

**Summer Training at
Tata Memorial Hospital, Mumbai
(April - June, 2013)**

- 1. PATIENT INFORMATION BOOKLET.**
- 2. BEING PAPERLESS.**
- 3. PATIENT FEEDBACK ANALYSIS.**
- 4. QUEUING IN GENERAL OPD (GJB).**
- 5. A CASE STUDY ON PNEUMATIC TUBE SYSTEM**
- 6. INFECTION CONTROL IN OPERATION THEATRE.**
- 7. WORK PROCESS AND LICENSING OF BLOOD BANK**

**By
Roopali Sawhney**

**Under the guidance of
Dr. S.D. Gupta**

**Post Graduate Diploma in Hospital and Health Management
2012-2014**



**Institute of Health Management Research,
Jaipur
2013**

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CERTIFICATE

This is to certify that Dr Roopali Sawhney, student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from Institute of Health Management and Research, Jaipur Batch 17th has undergone summer training in TATA Memorial Hospital, Mumbai and has done following projects:

1. Patient Information Booklet
2. Being Paperless
3. Infection Control in Operation Theatre
4. Patient feedback Analysis
5. Queuing in General OPD
6. Pneumatic Tube System
7. Blood Bank Processing and Licensing

The candidate has successfully carried out the mentioned studies assigned to her during summer training from April 8th, 2013 to June 8th, 2013 and her approach to study has been sincere, scientific and analytical.

I wish her success in all his future endeavors.



Dr. SHIV DUTT GUPTA

Director and Mentor
IHMR, Jaipur



Dr. ASHOK KAUSHIK

Dean, Academics and Student affair
IHMR, Jaipur



TATA MEMORIAL HOSPITAL
OFFICE OF THE MEDICAL SUPERINTENDENT

MS 11/0991

June 07, 2013

CERTIFICATE

This is to certify that **Dr. Roopali Sawhney**, Student of PGDHM (2 years) of Institute of Health Management and Research, Jaipur has undergone summer training for 2 months from April 8, 2013 to June 8, 2013 on projects entitled:

- Patient Information Booklet
- Being Paperless
- Patient Feedback Analysis
- Queuing in General OPD (GJB)
- A case study on Pneumatic Tube System
- Infection Control in Operation Theatre
- Work Process and Licensing of Blood Bank

She has successfully completed the projects and her study and performance, code of conduct during the period has been found Satisfactory.

I wish her all success in her future endeavours.

Dr. Narayan HKV 7/6

Medical Superintendent
Dr. Narayan H.K.V.
Medical Superintendent
Tata Memorial Hospital
Parel, Mumbai - 400 012.

ACKNOWLEDGEMENT

Our Special Thanks To

Dr Shiv Dutt Gupta, Director, IIHMR, Jaipur

Mr Narottam Das Sharma, Professor, IIHMR, Jaipur

Dr H K V Narayan (MS, TMH)

Ms Chitra V Hinkneher (QM, TMH)

Head of all the Departments

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ABBREVIATIONS

1. AAMI: Association for the Advancement in Medical Instrumentation
2. AIDS: Acquired Immune Deficiency Syndrome
3. APACHE: Acute Physiology & Chronic Health evaluation
4. ARDS: Acute Respiratory Distress Syndrome
5. CCTV: Closed Circuit Television
6. CCU: Cardiac Care Unit
7. CIS: Central Information System
8. CRI: Cancer Research Institute
9. CRO: Central Registration System
10. CSSD: Central Service Supply Department
11. DNA: Double Nucleic Acid
12. EO: Ethylene Oxide
13. GDP: Gross Domestic Product
14. HIS: Hospital Information System
15. HIV: Human Immune Virus
16. IAEA: International Atomic Energy Agency
17. ICU: Intensive Care Unit
18. ISO: International Organization for Standardization
19. ITU: Intensive Treatment Unit
20. LCD: Liquid Crystal Display
21. MS: Medical Superintendent
22. MRD: Medical record Department
23. NABL: National Accreditation Board of Laboratories
24. OPD: Outpatient Department
25. OSHA: Occupational Safety & Health Administration
26. OT: Operation Theatre
27. PIB: Patient Information Booklet
28. PRO: Public Relation Office
29. PTS: Pneumatic Tube System
30. PVC: Polyvinyl Chloride
31. RCS: Red Cell Separation
32. SAP: Shingolipid Activator Protein
33. SOFA: Sequential Organ Failure Assessment
34. WBC: White Blood Cell
35. TPA: Tissue Plasminogen Activator
36. TMH: Tata Memorial Hospital
37. TTI: Transfusion Transmitted Infections
38. TV: Television
39. UICC: Union for International Cancer Control
40. WHO: World Health Organization

ABOUT THE HOSPITAL

“Service, Research & Education”

The Tata Memorial Hospital was established by the Sir Dorabji Tata under Sir Dorabji Tata Trust on February 28th, 1941 as a centre with enduring value and a mission for concern for the Indian people.

In 1952 the Indian Cancer Research Centre was established as a pioneer research institute for basic research which was later called as the Cancer Research Institute (CRI). Further in 1957 the Ministry of Health took over the Tata Memorial Hospital and later in 1962 transferred the administrative services to the Department of Atomic Energy which was the next major milestone. The Tata Memorial Hospital and Cancer Research Institute merged as the two arms of the Tata Memorial Centre (TMC) in 1966 as a classic example of private philanthropy augmented by Government support with a mandate for Service, Education & Research in Cancer.

TMH is a 550-600 bedded hospital with a special care for cancer patient. Every year 40,000 - 50,000 new patients visit the clinics from all over India and neighbouring countries. Nearly 60% of these cancer patients receive primary care at the hospital of which over 70% are treated almost free of any charges. Over 1000 patients attend the OPD daily for medical advice, comprehensive care or for follow-up treatment.

Nearly 6300 major operations are performed annually and 6000 patients treated with Radiotherapy and Chemotherapy annually in multi-disciplinary programmes delivering established treatments. At the TMH, Evidence Based Medicine is the keystone of our endeavour. Apart from the patient care and service, clinical research programmes and randomized trials contribute to improve delivery of care and highest standards of work ethics. Surgery remains the vital form of treatment along with radiation therapy and chemotherapy. The strategies for early diagnosis, treatment management, rehabilitation, pain relief and terminal care have been established in a comprehensive and multidisciplinary approach for a total cancer care programme.

The Tata Memorial Centre is a recognized training Centre for cancer education and research by national and international organizations such as WHO, IAEA and UICC. Tata Memorial Hospital is a post-graduate teaching centre and is affiliated to the Homi Bhabha National Institute (HBNI) (Deemed University) under Department of Atomic Energy, Government of India, and National Board of Examinations. Every year about 80 post-graduate students register with the Centre for doing their Master's or Doctorate courses. There are about 450 students undergoing training every year in medical and non-medical and Advanced PG Diploma in technical fields from this centre and Maharashtra State Board of Technical Education, Mumbai Region (MSBTE) in long and short term course.

DEPARTMENTS VISITED

1. Operation Theatre
2. ICU
3. Radio diagnosis
4. Rehabilitation Centre
 - I. Physiotherapy
 - II. Occupational Therapy
5. Oncology
 - I. Radiation
 - II. Medical
 - III. Preventive
6. CSSD
7. Tissue Bank
8. Transfusion Medicine
9. Dental
10. Sample Collection
11. OPD
12. IPD
13. Nursing
14. Laboratories
 - I. Biochemistry
 - II. Cytology
15. Dietary & Nutritional Department
16. Linen & Laundry
17. MRD
18. Dispensary
19. CRO
20. Ancillary
 - I. MSW
 - II. Palliative
 - III. PRO
 - IV. Day Care Centre
 - V. Psychiatry
21. Other Departments
 - I. HRD
 - II. Accounts & Finance
 - III. IT
 - IV. Security

INTENSIVE CARE UNIT

An Intensive Care Unit (ICU), also known as a Critical Care Unit (CCU), Intensive Therapy Unit or Intensive Treatment Unit (ITU) is a special department of a hospital or health care facility that provides intensive-care medicine.

Intensive Care Units cater to patients with the most severe and life-threatening illnesses and injuries; that require constant, close monitoring and support from specialist equipment and medication in order to maintain normal bodily functions. They are staffed by highly trained doctors and critical care nurses who specialize in caring for seriously ill patients. Common conditions that are treated within ICU's include those such as trauma, multiple organ failure and sepsis.

Patients may be transferred directly to an Intensive Care Unit from an Emergency Department if required, or from a ward if they rapidly deteriorate; or immediately after surgery if the surgery is majorly invasive and the patient is at high risk of complications.

PURPOSE

The purpose of the intensive care unit (ICU) is simple even though the practice is complex. Healthcare professionals who work in the ICU or rotate through it during their training provide around-the-clock intensive monitoring and treatment of patients seven days a week. Patients are generally admitted to an ICU if they are likely to benefit from the level of care provided. Intensive care has been shown to benefit patients who are severely ill and medically unstable—that is, they have a potentially life-threatening disease or disorder.

