapy system with 3D planning facility. The department works in close coordination with surgical oncology and neurosurgical subspecialties' (e.g. head and

neck, thoracic, breast, urology and gynae oncology, neuro-oncology) maintaining a high quality evidence based practice for the particular sub suite.

CENTRE FOR REHABILITATION

- The centre is located on a dedicated floor with 30,000 square feet area and exclusive inpatient service, first of its kind.
- The department is located on 7th and 8th floor of hospital.\
- It has got its own billing desk.
- It also consists of a day-care centre for those patients who need 4-5 sessions in a day.
- **Staff of the department consist of**

HOD

↓

40 physiotherapists

↓

1 Asst. nurse

↓

3 Nurses

↓

5 HCA

- **Following therapy services are available :**

1. Neurological Rehabilitation
2. Musculoskeletal rehabilitation
3. Cardiac Rehabilitation services
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

IVF CENTRE

- Centre for reproductive endocrinology and fertility (CREF) is located on the 7th floor of the hospital and has dedicated space for out-patient care and day care of patients with infertility and reproductive endocrine problems, and for medical acupuncture and mind body program.
- CREF is staffed by a full time consultant reproductive endocrinologist and infertility specialist, embryologist and infertility issues and a health care assistant.
- A full-fledged laboratory and radiology department offering a comprehensive range of tests including some newer cutting edge tests under one roof only compliments our services at CREF, but is also extremely convenient for patients.
- Medical conditions addressed at CREF:
  - ✓ **Reproductive endocrinology**
  - ✓ **Midlife health care**
  - ✓ **Bone health**
  - ✓ **Adolescent gynaecology**
  - ✓ **Infertility treatment**
    - ❖ Fertility drugs to induce / enhance ovulation (pills or injections)

- ❖ Intrauterine insemination
- ❖ Assisted reproductive therapy (ART) procedures:
  - o In vitro fertilization (IVF)
  - o Intracytoplasmic sperm injection (ICSI)
  - o Assisted hatching(AH)
  - o Blastocyst transfer
  - o Pre-implantation genetic diagnosis (PGD)
  - o Embryo cryopreservation
  - o Sperm cryopreservation
  - o Testicular tissue cryopreservation
  - o Third party reproduction
    - Donor oocytes
    - Donor sperm
    - Gestational surrogacy
    - Donated embryos

- Other facility:
  - ✓ Diagnostic tests
  - ✓ Billing and registration
  - ✓ Phlebotomy services
  - ✓ Ultrasound facilities
  - ✓ Andrology and embryology laboratories
  - ✓ Operating room, pre-op and recovery room facilities
  - ✓ Counselling and support services

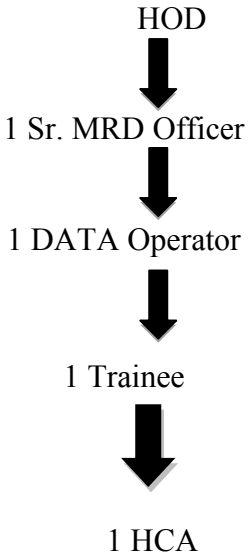
CLINICAL SUPPORT SERVICES

MEDICAL RECORD DEPARTMENT

- The main functions of the department are :

1) Storing file for future reference.
2) Research.

- Staff:



- Open and close audit is done of all files before keeping them 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 files
    d) OT recovery files
    e) Chemotherapy files
    f) Dialysis files
- Apart from files few forms and records are also store in this department:
  - ✓ Consent form
  - ✓ 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:
  - ✓ Reports -1.5years
  - ✓ Death, DAMA & MLC files 20 years
  - ✓ Regular files-5years
- ICD-10 coding is done for storing files:
  - ✓ Red-Death, DAMA & MLC
  - ✓ Black-Oncology
  - ✓ Yellow-Gynecology& obstetrics, IVF files
  - ✓ Dark blue-General medicine, critical care, Nephrology, Endocrinology, Gastroenterology, Pulmonary medicine, Dermatology, Dental, Psychiatry, rehabilitation, Rheumatology.
  - ✓ Light blue- Pediatrics
  - ✓ Orange- Neurology, CVTS, Cardiology, orthopedics
  - ✓ Green-ENT, general surgery, ophthalmology, Urology, Cosmetology, Interventional radiology.
- This department has to notify Bombay Municipal Corporation(BMC) about following things on regular basis:
  - ✓ Birth and death report (once in a week).
  - ✓ Notifiable disease which includes cholera, dengue, plague, yellow fever, TB, polio, meningococcal meningitis, leptospirosis, viral encephalitis (once in a week).
  - ✓ Maternal mortality (once in a month)
  - ✓ 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.
- Exhaustive menu of tests from routine to esoteric.
- 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-disciplinaryarea concerned with the appropriate use of blood and blood components 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 also 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 for one's own use) is also accepted. The blood donors are informed and educated about the infections transmitted by transfusion of blood components 100% of collected blood is processed into component like red cells concentrate, platelet concentrate, fresh frozen plasma (FFP) and cryoprecipitate. The use of the components is better and cost effective. The blood bank at KDAH is equipped with state of art equipment, which enables use of advanced techniques for processing/screening of blood and its components. All the mandatory screening for the transfusion transmissible disease like HIV, HBV, and HCV is done with the more sensitive and specific CMLIA and ELISA methods. All units are screened for VDRL and malaria parasite. Red cells in an additive solution (RCA) like, SAGM or ADSOL is a product which is used in variety of indication like surgeries, anemia, trauma, child birth etc. as a thumb rule one unit would increase the hemoglobin by 1 gm.%.

IMAGING

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

- CT Scan
- MRI
- X-Ray
- Ultrasonography
- 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, and 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). This also facilitates the training and education of skilled technicians who must be aware about the standards, complexities, challenges, risks and technicians associated with the CSSD function. Every CSSD task must be performed for the welfare and safety of patients, co-workers and the community.

CSSD is the heart of hospital infection control and the most important unit of clinical support services. CSSD's main functions are cleaning and drying, assembly, packing, sterilizing, storing and distributing instruments (both multi use and single use devices), as per well delineated protocols and standardized procedures.

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 officers

6 junior technical officers

10 trainees

16 health care attendants

MAJOR TECHNOLOGIES

Ultrasonic cleaner

Washer disinfectant

Dryer

Steam sterilizers

Plasma sterilizer

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 MANAGEMENT:

- INDENTATION
- RECEIVING
- STORING
- DISTRIBUTION

The staff consists of:

- 5 manager

- 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

Functions 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 spraying every 24 hours for mosquitoes, cockroaches, flies, rats, lizards and termites.
- Garbage disposal- The housekeeping staff collects garbage collected in specified color coded bags from all garbage bins existing inside the hospital premises and 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 maintenance of in house plants & 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 ADMINISTRATIVE SERVICES

STORES

Material stores functions in order 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 on the basis of 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 consumables 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. FEFO (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 in 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 linen and laundry is the availability of clean uniforms for patients and staff. Soiled linen when collected is kept in the dirt utility room in a hamper trolley. Infected linen are 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 tothe 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 and care of patients. It is also responsible for proper usage and quality performance of these costly equipment and tools inside the hospital

The department 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 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:

- Inpatient 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 counselling 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 patients' rooms 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 for the patient's speedy recovery. The staff includes:

- Regional head of support function
- F&B manager cum chef
- Assistant manager F&B
- Executives
- Senior Dietician
- Other 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.

EDUCATION AND TRAINING FACILITIES FOR NURSES

In line with the vision of continued commitment toward education and training in the field of healthcare, particularly the preparation of highly competent nursing professionals dedicated to patient care, the board of management has upgraded its School of Nursing to a full KDA College of Nursing.

ADMINISTRATIVE SERVICES

ADMISSION AND BILLING:

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 manager, and patient care executive and patient care coordination. 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, in patients and executive health checkup patients for various investigations (registration counter).
- Admission, billing and discharge of in patients.
- Direct the patients 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:

T.P.A. staff includes one executive clinical administrator and 4 Customer care officer.

Functions:

- Counselling.
- 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 DAPARTMENT:

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 check-up camps and awareness talks for corporate or PSU's and RWA, designing all the brochures and signage, conducting CME's/seminars. The sales department deals with PSU's and corporate tie-ups, 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 n 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
- Asst. Manager
- Senior executives
- Junior executives

- 2 cashiers

PURCHASING DEPARTMENT

Purchasing department is responsible for the procurement of function of the hospital the primary functions of the purchasing department are to:

- Procure the rights and services from the right suppliers at the right time for the right place.
- Receive, warehouse, issue $ distribute stocks to hospital departments in accordance with KDH procedure.
- Hospital users and clinicians actively participate in product evaluation processes. The purchasing department is actively involved in cost analysis and supplier performance management. It is through all of these activities that the department manages the chain process.

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
- Counselling
- 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

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

Staff:

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

INTRODUCTION TO INTENSIVE CARE UNIT

ICU is highly specified and sophisticated area of a hospital which is specifically designed, staffed, located, furnished and equipped, dedicated to management of critically sick patient, injuries or complications. It is a department with dedicated medical, nursing and allied staff. It operates with defined policies; protocols and procedures should have its own quality control, education, training and research programmes. It is emerging as a separate specialty and can no longer be regarded purely as part of an anaesthesia, Medicine, surgery or any other speciality.[1]

An intensive care unit (ICU), also known as a critical care unit (CCU), intensive therapy unit or intensive treatment unit (ITU).

HISTORY OF ICU

In 1854, during the Crimean war, Florence Nightingale created a dedicated care area for soldiers wounded in the battle. She recommended establishing separate post surgical areas in hospitals. It was reported that Nightingale reduced mortality from 40% to 2% on the battlefield. Although this was not the case, her experiences during the war formed the foundation for her later discovery of the importance of sanitary conditions in hospitals, a critical component of intensive care. In 1950, concept of "Advanced Support of Life," was introduced by the anesthesiologist Peter Safar, keeping the patients ventilated and sedated in an intensive care environment. Safar is the first practitioner of intensive care medicine as a speciality. In December1953, in response to polio epidemic, Danish anesthetist Bjorn Ibsen established the first intensive care unit in the world at Kommune Hospitalet in Copenhagen.

In 1958, John Hopkins Bayview becomes the first multidisplinary ICU. In 1960, first known neonatal ICU was established at Yale University.[2]

The main pioneer of the field of critical care in India was *Farokh E Udwadia*, a brilliant physician with international training in pulmonology. In the mid 1970s, Udwadia developed the first respiratory care units in the country in two hospitals in Mumbai — a community hospital and a private one. The most major achievement of these units was not only to bring

down the mortality of tetanus, but also to open the eyes of society to the need for critical care services.[3]

Indian Society Critical Care Medicine (ISCCM)

Indian Society of Critical Care Medicine was established on 9th October, 1993, in Mumbai, India. It is the largest non-profit association of Indian Physicians, Nurses, Physiotherapists and other allied health care professionals. ISCCM was started with a small group of consultants, from Mumbai, is now having membership of 5019, comprising of 44 city branches all across the India with headquarter at Mumbai. ISCCM is committed for the promotion and advancement of intensive care as a specialty.[4]

The ISCCM aims to achieve its objectives through the following activities:

- Impart educational training by developing and running Post-graduate fellowship courses and diplomas in the field of critical care medicine.
- To publish scientific journals and literature to further the cause of the discipline.
- Setting up research projects in the field of critical care across the country.
- Formulating standards and guidelines for the organization and practice of intensive care to suit Indian conditions.
- Organizing national and international congresses and meetings.
- Providing basic training in intensive care for non-specialists.
- To seek affiliations and collaborations with national and international organizations of similar interests to achieve the objectives of the society.

INTENSIVE CARE UNIT AT KOKILABEN DHIRUBEN AMABNI HOSPITAL

KDAH has the largest number of critical beds in Mumbai. It has level III ICU which has all recent methods of monitoring and invasive and non-invasive including continuous cardiac output, headed by an intensivist. It has multisystem care and referral available 24 hours. It has multiple ICUs as follows:

- Postoperative/ Surgical Intensive Care Unit (SICU)
- Medical Intensive Care Unit (MICU)
- Paediatric Cardiac Intensive Care Unit (PCICU)
- Paediatric Intensive Care Unit (PICU)
- Neonatal Intensive Care Unit (NICU)
- Transplant ICU

All ICUs have closed model of ICU. A closed system implies that patient care is either directed or co-managed by an intensivist. The patients are in effect placed

under the charge of an intensivist who delivers round-the-clock cover through suitably trained physician staff. He provides leadership in the management of individual patients, organizes 'on call' cover, puts in place infection control and quality care practices, staff training and clinical research.

Surgical Intensive Care Unit

The Surgical Intensive Care Unit (SICU) is the multispecialty medical care center for critically ill patients who require surgery or are recovering from surgery.