Although the criteria for admission to an ICU are somewhat controversial—excluding patients who are either too well or too sick to benefit from intensive care—there are four recommended priorities that intensivists (specialists in critical care medicine) use to decide this question. These priorities include:

- Critically ill patients in a medically unstable state who require an intensive level of care (monitoring and treatment).
- Patients requiring intensive monitoring who may also require emergency interventions.
- Patients who are medically unstable or critically ill and who do not have much chance for recovery due to the severity of their illness or traumatic injury.
- Patients who are generally not eligible for ICU admission because they are not expected to survive. Patients in this fourth category require the approval of the director of the ICU program before admission.

ICU care requires a multidisciplinary team that consists of but is not limited to intensivists (clinicians who specialize in critical illness care); pharmacists and nurses; respiratory care therapists; and other medical consultants from a broad range of specialties including surgery, paediatrics, and anaesthesiology. The ideal ICU will have a team representing as many as 31 different health care professionals and practitioners who assist in patient evaluation and treatment. The intensivist will provide treatment management, diagnosis, interventions, and individualized care for each patient recovering from severe illness.

TMH ICU

The Intensive Care Unit consists of an 11 bedded critical care area and a 22 bedded recovery room/step down unit. The unit has 24 hour coverage by a consultant and junior medical staff. Several consultants of the department rotate in the ICU on a monthly basis, many of whom have received specialisation training in intensive care at various centres abroad. The unit aims at providing high quality intensive care for the critically ill cancer patients.

Patients include critically ill surgical patients, patients with acute medical illness, co-orbed conditions and patients with haematological malignancies, neutropenia and chemotherapy related complications. These patients have complex problems like Sepsis, ARDS, and multi-organ failure, many having acute hemodynamic, respiratory and metabolic derangements.

The unit is equipped with well trained intensives and state of the art amenities to provide the entire range of intensive care services including airway management, mechanical ventilation, circulatory support including advanced hemodynamic monitoring, and renal support with dialysis or hem filtration, enthal /parenteral nutrition, blood component therapy, sedation, pain relief and other supportive measures.

Emphasis is given to the importance of a multidisciplinary approach to critical care. The unit has a team of specialised nurses, physiotherapists, dieticians, technical and paramedical staff who are actively involved in the supportive care of the patients. The ICU also takes consults from various services as and when required.

The ICU has several quality assurance programmes and ongoing audits. Severity scoring of patients is done using APACHE II, SAP II, Groegar and SOFA scores and entered into a database. Ongoing collection and analysis of microbiology culture data is used to identify ICU infection patterns. Various protocols and audits including one for airway accidents and outcome of patients with haematological malignancies have been implemented to evaluate and improve the quality of care in the ICU.

DESIGN: It is circular in nature with different cubical blocks. It comprises of recovery wards and one isolation ward.

RECCOMDATIONS:

1. Sterilisation of the ICU should be maintained by providing gowns, masks and caps to the patients attendants even if they are visiting for shorter duration of time.
2. Atmosphere should be peaceful.
3. All the non working equipments kept in one of the cubical of ICU should be shifted to the suitable place so that the area can be utilised for patients.
4. Manpower should be increased.

CENTRAL STERILE SERVICE DEPARTMENT (CSSD)

“No Stronger Condemnation of any hospital or ward could be pronounced than the single fact that Zymotic (infectious) diseases have been originating in it, or that such diseases have attacked other patients than those brought in with them.”

“Florence Nightingale”

CSSD is a specialised area responsible for the collecting, decontamination, assembling, packing, sterilisation, storing and distribution of sterile goods and equipment to patient care areas i.e. OT, ICU, Emergency, Surgical suites, Laboratories, wards, OPD. It is carried out by trained personnel to ensure better control and reliable results and reduces risk of infection.

OBJECTIVES

- To provide sterilized material from a central department where sterilizing practice is conducted under conditions, which are controlled, thereby contributing to a reduction in the incidence of hospital infection.
- To take some of the work of the Nursing staff so that they can devote more time to their patients.
- To avoid duplication of costly equipment's, which may be infrequently used.
- To maintain record of effectiveness of cleaning, disinfection and sterilization process.
- To monitor and enforce controls necessary to prevent cross infection according to infection control policy.
- To maintain an inventory of supplies and equipment.
- To stay updated regarding developments in the field in the interest of efficiency, economy, accuracy and provision of better patient care.
- To provide a safe environment for the patients and staff.

FUNCTIONS

- Receiving and sorting the soiled material used in hospital.
- Carrying out the process of decontamination or disinfection prior to sterilizing.
- Carrying out specialized cleaning of equipments and supplies.
- Inspecting and testing instruments trays, sets, linen packs etc.
- Packaging all materials for sterilizing.
- Sterilizing
- Labelling and dating materials.
- Storing and controlling inventory.
- Issuing and distributing.

TERMS RELATED TO CSSD

- Sterilization: It is the destruction or removal by filtration of all microorganisms, including bacteria, viruses, fungi and prions. It is conceived as an absolute absence of infective agent.
- Disinfection: It describes a procedure or treatment to render a contaminated item into a state that it will be no more infectious. The procedure implies the destruction of bacteria, viruses and fungi but not their spores.

- Antisepsis: It is a process involving the destruction or inhibition of microorganisms in living tissues thereby limiting or preventing the harmful effects of infection.

RATIONALE APPROACH TO DISINFECTION AND STERILIZATION

SPAULDING CLASSIFICATION

- Critical items: Objects that enter sterile tissue or vascular systems are classified as critical, and should be sterilized.
- Semi-critical items: Semi-critical are those that come in contact with mucous membrane or non-intact skin. These devices should be disinfected.
- Non-critical item: Non-critical items are those that come in contact with intact skin but not mucous membrane.

PLANNING OF CSSD

It is classified into two parts:

1. Central Unit: It is responsible for receiving dirty utilities, cleaning, processing, sterilizing, storage and supply. It has three zones separated by two distinct barriers. One collection window and one supply window on the other end.
2. Peripheral Unit: It is mainly responsible for distributing

The size and location usually depends on the number of the hospitals the CSSD will serve as well as the number of beds and the future expansion of the hospital. However seven to 10 square feet per bed is recommended as an area of requirement for the CSSD.

According to Thomson an area of 2000 square feet for a 500 bedded and 3500 square feet for 1000 bedded hospital will be adequate for Indian conditions.

- There should be no back tracking of sterile goods.
- The materials/ items from contaminated and sterile areas should not get mixed.
- There should be physical barrier between clean and dirty areas.
- The floor should be smooth, impervious, non skid and robust.
- Light fittings should be recessed
- Relative humidity should be maintained at 45 ± 5 per cent
- The clean area should be provided with air locks and maintained at positive pressures relative to the adjoining spaces. The minimum ventilation rate should be six to 10 air changes per hour.
- The work area should be made of marble / granite / stainless steel
- The sterilisation must be planned for autoclaving by steam as well as by gas since certain items such as rubber; plastic or delicate instruments cannot be autoclaved.

Location: The CSSD should be close to the casualty, operation theatre and wards which are the largest consumer of the sterilised material. In multi-storeyed buildings CSSD may be

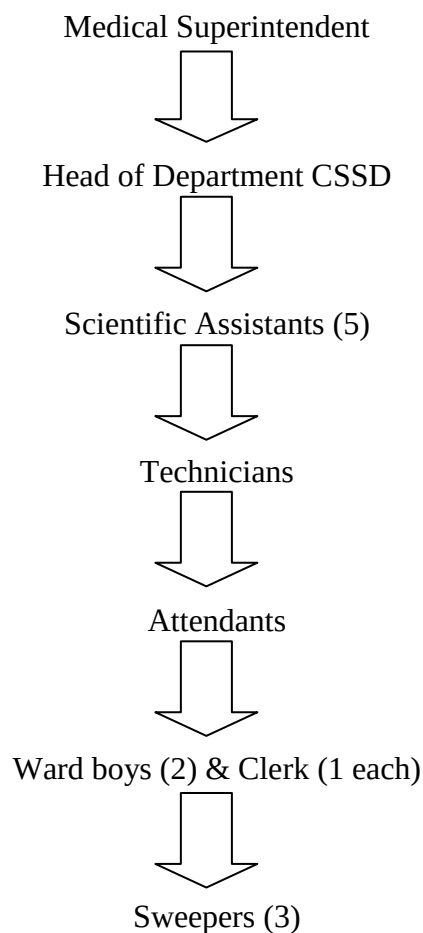
planned in the lower floor right under the operation theatre where vertical movement will be the quickest possible movement of the material.

LAYOUT

The CSSD should have four zones for a smooth work flow:

1. Dirty Area (Zone I): Receiving, Inspecting and Decontamination.
2. Clean Area (Zone II): Assembling and Packing.
3. Sterile Area (Zone III): Sterilizing.
4. Issue Area (Zone IV): Storage and Distributing.