SICU are named as ICU 1 & ICU 2 in KDAH

Location

- It is located on 3rd floor.
- As per ICU Planning and designing guidelines 2010, the ICU should be easily accessible to A & E, recovery room, surgical and medical wards, diagnostic facilities.
- There is a separate Brown elevator bank connecting A& E directly to SICU on 3rd floor.
- OT complex is located on the same floor in which cardiac and neurological surgeries are carried out.
- PICU is also on the same floor.
- SICU is in close proximity to the Catherization lab and Interventional Radiology on the same floor

ICU 1 has 11 beds in which post surgical cardiac and neurological cases are admitted
ICU 2 has 10 beds in which medical cases with cardiac complications are admitted

Staffing:

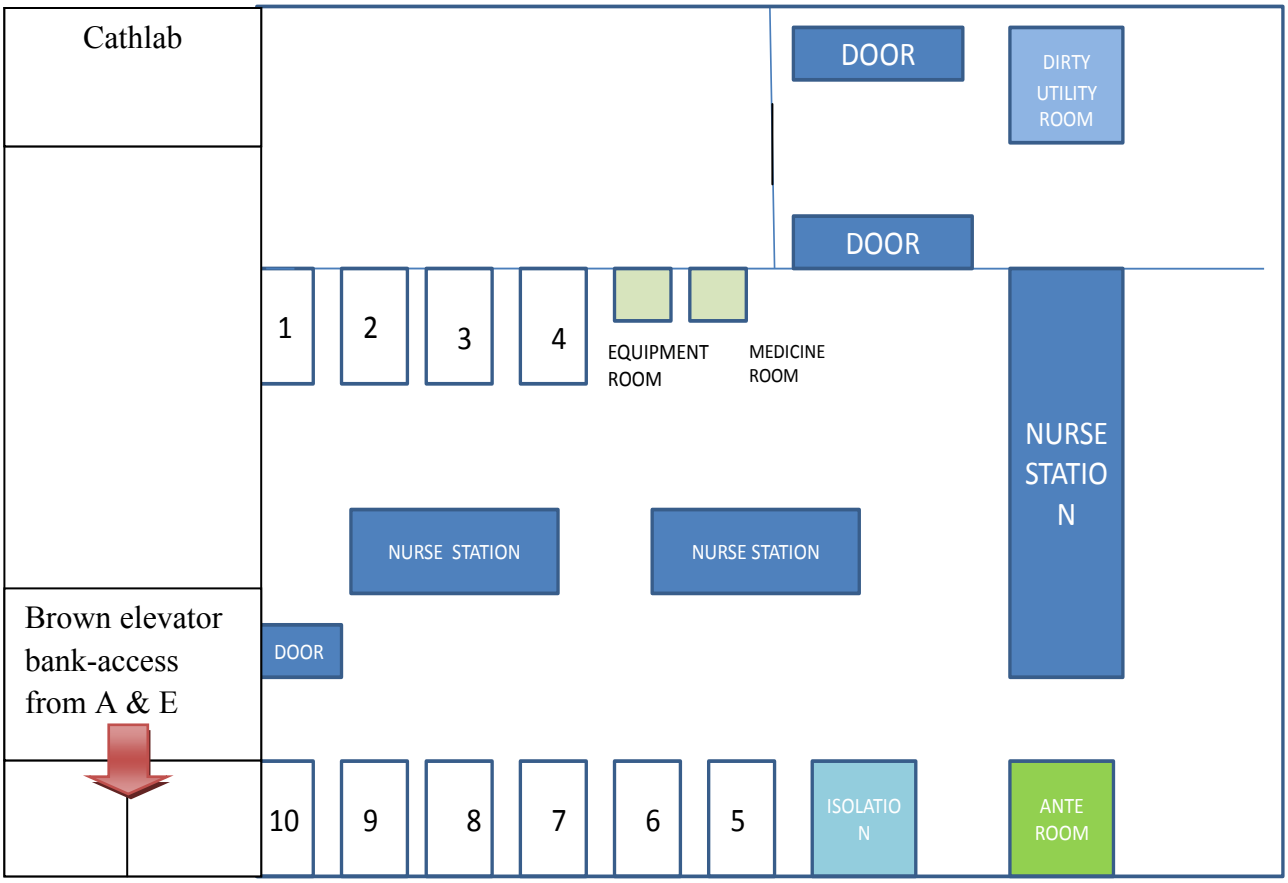
Intensive Care doctors

1 Intensivist
2 Junior Consultants for ICU 1 & ICU 2 on 12 hours duty (8-8)
2 Registrars /per shift of 8 hours :

Intensive care nurses

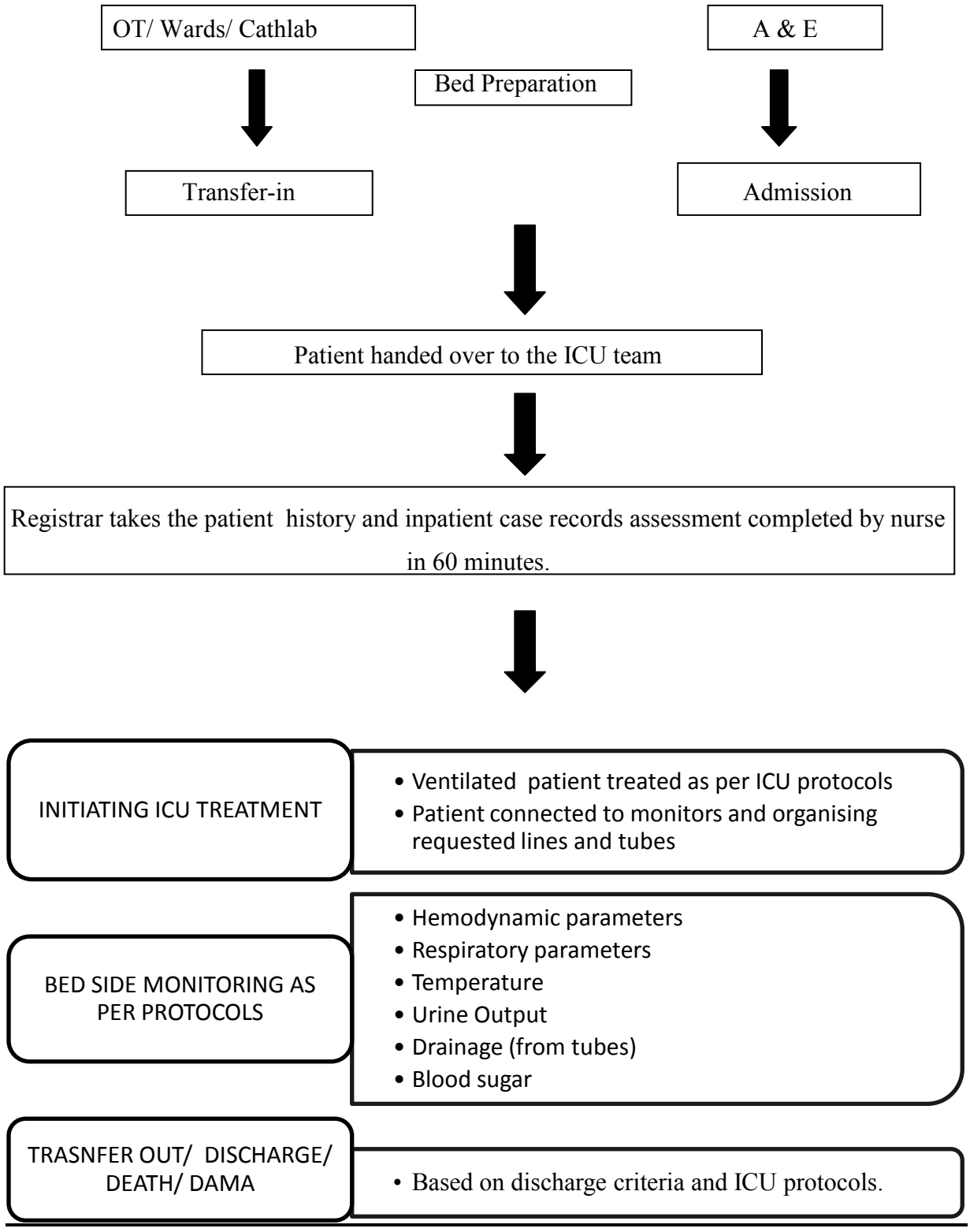
1 Nurse incahrge/shift /SICU
1 Team Leader /shift/ SICU
9 Nurse officers/ shift/SICU