ORGANOGRAM



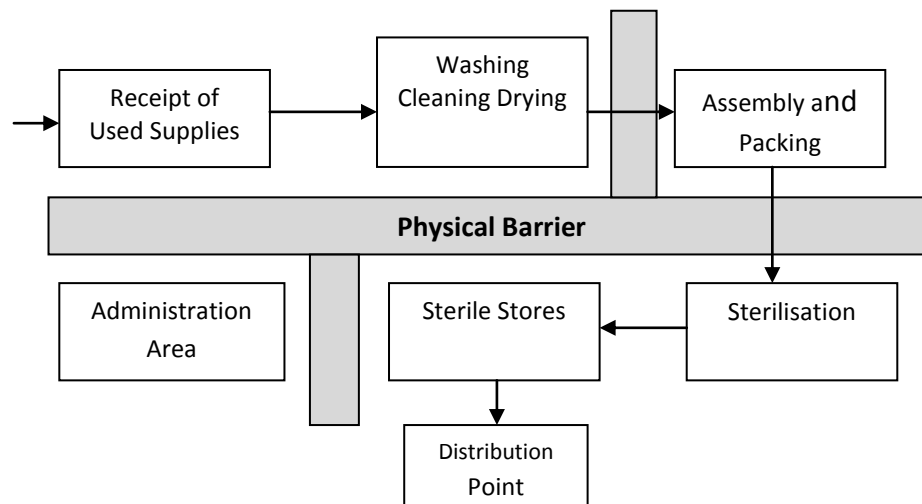
STAFFING

It should be planned based on following factors:

1. Three shift working
2. Messenger servicer
3. Maintenance service
4. Staff for 6 areas
5. Leave and off
 - Average 02 technicians for 100 beds and 1 technical supervisor.

- 1 clerk for keeping records, accounting and supply shift.
- Average 04 attendants per 100 beds in all shifts.
- Average number of cleaning attendants and transporters.
- 01 technician and 02 attendants to be stationed at each zone.

WORK FLOW



- Reception: There should be a counter and reception window for receiving the items to be sterilized.
- Rinsing: Rinsing of articles after use should not be permitted in patient care areas unless carried out by a trained member of the staff. It should be done in CSSD.
- Cleaning: All reusable medical devices should be thoroughly cleaned prior to disinfection or sterilization. Ultra-sound cleaners are used to remove dried blood from used instruments.
- Drying: All articles should be dried appropriately
- Inspection and Assembly: Each item should be inspected for functionality, defects, breakage and then appropriately assembled.
- Packaging: Articles should preferably be packed in porous material to allow penetration of steam.
- Labeling: Each pack should be marked with nomenclature of the article, contents of the pack, initials of the person who packed it, date and initials of the person who carried out the sterilization.
- Sterilization: The operation of the sterilizer should be entrusted to a responsible and fully trained person. All records about pressure and temperature should be maintained.
- Validation: Validation is the process of ensuring correct sterilization technique and results. Various types of tests are available for validation which will be discussed in later part of the chapter.

- **Storage:** Should be properly managed separately for sterile and non-sterile stores. For sterile goods, clean room conditions should be followed.
- **Distribution:** Refers to clean and dirty articles exchange system. A system should be established for the collection of used items from patient care areas and distribution of sterilized goods.

STERILISING TECHNIQUES

No sterilization method sterilizes all healthcare products and materials without some damage or destruction. Consequently, sterilization methods must be selected after much consideration, evaluation, and review of their parameters and effects. Following are the sterilization methods used in hospitals:

- Moist heat i.e. boiling water or steam
- Dry heat i.e. incineration, flaming, hot air ovens
- Gaseous i.e. Ethylene oxide (EO), Plasma sterilization (H_2O_2), ozone sterilisation
- Chemical sterilisation
- UV light
- Gamma Rays (Cobalt 60)

(a) Sterilisation by Steam: The steam sterilization cycle consists of five phases.

- **Phase 1 - Air elimination:** execution of several cycles of air elimination, the presence of which might hinder or prevent steam penetration or heat transfer on the item to be sterilized. Air elimination can be by gravity or by vacuum.
- **Phase 2 - Heating:** the steam is injected in steriliser which causes heating of load kept for sterilisation and the elimination of the resulting condensate.
- **Phase 3 - Sterilization:** the sterilization phase during which the content is sterilized using saturated steam over a specific period of time. Pressurised steam has higher temperature than of steam at normal atmospheric pressure. The time of sterilisation depends on the temperature of pressurised steam.
- **Phase 4 - Emptying/Drying:** the elimination of steam during the emptying phase followed by a drying vacuum.
- **Phase 5 - Aeration:** the chamber is aerated via a sterile filter to atmospheric pressure and the load is then removed.

(b) Dry Heat Sterilization: should be used to sterilize anhydrous (waterless) items that can withstand high temperatures. Dry heat sterilizers are not commonly found in healthcare facilities today. If used, it is generally to sterilize talcum powder for surgical procedures. Dry heat sterilization may be used to sterilize sharp instruments, such as dental instruments, burs, and reusable needles that would be damaged by the moisture of steam

(c) Gaseous Sterilization: Ethylene oxide, hydrogen peroxide and ozone are the gases commonly used for sterilization.

CSSD OF TATA MEMORIAL CENTRE

The department is located in 3rd floor of service building of TMH. It is centralized but the laundry service is outsourced. It is divided into four zones and is spread over 3000 sq ft. The allotted budget for the year 2013-2014 is 2 crores.

EQUIPMENTS AND TECHNIQUES

- Steam steriliser -4 big and one flash steriliser
- Gas steriliser-1
- Plasma steriliser-1
- Ultrasonic cleaner-1
- Linen steriliser-1
- Instrument disinfectant-1
- Demineralizer -1 (but not in working condition)

The following records are maintained for all sterilization equipment:

- Date of service
- Model and serial number
- Location
- Descriptions of replaced parts
- Biological testing records
- Bowie-Dick test
- Name and signature of controller

Steam sterilizer: Ethylene Oxide is used at 134°C temperature for 45-50 min for 30 pounds and 121°C for 55 mins for 20 pounds. At a time 140 surgical gowns are sterilised.

Disadvantages of 100% ethylene oxide:

- It is flammable
- Acute EO Toxicity:
 - Inhalation- dizziness, weakness, nausea, vomiting, chest pain, irritation of resp. tract.
 - Eye contact - severe irritation.
 - Skin contact- irritation, blisters, dermatitic reaction
 - Ingestion- severe irritation (mucosa)

- Chronic Toxicity:
 - Potential
 - Carcinogen
 - Mutagenic
 - Reproductive hazard

OSHA Regulations: Permissible exposure limit-1 ppm for 8 hrs TPA.

Aeration of EO sterilized items: Sterilized items absorb EO

Aeration is process that removes EO.

- Rinsing with H₂O does not remove residual EO
- Mechanical aeration is recommended
- Device manufacturer must provide aeration recommendations

Factors influencing aeration times:

- Material type (device & packaging)
- Physical dimensions
- Sterilization parameters
- Aeration parameters
- Loading configuration

Aeration Guidelines:

- Eight hours @ 60 °c
- Twelve hours @ 50 °c

Based on aeration of PVC and suggested by AAMI, AHA.

Gas Sterilization: Major features and benefits:

- accurate and dependable
- continuous temperature monitoring
- humidification assurance
- single-dose cartridge
- negative pressure
- vacuum controlled puncture
- cycle status display
- manual cycle interrupt
- automatic aeration

General Information:

- Temperature

- 37° C (99° F)
 - 55° C (131° F)
- Gas exposure time
 - Warm 1 hrs
 - Cool 3 hrs
- Total cycle time approx.
 - Warm 3 hrs 30 min
 - Cool 5 hrs 30 min.

It is done for one cycle per hour and two cycles for four hours.

Plasma Sterilization

Staffing: The staff works in three shifts morning, day and night.

- In morning shift, there are 10 staff members including 1 sweeper for cleaning, sterilisation, dressing preparation and OT preparation
- In day shift, there are 10 personnel working including 01 sweeper.
- In night shift, 03 personnel work on steam and plasma sterilization and linen sterilization.

According to Government guidelines there should be 01 technician for every 10 beds. But in TMC, it has only 33 personnel including MS and Head of Department.

RECOMMENDATIONS:

- Manpower should be increased to reduce the workload.
- Demineraliser should be repaired but as the company has stopped manufacturing the same so buy the new one. It is very time consuming to wash the instruments with distal water.
- Buffer of disposable items should be maintained so that in any emergency or during requirement it can be used. As the supply of intend was delayed during our visit and the department faced shortage.

PUBLIC RELATION OFFICE

“Managing Communication”

"A management function, which tabulates public attitudes, defines the policies, procedures, and interests of an organization... followed by executing a program of action to earn public understanding and acceptance."

Ivy Lee and Edward Louis Bernays

Public Relation is an art and science of managing communication between organization and its public. It includes both internal and external public and gives exposure to both organisation and individual about latest updates and news on the topics of their interest that do not require direct payment. The aim of public relations of any organization is to persuade the public, investors, partners, employees, and other stakeholders to maintain a certain point of view about it, its leadership, products, or of political decisions.

COMMON ACTIVITIES

- Speaking at conferences
- Winning industry awards
- Working with the press
- Employee communication
- Formulation and implementation of organizational programs and policies.
- Developing and maintaining rapport of the organization.
- Evaluation of public opinions and attitudes.

METHODS, TOOLS, AND TACTICS

Specific public relations disciplines include:

- Financial public relations – communicating financial results and business strategy
- Consumer/lifestyle public relations – gaining publicity for a particular product or service
- Crisis communication – responding in a crisis
- Internal communications – communicating within the company itself
- Government relations – engaging government departments to influence public policy

Within each discipline, typical activities include publicity events, speaking opportunities, press releases, newsletters, blogs, social media, press kits and outbound communication to members of the press. Video and audio news releases (VNRs and ANRs) are often produced and distributed to TV outlets in hopes they will be used as regular program content.

Building and managing relationships with those who influence an organization or individual's audiences has a central role in doing public relations. Public relations practitioner

has been working in the field; they accumulate a list of relationships that become an asset, especially for those in media relations.

AUDIENCE TARGETING

A fundamental technique used in public relations is to identify the target audience, and to tailor messages to appeal to each audience. Sometimes the interests of differing audiences and stakeholders common to a public relations effort necessitate the creation of several distinct but complementary

MESSAGING

Messaging is the process of creating a consistent story around a product, person, company or service. Messaging aims to avoid having readers receive contradictory or confusing information that will instill doubt in their purchasing choice or other decisions that have an impact on the company. Brands aim to have the same problem statement, industry viewpoint or brand perception shared across sources and mediums

SOCIAL MEDIA MARKETING

Digital marketing is the use of Internet tools and technologies such as search engines, Web 2.0 social bookmarking, new media relations, blogging and social media marketing. Interactive PR allows companies and organizations to disseminate information without relying solely on mainstream publications and communicate directly with the public, customers and prospects

OTHER TECHNIQUES:

Ethics

The field of public relations is generally highly un-regulated, but many professionals voluntarily adhere to the code of conduct of one or more professional bodies to avoid exposure for ethical violations. The Chartered Institute of Public Relations, the Public Relations Society of America and The Institute of Public Relations are a few organizations that publish an ethical code.

SPIN

Spin has been interpreted historically to mean overt deceit meant to manipulate the public, but since the 1990s has shifted to describing a "polishing of the truth. Today spin refers to providing a certain interpretation of informant meant to sway public opinion. Companies may use spin to create the appearance of the company or other events are going in a slightly different direction than they actually are. Within the field of public relations, spin is seen as a derogatory term, interpreted by professionals as meaning blatant deceit and manipulation. Skilled practitioners of spin are sometimes called "spin doctors".

The techniques of spin include selectively presenting facts and quotes that support ideal positions (cherry picking), the so-called "non-denial denial," phrasing that in a way presumes unproven truths, euphemisms for drawing attention away from items considered distasteful, and ambiguity in public statements. Another spin technique involves careful choice of timing in the release of certain news so it can take advantage of prominent events in the news.

ROLE OF PUBLIC RELATIONS OFFICER

A public relations officer (PRO) also known as Media Specialist is the spokesperson of a company or any organization. The role of a public relations officer is to convey the policies and interests of the organization to the public through various forms of media. The need for public relations officer can be found in almost all sectors, including advertising companies, government agencies, election commissions, etc.

The main job of a public relation officer is to develop and maintain the reputation of the company or organization. It is the responsibility of the PR officer to promote the products or services of the establishment he works in. He does this by organizing press conferences, exhibitions, publishing articles in the newspaper or on the official website of the government department / company. When a company has to launch a new product, it is the job of the PR official to make arrangements to promote it. He has to plan promotional strategies, keeping the target audience in mind.

Characteristics of PRO

- Should be an outgoing person as he has to interact with lots of people.
- Capable to give reply to the queries of public.
- Able enough to solve the issues between the organization and the public.
- Trustworthy

PRD OF TATA MEMORIAL HOSPITAL

SEGMENTS: Public relation department has various segments:

- Helpline desk
- Enquiry registration
- Volunteer ward

HELPLINE DESK: This segment helps people to locate the exact location of the area they are visiting. From this the distribution of food from Taj Group is done for the general patients and for the distribution of other services provided for the patients whether its food, clothes etc.

ENQUIRY REGISTRATION: It also comes under PRD. Registration of patients and any assistance if required.

VOLUNTEER WARD: Workers from many organisation come to serve the patient on voluntary basis.

LOCATION: It is located in the Home Baba Block and the Helpline desk is in Golden Jublie Block.

The main function of the department is to create positive image in the mindset of both internal and external public and this is done with the help of MEDIA. Media plays a very important role in creating image of the organization. Its external and internal public includes:

- External Public
 - Government
 - Political parties
 - Funding agencies
 - Other hospitals
 - Medical insurance companies
 - Health care organisations like :NGOs
- Internal Public
 - Hospital and its Employees
 - Patients and their relatives: Being it a hospital industry patient and their relative are the most important resource.

SERVING ORGANISATION:

1. TATA Group: It is providing lunch to general patients from last 7-8 years.
2. MAKE A WISH FOUNDATION; It seeks at fulfilling the one wish of paediatric patient
3. Other Organisations: Giving their services to general patients in terms of providing them with food, clothes etc

MEDICAL RECORD DEPARTMENT

“Records through which hospital statistics are generated”

The terms medical record defines the systematic documentation of a single patient's medical history and care across time within one particular health care provider's jurisdiction. It includes a variety of types of "notes" entered over time by health care professionals, recording observations and administration of drugs and therapies, orders for the administration of drugs and therapies, test results, x-rays, reports, etc. The maintenance of complete and accurate medical records is a requirement of health care providers and is generally enforced as a licensing or certification prerequisite.

It is a systematized way of storing the required data, information and other relevant documents with the objective of making easy availability of necessary data at the time of its need.

The term is used for both the physical folder that exists for each individual patient and for the body of information found therein.

Medical records contain the sensitive information of the patient and s/he will wish the information to be kept confidential. To maintain the privacy, many [ethical](#) and [legal](#) issues are implicated, such as third-party access and appropriate storage and disposal. Although the storage equipment for medical records generally is the property of the health care provider, the actual record is considered in most jurisdictions to be the property of the patient, who may obtain copies upon request.

To meet legal requirements and avoid complications it should be:

- Complete
- Accurate
- Adequate
- Legible

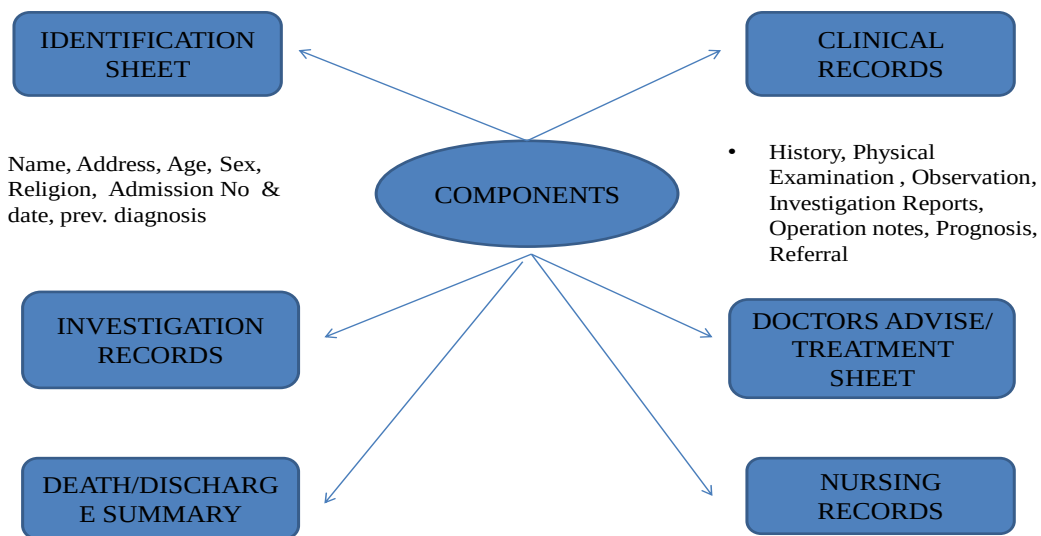
PURPOSE

Main Purpose: The information contained in the medical record allows health care providers to determine the patient's medical history and provide informed care. It serves as the central repository for planning patient care and documenting communication among patient and health care provider and professionals contributing to the patient's care.

Auxiliary Purpose: The individual medical record anonymously may serve as a document

- to educate medical students/resident physicians
- to provide data for internal hospital auditing and quality assurance, and
- to provide data for medical research and development.

COMPONENTS



FUNCTIONS

- Completion and procession of hospital statistics and preparation on different periodic reports on morbidity and mortality.
- Completion of hospital census report.
- Maintenance and retrieval of records for patient care and research study.
- Arrangement and supervision of OPD registration, enquiry and admission office.
- Dealing with medico legal records and attending the courts on summary.
- Disease surveillance.