Layout Of SICU



PROCESS FLOW

Patient comes from



IMPOTANT PROTOCOLS AND POLICIES

Narcotic Drug Policy

Narcotics or opioids are any substances that either stimulate or dull an individual's senses and that ordinarily become habit-forming (i.e., addictive) when used over time. Morphine and codeine are the two natural products of opium. When people use narcotics only to control pain, they are unlikely to become addicted to the drugs. However, opioids provide an intoxicating high when injected or taken orally in high doses. Opioids are also powerful anxiety relievers. For these reasons, narcotic abuse is one of the most common forms of drug abuse. It should be carefully used under doctor's direct care.

Signs and symptoms of opioid abuse include analgesia (feeling no pain), sedation, euphoria (feeling high), respiratory depression (shallow or slow breathing), small pupil, nausea, vomiting, itching or flushed skin, constipation, slurred speech, confusion or poor judgment

Regulation

- The hospital must comply with the Narcotic and Controlled Drug (NCD) regulations of the Narcotics and Psychotropic substances Act(NPDS) Act, 1985.
- NCDs may only be dispensed or administered to a patient of the hospital upon a physician's written order in the health record.
- Physicians and staff may not obtain a NCD from the hospital for themselves or their office.

Storage and documentation

- The narcotic drugs commonly used are fentanyl -2ml ampule and 10 ml and morphine. They are stored in double lock cupboard which has two keys –Nurse incharge and the team leader has the authority to these keys. Whenever the doctor prescribes a narcotic drug, 2 copies of prescription note signed by the doctor-one is kept in the patient file and the other is send to the pharmacy. The entry of the drug is done in the charge sheet and narcotic drug register. The Prescription note, charge sheet and empty ampule is sent to pharmacy. On approval by the pharmacy, the filled ampule is sent to the required unit of hospital.

- In case of breakage of ampule, an incident report stating the reason for breakage is written and is handed over to the pharmacy and the broken ampule is disposed into the puncture proof container for sharps.
- All wastage of NCDs is witnessed by team leader and the drug is disposed into the wash basin.

Crash Cart protocol

Crash cart trolley is contains all drugs and medical eouipments which is used in case of emergency situations-cardiac or respiratory arrest.

The crash cart is sealed and is opened only when it is utilised in cases of emergency situations. The cart has to be closed and all the drugs and equipments should be replaced immediately after its utilisation.

On every 2nd Sunday of a month, Nurse incharge checks the proper functioning, expiry date and counting of drugs and equipments kept in the crash cart trolley. Defibrillator is checked by the team leader on each day in all shifts.

Code Blue

Code Blue is a situation of Cardiac or Respiratory Arrest. If a patient in Wards/OPD/OT undergoes cardiac or respiratory arrest, the primary person who observes the patient in such condition rings a code blue bell located near patient bedside, the bell immediately is transmitted to central nursing station. The Nurse dials a extension number 22222 to inform the security, who immediately announces the location where the code blue has occurred. The code blue team is located in SICU-2 in KDAH. The team immediately rushes to the desired location.

Study Topic

Optimising Utilisation of Intensive Care Unit Bed in a 750 bedded Multispeciality Hospital in Mumbai

1.Background .

ICU beds are a very expensive and limited resource with expenditure of large amounts of money and time because they provide:

- specialized monitoring equipment
- a high degree of medical expertise
- constant access to highly trained nurses (usually one nurse for each bed)

Despite ICU occupies relatively small proportion of hospital beds, it accounts for 8% to 3% of hospital expenditures. Intensive care unit costs are highest during the first 2 days of admission, stabilizing at a lower level thereafter. Direct ICU costs per day are six times higher than those for non-ICU care. Higher expenditure in ICU is of global concern.

Since ICU beds are limited in a hospital, rationalised use of ICU bed for needy patients therefore is necessary.

Audit on adherence to admission criteria help us to accurately identify patients fit for ICU admission, which will help to patient as well as hospital in terms of bed utilization and financial aspect..

Delaying discharge in ICU patients can be a waste of resources and deny the chance to other patients of an ICU bed who may be in dire need of critical care. Therefore, identifying reasons for delay in discharge and streamlining the length of stay helps us in cost effective management in ICU.

Readmitted patients have twice the length of stay than non readmitted patients. Reintubation increases mechanical ventilation days and increases risk to VAP which results in higher LOS. Therefore Readmission and Reintubation rate should be assessed to reduce outcomes associated with it.

2. Research question

2.1 What is the level of adherence to the standard admission criteria in ICU?

2.2 What are the reasons for delay in transfer out of patients who are fit for discharge from ICU?

2.3 What is the Readmission and Reintubation rate in SICU and MICU?

2.4 Are readmission and reintubation cases under-reported?

2.5 What are the outcomes associated with Readmission and Reintubation?

3.Specific objectives

3.1 To evaluate adherence level of admission in ICU as per defined KDAH standard

3.2 To study process flow and identify reasons for delay in transfer out from ICU.

3.3 To identify the number of readmissions and reintubations in SICU and MICU

3.4 To assess its accurate recording of readmission and reintubation cases.

3.5 To study the outcomes associated with Reintubation and Readmission in ICU.

4.Operational Definition

4.1 ICU readmission is defined as admission of a patient to the ICU within 48 hours of shift out from the previous ICU during the same hospitalisation period.