DATA OBTAINED FROM MEDICAL RECORDS: It is of two types

1. Discharge Analysis: Data, Census, bed strength, average length of stay, discharge, death, complications etc
2. Epidemiological Information: Incidence, prevalence, disease specific death etc.

LOCATION: It is located in the ANEX building Vth floor

SURACE AREA: It occupies 3000sq ft at Vth and VIth floor of ANEX building.

RETENTION SCHEDULE: TMH is maintaining medical records for 10years.

CONSTRAINTS AND REMADIES:

- Records have to be kept for 10yrs.
- Huge space is required.
- Retrieval of records is difficult.

To overcome these issues the hospital is going fully digitalised.

Features

Earlier the department was working on papers but from this year 2013, the hospital is going paperless.

- Entering the details of all the old and new patients on the computer.
- Providing all the patients (old and new) a smart card which they have to keep and have to bring it along with them whenever they come for follow-up.
- Providing patients with a unique id. Unique id is considered as “Case No”. It is done in alphabetical order like AA, AB, AC, AD etc. But ignoring a few alphabets which can create problem e.g. “O” can be read as “0” (zero). It was started with AA but now reached to CK. Along with this; patient’s visit rank is also given in numerical order. Example CK 121, means 121st patient of the year 2013. This helps in giving figures that how many patients have visited the hospital in a single year. The first alphabet is changed after a decade and second is changed every year.
- For follow-up cases, a week’s patients file reach to the respective OPDs.
- TMH has developed software known as “Cancer Registry System”. In this all the patients are registered with all the details.

Medical record is note - worthy for the country in several aspects. Since medical record contains various facts like-personal details of patient, illness, diagnosis, modus operandi used to find out the disease, seriousness of diseases, medicines being used by patients in the recommendation of his/her attending doctors and even the clear names and signature of attending doctors, the nation can attain the health relating information through thorough check up of such medical records. The government can avail of such records in the direction of making short as well as long term health strategies. An integrated study of medical records available in all the hospitals and health centres will contribute towards knowing the health condition of people, ailment stricken areas, cause and effects of disease, availability of health workers as well as physical facilities and resources in order of delivering the appropriate health service to the people.

TISSUE BANK

“India’s only ISO 9001-2000 certified”

“Transforming Lives through Tissue Transplantation”

The department was established in 1988 in collaboration with the International Atomic Energy Agency (UN) to bank amnion, skin and mineralised and demineralised bone. It was the 1st tissue bank that started in India.

THE NEED FOR A TISSUE BANK: Ideally, the best replacement tissue following trauma, disease or surgery, is the patient’s own tissue (auto graft) however, banked tissues;

- Eliminate the risks and expense of additional incision necessary for acquiring an auto graft.
- Prevent the creation of a permanent defect in the tissue recovery site.
- Provide the surgeon with a variety and quantity of tissue which otherwise may not be available, especially in children.

OUR MISSION

- To provide safe, reliable and cost effective tissues for transplantation.
- To offer training for the setting up of tissue banks
- To assist health authorities in developing guidelines and regulations for tissue banking
- To conduct research to enhance the properties of tissue transplants
- To promote tissue donation.

SOURCES OF BANKED TISSUES

- Amniotic membranes are donated by mothers following the birth of their babies.
- Musculoskeletal tissues are donated by persons undergoing primary joint replacement surgery, treatment for femoral neck fracture, or trauma surgery.
- Tissue is donated posthumously from deceased donors with the consent of next of kin.

SAFETY OF ALLOGRAFTS

At the TMH tissue bank the donor’s blood is screened to rule out HIV/AIDS, hepatitis B and C, and syphilis. The tissues are processed to destroy microorganisms and reduce antigenicity, preserved by freezing or freeze drying and packaged in a sterile environment. The final product is sterilized by the gamma radiation at ISOMED, the ISO 9002 certified radiation plant of government of India. They have a shelf life of 3 years and can be stored at room temperature as ready to use packs.

IMMUNE REACTION

There are no problems of rejection as the transplantation antigen is destroyed during processing. Tissue typing is therefore not necessary, and anti rejection drugs are not required in the recipients of the allograft.

EFFICACY

Banked skin and amnion are excellent biological dressings and are used externally as temporarily wound covers. Amnion requires no adhesives and peels off on its own as healing progresses. Its use avoids the need for repeated, painful dressings, reduces the time of healing and gives better long term results than routine dressings.

USES OF AMNION

- Burns
- Ulcers
- Unresponsiveness bedsores and abscesses
- Leprosy lesions
- Skin grafts donor sites and wounds
- Raw areas following dermabrasion and laser treatment
- Ocular surface and orbital defects
- Oral defects (barrier membrane)
- Vaginoplasty

DONATED BONE: It is among the most transplanted tissues in the world, second only to blood. It is used to:

- Reconstruct skeletal defects
- Provide structural support during fracture during fracture healing particularly when there is non-union.
- Reinforce bone that has been weakened, as in patients with osteoarthritis and those undergoing revision joint replacement surgeries.
- Correct spinal deformities.
- Treat bone defects resulting from the removal of tumours.
- Replace cancerous bone enabling patients to stand and walk normally again sometimes preventing the amputation a limb.

FEE

The TMH tissue bank is a non profit facility. The nominal fee charged contributes towards the cost of resources and infrastructure necessary for tissue recovery, serological and microbiological tests to ensure its safety processing quality control research to develop more effective grafts, and awareness campaigns conducted to promote tissue donation and utilisation.

CHARGES

- For amniotic tissue (large size): Rs 430/-
- For mineralised bone: Rs 325/-
- For demineralised bone: Rs 630/-

WORK FLOW

Before taking any tissue for further processing consent is taken from the donor and all required blood tests are performed to detect any disease.

STEPS

1. Pasteurization: It is done at 60 degree Celsius
2. Alcoholation
3. Tissue is froze at -45 to -50 degree Celsius
4. Packed
5. Sent for sterilization at Tormbay Thermal Power Station once or twice a week depending upon the load.
6. Ready for issue.

MANPOWER: Only 8 personnel work in this department but it requires at least 2 more personnel to do the work more efficiently. This will help dividing the work equally and no single personnel can be over loaded with the work.

SURFACE AREA: 800 sq ft, this space is not sufficient for the department. It has to be increased for more effective working.

These grafts have shown effective results and heal the wound quickly. It is very thin and easy to apply. In the year 2012, 157 bone grafts were used by 70 patients and 1869 amniotic tissue grafts were used by 227 patient.

BIOCHEMISTRY

"The chemistry of life" Study of the structure and properties of molecules in living organisms and how those molecules are made, changed, and broken down"

Biochemistry, sometimes called biological chemistry, is the study of chemical processes within, and relating to, living organisms. By controlling information flow through biochemical signalling and the flow of chemical energy through metabolism, biochemical processes give rise to the complexity of life. Over the last 40 years biochemistry has become so successful at explaining living processes that now almost all areas of the life sciences from botany to medicine are engaged in biochemical research. Today the main focus of pure biochemistry is in understanding how biological molecules give rise to the processes that occur within living cells, which in turn relates greatly to the study and understanding of whole organisms.

Biochemistry is closely related to molecular biology, the study of the molecular mechanisms by which genetic information encoded in DNA is able to result in the processes of life. Molecular biology can be thought of as a branch of biochemistry, or biochemistry as a tool with which to investigate and study molecular biology.

ABOUT THE DEPARTMENT

The department of biochemistry consists of three parts:

1. Main Biochemistry Laboratory
2. Tumour marker services
3. Emergency services.

FUNCTIONS OF THE DEPARTMENT

- With the help of tests, it provides support in diagnosis and planning out treatment plan for patients while maintaining high standards of ethical practice with clinical colleagues, patients and staff to meet the international standards of quality assurance.
- It issues reliable and dependable reports in minimum possible turnaround time. For Biochemistry and tumour markers, it is 4 hours, in emergency situation, it is 2 hours and for hematologic test, it is 30th minutes. Blood gases and glucochek are reported immediately.

EQUIPMENTS: The department is equipped with fully automated state of art sophisticated analyzers and most of the analyzers are interfaced with the HIS (hospital information system) online for fast report generation. Following are the equipments present in the department:

- Olympus AU 640
- Dade Dimension RXL
- Architect, Axsym and Daytona analyzers

- Automated protein electrophoresis analyzers
- Immage 800

The longevity of the equipments is 5years. The equipments are repaired and maintained on regular intervals to reduce the chances of error to near negligible, otherwise it will give faulty results and this will affect the treatment plan of patients.

SERVICES PROVIDED

- Biochemical tests: blood gases, glucose, renal function test, electrolyte, cardiac profile, calcium, iron calcium, magnesium, lactate and liver function test.
- Tumour markers
- Protein electrophoresis
- Immunofixation
- Haematology: WBC, Haemoglobin, Platelet, Prothrombin Time and Partial Thromboplastin time and International normalised tests ratio.