4.2 Reintubation is defined as the intubation within 48 hours of extubation of a patient who had been initially tracheal intubated.

4. Research methodology

Area of study : SICU & MICU

Study Period : 1st April to 30th April

Study type : Descriptive study.

Sampling

Study objective	Sampling technique
Adherence to admission criteria	Systematic random technique (110 patients)
Readmission rate	100 % sample for April Month in SICU and MICU
Readmission rate	100% sample for April month in SICU and MICU

Data collection

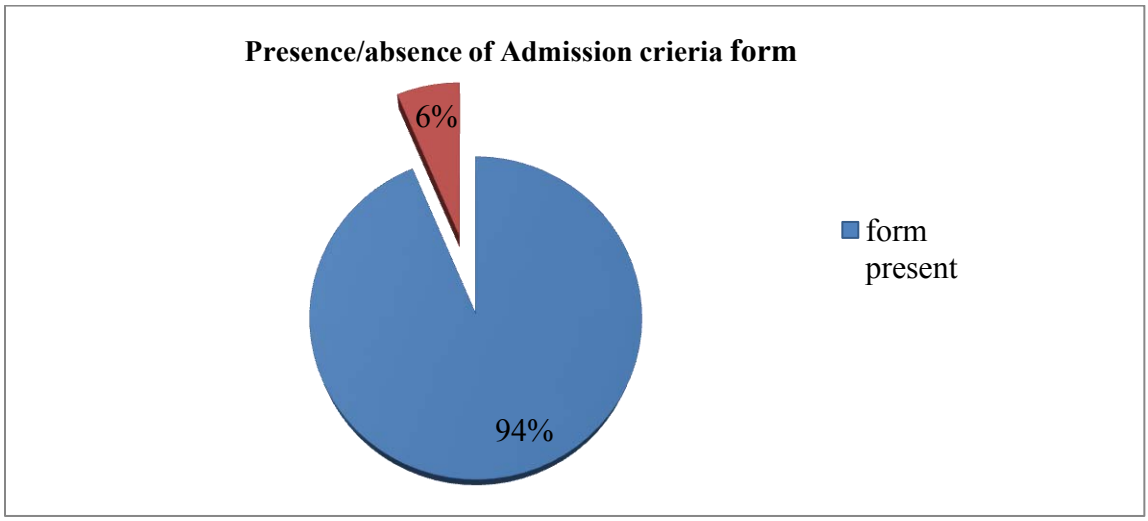
The study carried out consisted of examining the patient's files for consultant's notes, admission history form, progress notes and transfer summary to assess the criteria for admission and discharge in ICU and compared with the standard NABH admission criteria checklist.

The admission criteria form was examined to assess proper documentation. Observational study and interview with doctors and bed side nurses was carried out to identify the reasons of delay in transfer out from ICU.

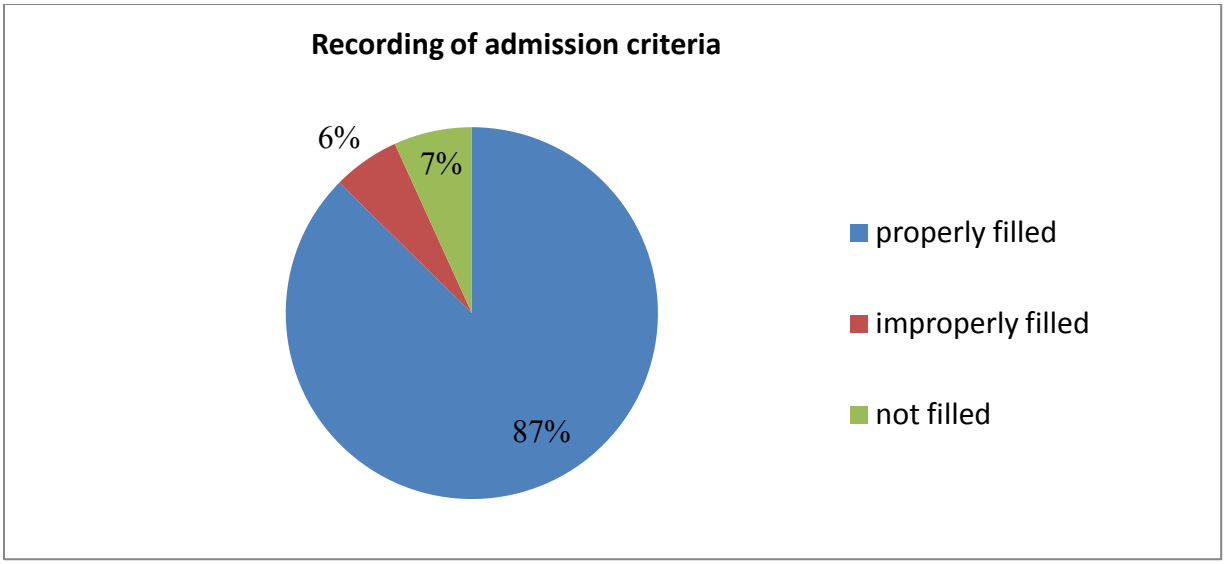
Observational study and review of patient record files was carried out to assess readmission and reintubation cases. To assess accurate recording of such cases, Quality Indicator Register was examined.

4.Data Analysis and Data Interpretation

3.1 Adherence to KDAH standard admission criteria in ICU and its Recording



Out of 110 patient files, in 94% of patient files admission criteria form was present. 6% of patient files did not have the admission criteria form. Therefore, recording of the criteria for admission in the ICU was absent in these patient files. It is the duty of nursing staff to file the form in patient files and make sure it is available in the forms/documents rack. Due to absence of form in the documents rack, nurses did not file the form.



- 87 % patients which had properly filled forms fulfilled at least one of the admission criteria.
- 6% improperly filled forms had xerox copy of the already filled admission criteria form. The reason for this is non-availability of admission criteria form in the MICU, took a Xerox copy of the existing filled admission criteria form present in one of patient files.
- Also on examining the patient files of 7% not filled forms and comparing it with the standard criteria for admission, it was found that all the patients fulfilled at least one admission criteria.

3.2 Process flow and reasons for delay in shift out from ICU

- There were 3 out of 110 patients who met discharge criteria, but discharge was delayed by 24 hours or more than that
- On observational study and interview with doctors , it was found that following were the reasons for delay in discharge :

One of the predominant reasons for delay in shift out was non- availability of beds in wards/stroke unit. Stroke unit has only10 beds. There is average delay of 4 hour 7 minutes in discharge from wards for cash patients and for TPA patients is as a result beds are not available in inpatient wards and this results in delay in shift out from ICU. There is delay of 3.5 hours to maximum of 8 hours in shift out from ICU. Due to non-availability of ICU beds, post surgical patients requiring immediate invasive monitoring cannot be shifted from OT and leads to delay in OT surgeries and delay in shift out from A & E.