These are done to monitor patients on therapy and also to do preoperative and postoperative evaluation of surgical patients.

WORK FLOW

1. Sample Collection: Sample collection is done by trained scientific officers, scientific assistants, phlebotomists, technicians and nurses.
 - For Outpatients : Room No. 32, Private OPDs, Main Building (timings: 7.30am - 1:30pm & 2.00pm - 3.30pm),
 Room No. 157, Basement, Golden Jubilee Building (timings 8:00am – 4:00pm)
 Room No. 11, Third Floor, Service Block Building (timings: 9:00am - 12.15pm)
 - For Inpatients: Emergency lab, OT complex, Second Floor, Main Building Functions round the clock.
2. Acceptance by checking bar codes
3. Segregation into different types of test to be performed
4. Testing
5. Reporting: Results are automatically updated on the patients profile as the system is fully computerised.

MANPOWER: The department has 30 personnel including scientific officers, medical technicians and support staff. All the staff members have been allotted with specific task i.e.

the work is divided among the personnel stepwise. On an average 1000 tests per day are done in the department.

BUDGET: On an average every year the department spends 5-6 crores in patient care service.

ACCREDITATION: The Department of Biochemistry is accredited by NABL under the ISO 15189 guidelines in the year November, 2005.

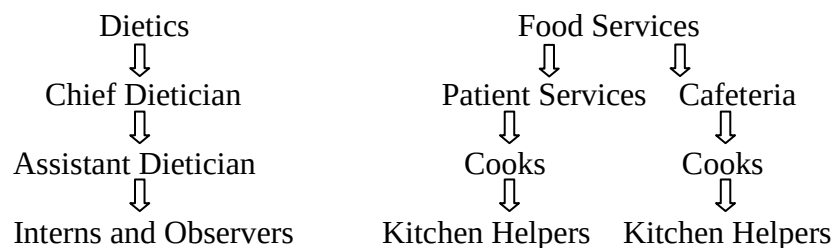
The department is well managed and is putting tremendous efforts in the field of research. It is supporting the medical personnel by issuing accurate reports within minimum possible time to help them plan the treatment protocol for patients. This is beneficial for both the hospital and patients. This makes the department s very important part of the hospital.

DIETARY AND NUTRIETIONAL DEPARTMENT

The Dietary and Nutritional Department is very important department of the hospital. For cancer speciality hospital it becomes the most important. Cancer patients are very weak as their blood count; leukocyte count etc is very low. These counts have to be maintained for treatment, if these counts are under normal limits then treatment can be delayed and this will be dangerous for the patient. Not only for patients but also for treating team. With proper treatment it provides support to patients in terms to be capable to tolerate the heavy doses of medicines.

DIVISION OF DEPARTMENT WITH HOERACHY

The department has two sub parts: Dietics and Food Services



RESPONSIBILITIES OF DIETICS:

- Patient food services.
- Nutritional assessment with the help of biomarkers.
- Diet counselling and planning.
- Provide services floor wise.
- Patient references are considered by dietician for diet counselling.
- Dieticians take regular rounds of all wards between 10am-12pm
- Patient references are put in wards will be seen by the dietician and proper diet is been prescribed.
- Out patients can visit dietician's office between 12pm-5pm for respective diet counselling.
- Any special patients with therapeutic instructions are passed on to supervisors who are responsible for food production and distribution.
- Particular nutrient restricted diet is prescribed depending upon the individual case e.g. for diabetics –potatoes, carrot, beetroot and glucose restricted diet is prescribed and for for hypertensive patient sodium restricted diet is prescribed, for thyroid patients iodine restricted diet is prescribed.
- For international patients, continental food is also prepared as they are not used to Indian food. With this nutritional supplements are also given to provide them proper nutrition

MANPOWER: 70 personnel are working in this department including 18 personnel in cafeteria.

BUDGET: For the financial year 2013-2014 is Rs 3 crores.

SURFACE AREA: The department is spread over 3000 sq ft both in ground and 1st floor each. In ground floor, there is kitchen where the food is prepared and is served floor wise. The chapattis are outsourced. For this, TMC provides space, raw material and hired women to make chapattis.

In 1st floor, there is cafeteria especially for TMC staff and there is one VIP dining area for all staff members above consultant level and for any parties of that level. For parties, some special dishes are prepared according to the menu.

PATIENT INFORMATION BOOKLET

Patient Information Booklet is a small booklet which gives information about the hospital to the patient. The information given is not the detailed information of the hospital but is sufficient for the customers. It help customers to locate the departments and to know procedures involved in registration, billing, OPD days & hours, Visiting hours of attendants etc.

Pictograms are incorporated in this booklet to help those who cannot read. With this, it is easy for them to understand and guide them to locate the place where they exactly have to go. Moreover, it is helpful for them to know all the procedures involved and the functions of the hospital.

BEING PAPERLESS

“Patient care, charting, dissemination of test results and treatments, and process from admission to discharge and follow-up are facilitated through the use of electronic information systems”

Versweyveld, 2005

Paperless hospitals will soon become the order of the decade. ‘Computer on wheels’ (Cows) is evolving as the next-generation technique for the conventional healthcare sector. Hospitals are slowly accepting the cloud concept and adopting the new technologies to become paperless, primarily for three reasons

1. Patient safety
2. Cost effectiveness
3. Better return on investment

The Tata Memorial Hospital (TMH) was established by the Sir Dorabji Tata Trust on February 28th, 1941 as a centre with enduring value and a mission for concern for the Indian people. Since then, the hospital is working on papers in every aspect to provide quality care to patient. In January 1st, 2013, TMH has taken an initiative of “*Being Paperless*”.

With the development of technologies and change in treatment plan, medical care has become more complex. New information has overwhelmed physicians’ capacity to treat patient with the latest information, to cope up with this they are adapting the new technologies and are ready to do their work online.

WHY TO GO PAPERLESS

- To improve patient care
- To have an Integrated Online Information System
- To have better tools for Management
- To maximize commonality of equipment and Systems
- To have effective, economic, timely and managerial data processing.
- To support large medical group and future healthcare delivery models.
- Illegible handwriting will be vanished.

CHALLENGES ENCOUNTERED

- To provide training to caregivers and support staff so that they aren’t overwhelmed by the transition from paper to electronic records.
- To ensure the privacy of patients’ most personal medical information after it’s made available online.
- Need for the electronic records software to be compatible.

SOFTWARES DESIGNED FOR DIFFERENT DEPARTMENTS

Software is defined as:

- Anything that can be stored electronically
- Allows users to complete specific tasks
- Applications to facilitate specific functions

TMH embarked as a pioneering medical care services which use Information Technology for its hospital through a system known as Hospital Management Information System (HMIS). HMIS was started in 1995 with the ND500 supermini computer connected to 40 dump terminals across the hospital. The system has been the vision of the Hospital Management under the guidance of Department of Atomic Energy with support of well trained and dedicated staff of User Department and Electronics Corporation of India Ltd.

With the support of engineers, administrative staff, technical staff and others the IT department developed the software for individual department considering their requirements. Following are the software used in the hospital:

1. Central Information System (CIS):
2. Diagnostic Information System (DIS)
3. Operation Theatre Module (OTM)
4. Radiotherapy Treatment Planning System (RTPS)
5. Blood Bank
6. Library Information System (LIS)
7. Electronic Medical Record (EMR)
 - I. Radiation Oncology Information System (ROIS)
 - II. Medical Oncology Information System (MOIS)
 - III. ICU Information System (ICUIS)
 - IV. Nursing Information System (NIS)
8. Electronic Financial Record (EFR)

ADVANTAGES

- Easier access to information
- Patient record is maintained
- Better coordinated prescriptions
- Less time consuming
- Moving towards “GO GREEN”: use of paper is limited
- Adapting new technologies
- Prevention of errors
- Improved communication
- Proper monitoring
- Better patient care

- More reliability

DISADVANTAGES

- Virus attack
- Internet slow
 - Unable to open reports
 - Delay in treatment planning
- Backup failure
- Diversity of software in various departments creates inability of different systems to communicate with one another.
- Password hacking

REVIEW OF LITERATURE

1. A national survey by the US-based Mayo Clinic says that most medical residents spend as many as six hours a day documenting and only a tiny portion seeing actual patients.
2. **Alec Barton, Ruckus Wireless Brings Paperless Hospitals in India:** Seven Hills Health City near Mumbai is now India's first paperless hospital. With the Ruckus Zone Flex system in place, Seven Hills Health City will be able to automate routine data collection to reduce errors and dependency on paperwork as well as instantly capture real-time patient data, test results, medical records and other life-critical information to accelerate patient evaluation and improve diagnostic accuracy.
3. **Going paperless: EHRs offer challenges, benefits, HemOnc Today, August 10, 2010:** The physicians who had converted to EHRs tended to be pleased after making the switch — 93% of those with fully functional systems reported being satisfied with their EHRs and 88% of those with basic systems reported the same. Most said the system improved timely access to medical records (97%); prescription refills (95%); communication with other providers (92%) and patients (72%); avoidance of medication errors (86%); and the quality of clinical decisions (82%). Additionally, 82% to 85% reported a positive effect on the delivery of long-term and preventive care.
4. **New South Wales:** In May, 2009, all the electronic system failed in the hospitals and lives were placed in danger. Doctors and nurses were frustrated by the disruption. Most states and territories are in the process of ditching the paper in hospitals in favour of the keyboard, with New South Wales expecting all medical records to be fully electronic by the end of next year. But a trial of the system in Western Sydney went awry on the weekend when the computers failed, and so did the backup.
5. **'Paperless' Hospitals Are Better for Patients:** Results from a large-scale Johns Hopkins study of more than 40 hospitals and 160,000 patients show that when health information technologies replace paper forms and handwritten notes, both hospitals and patients benefit strongly.