- Other reasons for delay in shift out from ICU.
  a. Patient request
  b. Patient relatives not agreeing for shift out in case of coma patients.
  c. Shift out plan

Shift out plan

- The decision to shift out a patient from ICU is taken by Primary Consultant and referred specialists of a particular patient.
- Primary Consultant decides to shift out once the patient is reviewed by the patients referred specialists.
- Delay in rounds and different timings of doctors to visit the patient delay the final call to shift out.
- For optimum utilisation of ICU beds, we need to streamline the transfer out decision making from ICU.

3.3 Readmission and Reintubation Rate in SICU and MICU

Readmission Rate

There was no readmission within 48 hours of shift out to wards in SICU in month of April. The readmission in SICU was 0%.

In MICU, 7 patients were readmitted, 2(28.57%) patients were readmitted twice within 48 hours of shift out. Therefore, a total of 9 readmissions were identified. Out of these 9 readmissions, 4 cases (44.44%) were readmitted within 24 hours.

According to ISCCM, benchmark of readmission rate within 24 hours is 4-6%

Formula

(Number of readmitted patients within 24 hour of shift out/no. of patients managed in MICU)*100

= (4/286)*100

= 1.4% cases in MICU

[For calculation of denominator census of April month in MICU was taken from register]

According to ISCCM benchmark, KDAH process quality practices are good and readmission rate are less within 24 hours.

According to NABH: NABH does not any benchmark for readmission

Formula

(No. of return to MICU within 48 hours of shift out/no. of transfers , discharges and deaths in MICU)*100

= (9/286)*100 = 3.14%

The most common reasons for ICU readmission were pulmonary problems, including hypoxia and desaturation, cardiac conditions (cardiac arrest) followed by upper-GI bleeding and neurologic impairments were also common causes of ICU readmission**.**

Reintubation within 48 hours of extubation

No. of cases of reintubation in SICU : 2

No. of cases of reintubation in MICU : 1

No. of endotracheal intubations in SICU : 26

MICU : 30

Reintubation rate in SICU = (2/13)*100

= 7.69 %

Reintubation rate in MICU = (1/30)*100

= 3.33%

According to ISCCM, benchmark for Reintubation Rate is 12%

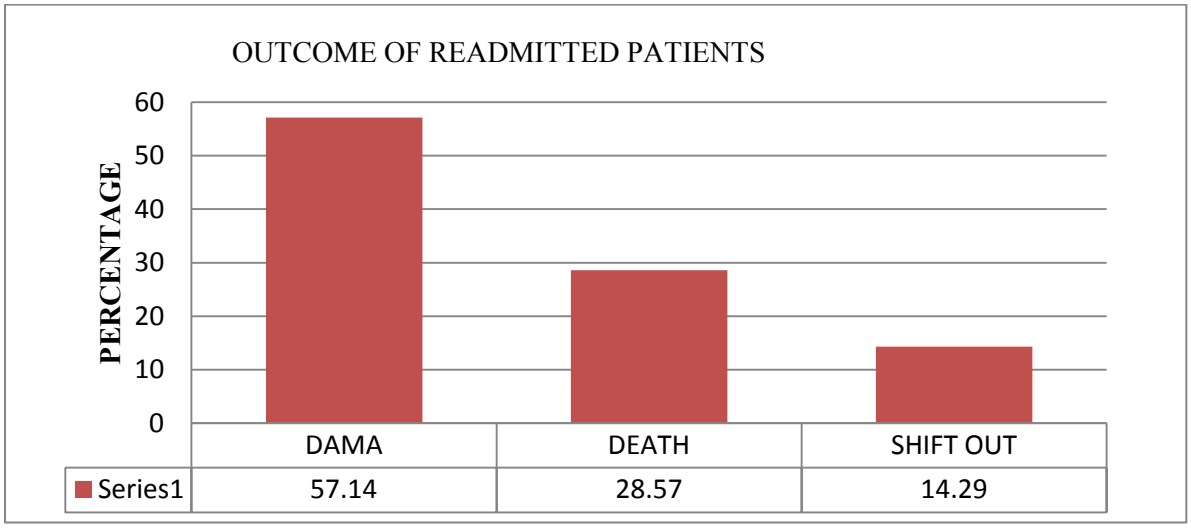
3.4. Accurate Recording

- There was under reporting of 3 cases of readmission and 1 case of reintubation.
- There is not timely recording of cases in the quality indicator register. Doctors record only those cases which they recollect which leads to under reporting
- Some cases are under reported because the patients are re-admitted in another ICU and not in the same ICU where they were previously admitted.
- Also in case of non-availability of ICU beds they are admitted in Accident and Emergency department within 48 hours of shift out which leads to miss out f cases of readmission within 48 hours

3.5 Outcomes associated with readmission.

Readmitted patients have twice the length of stay than non- readmitted patients. Prolonged length of stay incurs lot of financial costs to both the hospital and patients, and leads to increased morbidity and emotional dissatisfaction of the patient. Patient prefers discharge against medical advice due to financial reasons and increased psychological morbidity. DAMA patients are at risk of 1.5-10 times higher mortality.

The ALOS of readmitted patients in ICU is 8.05 days as against 4.6 days of non readmitted patients in MICU.



As observed in the above graph maximum of readmitted patients are discharged against medical advice due to financial reasons and increased emotional morbidity in ICU environment.

DAMA of readmitted patients constitute 25% of total DAMA patients in MICU

Death of readmitted patients constitute 10.5% of total deaths in MICU.

6. Recommendations

Although KDAH has the best quality practices as compared to the standard guidelines, it should focus on enhancing the efficiency and productivity in ICU.

6.1 Multidisciplinary team rounds in ICU at one fixed time in morning and afternoon during the shift out plan.

6.2 A list of referred specialists whose review is required for shift out of patients from ICU should be made and the list can mailed on common folder of hospital in the morning time.

6.3 Increase the number of beds in wards and Stroke unit.

6.4 Assessment of quality indicators addressing the availability and utilisation of resources.

- 1. Total no. of elective surgeries cancelled due to lack of ICU bed.
- 2. Total number of adult patients who were transferred to another facility due to unavailability of an ICU bed, during a particular time period.
- Total number of adult patients whose discharge from the ICU was delayed more than 6 hours.

6.5 Establishment of HDU/Step down ICU

It is a Cost effective alternative to critical care admissions for patients who do not require invasive monitoring but require frequent monitoring of vital signs and/or nursing interventions.

Patient satisfaction may be increased since an intermediate care environment is less noisy and may have more liberal family visitation policies. Benefits of HDU are as follows:

- It increases ready availability of critical care services to those patients most urgently in need,
- Helps in streamlining the ICU admission process,
- And it attenuates unnecessary ICU stays or delays in transfer.

6.6 For accurate recording of readmission cases and reintubation cases

- *Colour coded card* for readmission and reintubation can be kept in patient files mentioning the date and timings of shift out from previous ICU and readmission to present ICU.
- *Tracking from HIS* : A back end report from the IT team to capture accurate data on ICU readmission irrespective of old/new ICU
    - This has to be monitored by ICU doctor. The time and date of readmitted patient movement should be included in the HIS.
- *Weekly audit* by the management on accurate recording should be carried out to ensure timely recording of cases in Quality Indicator Register
- There can be *central reporting* to the nurse supervisor.
- When the patient is readmitted to ICU, new admission form along with time mentioned should be filled for easy tracking.

6.7 Audit on DAMA patients should be carried out since they are at higher risk of mortality.

Study Topic

To study Utilisation and Turnaround Time of Operation Theatre in a 750 Bedded Multispeciality Hospital in Mumbai

1. Background

Operation theatres are critical assets to all tertiary care hospitals because they contribute to almost two-thirds of hospital's total revenue. Moreover, OTs also account for about 40% of the hospital's total expenses which include manpower costs (i.e. salaries of surgeons, anaesthetists, nurses, etc),capital cost, the fixed and variable operating costs of the surgical facility. It is therefore desirable to optimise the efficiency of these assets. The Private hospital business model generates earnings only when the OT is in use. Utilisation is therefore a simple and adequate measure of efficiency of Operation Theatre because its ability to generate revenue (its efficiency) rises as the time for which it is used increases.

Improving efficiency of OT major undertaking due to the inherent complexity of the processes involved. This complexity can be attributed to several factors. First, determination of a schedule of patient arrival times that balance patient waiting with resource utilisation (e.g. OR, surgeons, nurses, etc.) is a complex problem which includes decisions such as sequencing of patient arrivals, allocation of patients to ORs, and matching of patients with surgical teams. Second, ORs are usually part of a surgical suite where they share common resources required in both reception of arriving patients and post-surgery recovery of patients. In the disposal of post-operative patients, Intensive Care Beds are a vital resource which is unfortunately prone to much utilisation uncertainty due to their multiple users, and this uncertainty is exacerbated in hospitals with Emergency Departments. Therefore managing the patient traffic through a surgical suite requires a holistic approach with account of both upstream and downstream resource requirements. Third, there is significant uncertainty in several activities involved in the delivery of surgical care, such as the uncertainty related to arrival times of patients, OR personnel availability, duration of the surgical procedure, etc. Inevitably, this makes advanced planning of OR utilisation very difficult.

This study investigated the efficiency of an operating theatre complex consisting of 7 ORs in a 750 bedded Multispecialty hospital in Mumbai by measuring utilisation levels and to identify areas, if any, where improvements are feasible.

2. Objectives

2.1 To calculate the turnaround time of Operation Theatres in General OT Unit.
2.2 To calculate the utilisation of Operation Theatres in General OT Unit.
2.3 To identify bottlenecks, if any, in proper and efficient utilisation of Operation Theatre time.

3.Research Methodology

3.1 Study type: A descriptive study was carried out within a stipulated time period of 10 days and TAT and percentage utilisation of each of seven O.Ts was calculated.

4.1 Area and Period of Study: The study was carried out in General Operation Theatre Complex located on the fifth floor of the Hospital in a time period of 10 days. It consists of seven Operating Theatres with the following surgeries carried out in each OT.

Operation theatre	Type of surgery
1	Ophthalmology
2	Urology
3	Orthopaedic surgery
4	Robotic surgery
5	General surgeries
6	General surgeries
7	General surgeries

3.2 Sampling: 100% sample was taken from 17th May to 26th May 2014

3.3 Data collection:

- Primary data source: By direct observation of the processes and discussion with the staff and team members.
- Secondary data source: Review of O.T registers.

4. Data Analysis and Interpretation

2.1 Turnaround Time

The turnaround time is calculated from the time the patient leaves the operating theatre through to the time the next patient arrives in the operating theatre.

OT	TAT (in minutes)
1	25.4
2	23.12
3	19.57
4	28.9
5	12
6	15
7	14.06

2.2 Utilisation of O.T

The operation rooms were functional from 8:00 am to 8:00 pm(720 minutes).The total average time taken for each surgical procedure in each O.T was calculated. The average number of surgeries that is currently performed in each OT per day was compared with the number of surgeries that can be actually performed per day in each of 7 OTs.

OT	**No. of surgeries currently performed**	**No. of surgeries that can be actually performed**
1	4	10
2	4	8-9
3	3-4	6
4	3-4	5
5	2-3	3
6	3	4
7	3	3-4

2.3Reasons for delay in surgeries

- First case delay: It was observed that the surgeon arrives late for first scheduled case which leads to delay in subsequent scheduled surgeries.
- The patient doesn't come for the scheduled surgery leading to cancellation of surgeries on the scheduled day.
- Due to financial clearance issues, the patient does not arrive on time for surgery.
- Patients requiring immediate intensive monitoring after surgery need to be shifted to ICU. Due to non availability of ICU bed, there is delay in shift out from operation theatre leading to delay in subsequent surgeries.
- Non-availability of porter to shift out from wards/ICU to OT leading delay in patient in time.
- Equipments such as portable X ray, C arm which were required for certain surgeries were not available on time.
- Delay in performing investigations of patients preoperatively.
- Patients not following the preoperative instructions.
- Certain surgeries were delayed /cancelled/postponed because patient was not medically fit for surgery at the scheduled time and day.
- Failure of sterilization cycle

4. Conclusion

4.1 OT 1, 2, 3, 4 have increased Turnaround Time. On comparing the surgeries that are currently performed to the number of surgeries that can be actually performed, it was concluded that these OTs are underutilised.

4.2 OT 5 and OT 7 are efficiently utilised as they are performing the actual number of surgeries per day as calculated.

4.3 Utilisation of OT 6 can be enhanced by increasing the number of surgery performed.

5. Recommendations

- The first scheduled case should start on time, so that subsequent surgeries are not delayed.
- There should be prior booking of equipments and ensure timely availability of equipments by HCA
- The ICU bed should be booked along with the scheduling of the OT surgery.
- The surgery should be scheduled only after financial clearance of the patient.
- Day care surgeries should be confirmed a day prior to scheduled day.
- Patient can be provided with reminder of preoperative instructions and appointment time online or through SMS
- In case of sterilisation cycle failure, extra stock of inventory should be provided to OT.