OBJECTIVES

General Objective:

- To know the extent of use of paper

Specific Objective:

- To describe paperless hospital
- To access the extend
- To know whether the staff is satisfied or not
- To know the level of satisfaction among patients

METHODOLOGY

- Study Design : Descriptive Study
- Sampling technique : Random sampling
- Area of Study : TATA Memorial Hospital
- Selection of respondents: It included
 - Head of Departments
 - Administrative Employees
 - Medical Secretaries
- Tools and Technique:

Face-to-face Interview: It is done with the help of a questionnaire to both staff and patients

QUESTIONNAIRE: For Staff:

1. Is the department working paperless?
 - a. Completely paperless
 - b. Partially paperless
 - c. On paper
2. Which are the documents you are maintaining on screen?
3. Which are the documents you are maintaining on papers?
4. Are you satisfied while working on screen?
 - a. Yes
 - b. No

For Patients:

- Are you satisfied with on screen documentation system?
 - a. Yes
 - b. No
- Would you like to keep your medical documents along with you?
 - a. Yes
 - b. No
- Why do you want to keep medical documents along with you?
 - a. Second Consultation
 - b. This is our right
 - c. Insurance Claim

RESULTS

Staff's View

- We had visited 33 departments. Among those, three departments were completely paperless, twenty-six were partial paperless and four departments were on-papers.
- 95% of the staff were satisfied with the computerization and were favouring while rest of the staff were satisfied working on-papers.
- To know the extent: See Annexure Table No. 1

Patient's View

Almost 95% of the customers/patients were satisfied with the hospital policy of keeping their medical records with them. They had no problems in that as the hospital is providing photostat of all the necessary documents to their customers, if required. And moreover they feel that if the documents are with the hospital then they are safe and there are no chances of misplacing or missing as they come from faraway places.

QUEUING IN GENERAL OPD (GJB)

ORIGINATION OF OPD

It was originated in mid 17th century by Sir George Clark in Hotel Die in Paris where 6 physicians were detailed for regular session on Wednesday or Saturday advising poor individually, in turn which introduced the idea of OP clinic. Modern OPD services were emerged in 1850 in USA from frame work of dispensaries where general practitioner, physician, specialist opinion, institutional Care V/s Domiciliary Care were given.

OPD (Outpatient Department)

It is defined as the section of the hospital, with allotted physical facilities, regularly scheduled hours and personnel in adequate numbers who are assigned for specific tasks to provide care to patients who are not registered as in- patients while receiving healthcare services.

Out patient: Any person given general or emergency, diagnostic, therapeutic or preventive health care and who at that time is not registered as an in-patient in the hospital is considered as outpatient.

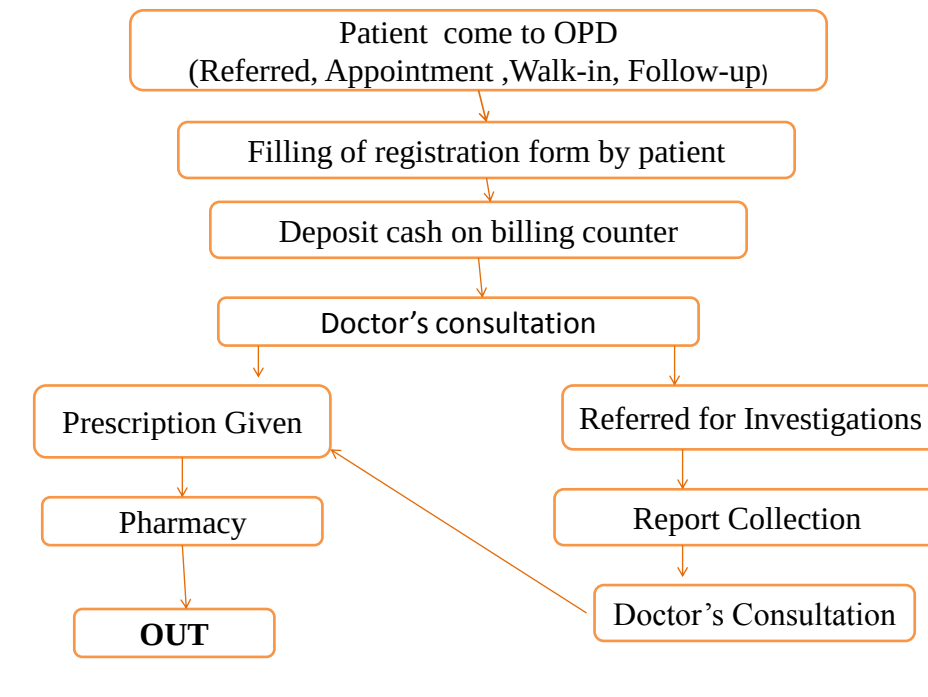
Two types of OPD Services

1. Centralized Outpatient Services: All services are provided in a compact area which includes all diagnostic and therapeutic facilities being provided within the vicinity of main hospital.
2. Decentralized Outpatient Services: All the OPD services are provided at a distance area away from the main hospital. It means the OPD services are not in the vicinity of main hospital. A single hospital may have 2-3 or more than that decentralised OPD services.

Types of Outpatient

1. General outpatient: All the patients other than emergencies who report directly to the OPD.
2. Emergency outpatient: Person given emergency medical care for condition which is real or perceived emergency.
3. Referred outpatient: A person referred to an OPD by his attending medical/dental practitioner for specific diagnostic procedure.

FLOW OF PATIENTS IN OPD



IMPORTANCE OF OPD SERVICES

- It is the shop window of hospital
- First point of contact
- Marks the hospital image
- A good OPD service can reduce the load on in-patient services
- It is a place for implementing preventive & promotive health activities.
- Facilitates teaching
- About twice the in-patients attend OPD every day
- Early diagnosis, curative, preventive
- Rehabilitative care on ambulatory basis
- Effective treatment on ambulatory basis
- Screening for admission to hospital
- Follow up care & care after discharge
- Promotion of health by health education
- Rendering of preventive health care

FUNCTIONS

- Training of medical / nursing students
- Maintenance of upto date records for future treatment
- Medical education
- Epidemiological & social research

PLANNING CONSIDERATIONS

- Location
- Separate entrance
- Easily accessible
- Should have approach from main road
- Adjacent to supportive facilities, x-ray & laboratory
- Amenable for Expansion
- Staffing: Staffing depends upon objectives of department and volume of work load.
 - Ancillary staff in OPD e.g. X-Ray, EEG & ECG technicians.
 - Clerical staff to carry out registration patient billing, cashiering etc.
 - In teaching hospital interns and residents assisting physicians.
 - Receptionist & other volunteer staff
 - Availability of Administrator for planning, organizing, supervising, evaluating, coordinating and improving outpatient services.

PRINCIPLES OF PLANNING LAYOUT

- Patient flow: It should move in one direction to avoid undue back traffic. Sharing with the IPD, All Diagnostic facilities, such as X-Ray & pathology laboratory should be amenable for expansion without serious dislocation of work.
- Layout:
 - Double loaded
 - Single corridor
 - Triple corridor which provides two rooms of examination treatment rooms on each side of a staff corridor.
- Size of OPD
- Type & number of specialist clinics
- Timings of OPD
- Number of daily OPD patients
- Number of attendants accompanying the patient
- Availability of space
- Plans for future expansion

SOME RECOMMENDATIONS ACCORDING TO BIS (BUREAU OF INDIAN STANDARDS)

- Entrance Zone: 2sq.meter/bed.
- Ambulatory Zone: 10sq.meter/bed.
- Diagnostic Zone: 6sq.meter/bed.
- Total hospital area: 60sq.meter/bed.
- Physical facilities: It is categorized into 4 groups:
 - Public Areas (Entrance zone): Should be easily accessible, with wide door and have ramps and steps
 - Clinical Areas (Ambulatory zone and Diagnostic zone):
 - Administrative Areas

- Circulation Areas
- Reception and Information:: A desk or a counter located within the public area.
- Registration and Records Area:
 - Should be located near the entrance
 - 100 cm high and with work surface, 60 cm wide and with file drawers.
 - One desk for 20 patients/hours.
 - 2 square meters per bed for OP records.
- Waiting Area:
 - Main waiting area should be adjacent to registration area
 - Sub-waiting area in each clinical department: It should be 1/3rd of the total patients visiting per day.
 - Area- 4 sq meter with min. of 0.1 sq meter/patient
- Consultation room:
 - Space for doctor's chair
 - patient's stool
 - follower seat
 - wash basin
 - examination couch
 - Equipment for examination
 - X-Ray view box
 - Area: 15-17 sq meter
 - Each clinician should handle 100 cases/day
- Special examination room: Required in certain departments.