Closed Medical Record Audit

1. Introduction

A medical record can be defined as a set of documents which contains clinical, administrative, treatment & management related information about a patient in a sequential manner to justify the diagnosis, treatment & the end results.

Need for medical records:

- Patients can retrieve their data for legal purposes, etc
- Doctors use it for tackling any legal issue; doctors can retrieve the patient's record and can justify their treatment.
- Quantity , quality & type of work undertaken in a hospital can be assessed
- It is utilized in conducting research work to study seasonal variation in pattern of diseases, for daily, monthly and yearly census, etc
- Hospitals have to send records of communicable diseases, deaths and births to national and international governmental agencies for registration.

Medical record audit is done to ensure that the patient file has all the essential documents.

Audit of 120 patient files was carried out. A checklist of 58 points was assessed to evaluate the compliance level with medical record documentation.

2.Data analysis

Sl. No.	Criteria	Compliance (in percentage)
Admission and discharge record form		
1.	Final diagnosis mentioned	48.99
2.	Icd coding	37.58
3.	Cause of death	97.28
General consent for treatment		
4.	Signed , named , dated and timed by patient/ gurdian /relative	61.74
Discharge against medical advice		
5.	Signed , named by patient/ gurdian /relative	98.66
6.	Relationship of signatory with patient mentioned	99.33
7.	Date and time mentioned	100
Patient's history examination and plan of care record		
8.	Date/time written by doctor	71.81
9.	Name of informant with relationship of patient	18.79
10.	Vulnerable patient categorized	5.37
11.	Presenting complaints written	98.66
12.	History of present illness written	91.95
13.	Past history written	88.51
14.	Prenatal history(in case of pediatric patient) written	93.96
15.	Developmental history (in case of pediatric patient) written	95.97
16.	Immunizations history(in case of pediatric patient) written	96.64
17.	Feeding /dietary history(in case of pediatric patient) written	95.30
18.	Family history written	61.07
19.	Personal history written	51.01
20.	Gynae & obst history written (for female patient)	73.83
21.	Allergic history written	64.43
22.	Current medication list written	67.79
23.	Physical examination written	89.26

24.	Systemic examination written	93.29
25.	Provisional diagnosis mentioned	89.93
26.	Date / time written on plan of care	28.86
27.	Investigation order mentioned	42.28
28.	Initial nutritional assesment done	77.85
29.	Nutrition / diet order mention	75.84
30.	Plan of treatment written	45.64
31.	Any procedure / surgey need mentioned	34.23
32.	Preventive care mentioned	10.07
33.	Signature of consultant with name date and time written	14.77
34.	Plan of care countersigned by admiting consultant within 24 hrs	24.16
35.	Goals / desired results of treatment, care of service mentioned	11.41
36.	Doctor's orders dated , signed , timed and named	51.68
37.	All prescription orders are clear legible and written in uniform location	88.59
38.	Al procedure performed are recorded dated timed , signed and named	89.12
OPERATIVE AND OTHER INVASIVE PROCEDURES		
39.	All consent forms (surgery, anasthesia, special procedure) signed by patient/ gurdain/ relative	93.69
40.	Pre-anesthesia assessment done and documented	90.60
41.	Operative notes documented and authenticated by chief surgeon	95.30
42.	Post operative plan of care documented	93.29
43.	Surgical safety check list complete	92.62
NURSING RECORDS		
44.	Nursing initial assessment done and documented	98.66
45.	Nursing care plan documented	99.33
46.	Pain screening/assessment done	92.62
47.	Clinival chart completed	97.99
48.	Daily nursing record sheet complete	98.66
49.	Nursing notes legible, signed, named, dated	100.00
50.	Medication adminostration record completed, legible, signed,	96.62

	dated	
51.	High risk medication administered after verification and signed by 2 staff	89.93
52.	Medication chart with error prone abbreviations	79.19
DISCHARGE SUMMARY		
53.	Copy of discharge summary attached	98.64
54.	Discharge summary is complete and signed by consultant	98.64
55.	Discharge summary contain follow up advice and other instruction in understandable manner	98.64
56.	Ischarge summary mentions about when and how to contact in case of emergency	97.96
OTHERS		
57.	Informed consent form for special procedure are complete, signed, named & attached with patient file	100.00
58.	All consent form are legible complete, signed and named by doctor	91.28

ANNEXURE

Adherence to standard admission criteria in ICU

Sr.no	Patient UHID	Admission criteria form present/absent	Criteria for admission	Properly filled	Improperly filled	Not filled

Readmission Rate

Patient UHID	No of times readmitted in ICU in a single hospital stay	Time since shifout from ICU	LOS in ICU	Reason for readmssion

Readmission rate according to ISCCM = (number of readmitted patients within 24 hour of shift out/no of patients managed in ICU)*100

Readmission Rate according to NABH = (No. of return to ICU within 48 hours of shift out/no. of transfers , discharges and deaths in ICU)*100

Utilisation of OT

$$\text{Average TAT of particular OT} = \frac{\text{Total TAT of all surgeries performed in a particular OT during the study period}}{\text{Total no. of surgeries performed during the study period in particular OT}}$$

$$\text{Number of surgeries that can be actually performed} = \frac{\text{Functional working hours of OT(720 mins)}}{\text{Average total time taken for surgery in particular OT}}$$

$$\text{Average total time taken for surgery in particular OT} = \frac{\text{Total time taken for all surgeries in a particular OT during the study period}}{\text{Total no. of surgeries performed in particular OT during study period}}$$

[Total time taken for surgery= time spent on actual surgical procedure + TAT]

References

ICU Planning and Designing in India – Guidelines 2010 **,**Guidelines Committee ISCCM.

History,Intensive Care Unit,Wikepedia

Shirish Prayag, ICUs worldwide: Critical care in India

About ISSCM, ISSCM

Understanding why patients are readmitted ICUs, Bandolier Journal

Operation Theatre Performance, PATH

K.Vinukondaiah, N Ananthakrishnan M. Ravishankar, Audit of operation theatre utilization in general surgery, The National Medical Journal Of India

Hong Choon Oh, Shao Chuen Tong, Jeremy Fung Yen Lim, Assessing the Performance of Operating Rooms: What to Measure and Why?, Proceedings of Singapore Healthcare Volume 20 Number 2 2011

D Hartmann, B Sunjka, Private theatre utilisation in South Africa: A case study

An Audit of Operating Room Time Utilization in a Teaching Hospital: Is There a Place for Improvement, International Scholarly Research