ANCILLARY FACILITY

- Injection room:
 - Waiting area for 10-20 patients with 0.6-0.8 sq meter space/patient. Area may vary from 12 to 40 sq meter depend on work load.
- Treatment & dressing room: About 12-16 sq meter.
- Pharmacy: It should accommodate 5% of total clinical visits to OPD in one session
- Health Education Facilities: Min. area required is 15sq.meter.
- Medical Social Service Facilities

WORK LOAD

The number of patients visiting OPD depends on many factors

- Location of hospital
- Community needs
- Programme & resources
- Season of the year
- Transport & Communication

THUMB RULE: 4 patients for every bed. Each day about 40% new & 60% old

OBJECTIVE

- To identify the root cause of crowding.

METHODOLOGY

- Study Design : Observational Study
- Area of Study : General OPD, GJB, TATA Memorial Hospital
- Tools and Technique: Observation

PROBLEMS IN OPD

- Patients overcrowding
- Long waiting time

PROBABLE REASONS

- Wrong planning of departments
- Restricted registration time
- Shortage of staff

SUGGESTIONS

To overcome the problem of overcrowding Queuing Theory should be applied.

Queuing Theory: “To study the phenomena of standing, waiting, and serving” given by Klein Rock.

Characteristics of queuing systems

- Arrival Process: The distribution that determines how the task arrives in the system.
- Service Process: The distribution that determines the task processing time.
- Number of Servers: Total number of servers available to process the tasks.

PREVALENT SYSTEM IN OPD

- Consultation chamber no: 1, 2, 3, 4, 5
- Patients 1-8, 9-17, 18-26, 27-35, 36-43
- Patients allotted as per arrival
- Modified System in OPD: The queuing technique can be applied in various Patient areas-OPD, Radio diagnosis, Imaging, Operations (surgery) etc

We can prove using queuing theory that: Output improves when queues are used instead of separate lines.

OTHER RECOMMENDATIONS TO IMPROVE OPD QUEUING

- Railway counter should be separated
- CRO consultant OPD should be separated
- Queuing theory should be followed
- Entry and exit should be different
- Dispensary should be placed near the exit
- Proper ventilation
- Sitting arrangement should be more appropriate
- Dustbins should be covered to maintain hygiene
- Floor cleaning should be proper

FEEDBACK ANALYSIS

Feedback is a process in which information about the past or the present influences the same phenomenon in the present or future. As part of a chain of cause and effect that forms a circuit or loop, the event is said to "*feedback*" into itself.

Patient's feedback: It is defined as the patient's opinions, appreciation, and criticism about the services offered by the hospital in all terms.

TYPES OF FEEDBACK

Depending upon the patient's view feedback can be broadly divided into two parts:

1. Positive feedback
2. Negative feedback

Positive feedback: It signifies the appreciation by and satisfaction of the patients in terms of overall services received by the patient or his relatives in hospital.

Negative feedback: It signifies the criticism by and dissatisfaction of the patients in terms of overall services received by the patient or his relatives in hospital.

Depending upon the type of analysis feedback is divided into two parts:

1. Quantitative Feedback
2. Qualitative Feedback

Quantitative feedback tells us how much and how many.

Qualitative feedback tells us how good, bad or indifferent.

IMPORTANCE OF FEEDBACK:

Feedback is important as it tells how well you are doing in the eyes of the people who are important to you (e.g. your customers/patients or staff).

BARRIERS IN GATHERING FEEDBACK

- First of all, it is very common that fear gets in the way.
- Secondly, is a lack of engagement from staff and customers for example, they may feel they are simply too busy maintaining the status quo to take on board something new.
- Thirdly, a lack of actions reduces the effectiveness of gathering any feedback.
- Lastly, a lack of understanding how to go about it: how to make feedback work in practice.

OVERCOMING BARRIERS

- Let's look at fear. Nobody likes to hear bad news but knowing helps to know what you need to improve. Particularly comments, these clearly guide you to the actions.

- Secondly, feedback is often positive: it helps to understand and reinforce what you are doing right.
- Accountability is often a problem too. Someone in the organization needs to be tasked with listening to what is said and being accountable to doing something with it.
- Engaging staff and customers is not that difficult. If staff see feedback acts as a tool to help improve and learn what's going well, staff naturally will be more engaged to encourage more feedback.
- Customers may see your organization as a 'black hole' so responding to the request for feedback may fall on deaf ears. Overcoming this lack of engagement can be achieved by telling customers who receives their feedback, what happens with it, and some practical steps to acknowledge and respond to them as soon as you can.
- Lastly, lack of actions. If feedback can be delivered in real time it is useful 'fresh' insight which naturally leads to the actions required. e.g. passing on praise, fixing a problem, looking into an idea. Equipped with insight, staff has some choices to make, so by looking at these choices creates a healthier environment to take the appropriate actions. Of course, recording these actions is good to demonstrate things are happening.

FEEDBACK FORM OF TATA MEMORIAL HOSPITAL

It consists of seven questions: See in Annexure Table No 2

OBJECTIVE

- To analyze the patient satisfaction regarding the services offered by the hospital
- To provide suggestions and recommendation for improving the services

METHODOLOGY

- Study Design : Quantitative Study
- Sample Size: 100 feedback forms
- Area of Study : TATA Memorial Hospital
- Tools and Technique:
 - Feedback form of TMH
 - Data interpretation and analysis

RESULTS

As the figures are confidential, we are bound to share the results.

INFECTION CONTROL IN OPERATION THEATRE

(Dr Roopali Sawhney)

Infection control is the discipline concerned with preventing nosocomial or healthcare-associated infection, a practical (rather than academic) sub-discipline of epidemiology. It is an essential, though often under recognized and under supported, part of the infrastructure of health care. Infection control addresses factors related to the spread of infections within the health-care setting whether

- patient-to-patient
- patients to staff
- staff to patients
- among-staff

It includes prevention through

- hand hygiene/hand washing
- cleaning
- disinfection
- sterilization
- vaccination
- surveillance

Further, it monitors/investigates the demonstrated or suspected spread of infection within a particular health-care setting (surveillance and outbreak investigation), and management (interruption of outbreaks).

The introduction of antisepsis by Joseph Lister in 1960s changed the science of surgery from an activity of infection and death, to one that relieved suffering and prolonged life. Advances in aseptic practices, however, failed to have substantial impact on the rates of surgical site infection worldwide, and they remain a serious cause of morbidity and mortality in surgical patients.

INFECTION CONTROL IN OPERATION THEATRE

Tata Memorial Hospital is a super speciality hospital for cancer where near about 80% of the patients undergoes surgical procedures. That is why, proper infection prevention and control is necessary to ensure that patient who undergo surgical procedures within operating theatre receive safe and effective care. Furthermore, patients are exposed from inside and for longer duration which makes OT more necessary to be infection free area. Any infection during the surgery is hazardous.

OT is equipped with all the necessary equipments. Staff is adequate, both surgeons and nursing staff. As the hospital has pneumatic shoot system so in time of emergency testing of samples, the samples are directly sent to the concerned department for testing through

pneumatic shoot system. Between two surgical procedures minimum 15mins gap is given to sterile the OR for next procedure.

OTHER CHARACTERISTICS

- Number of OT's & location: TMH has three OT complexes, two major and one minor. The layout of all the OT's is near ideal and all have separate entry and exit of patient. It is located near the ICU.
- Pressure: Positive pressure is maintained inside the OT
- Humidity: 30-60%
- Temperature: 20-23 degree Celsius
- Air Changes: Laminar air flow is the system of air changes in TMH. In this, air passes through a bank of HEPA filters in a one way direction. The air flow may be vertical or horizontal. The delivery of air at a rate of 0.5 meters per second helps to inhibit the proliferation of microorganisms. They have been used in protective environments to reduce infections like Aspergillosis. Considering their high costs and limited benefits their role in operating rooms is questionable.

GUIDELINES SET BY THE HOSPITAL

KEY POINTS

- Theatre dress code
- Discipline
- Masks/caps
- Wearing theatre clothes outside theatre is prohibited
- Perform a risk management
- Recover patient in theatre
- Cleaning afterwards

CHARACTERISTICS

- Theatre Attire
 - Scrubbing
 - Caps/Masks
 - Jewellery
 - Scrub/Additional/Over gown
 - Shoes
 - Sterile gloves
 - Maintenance of staff & other personnel

- Patient Attire
 - Risk Management
 - Antimicrobial within 60mins prior to incision
 - Normothermia
 - Glucose control
 - Site Preparation
 - Site closure/dressing
- Ventilation
 - Air changes which dilute the pollutants
 - Anaesthetic gases
 - Smoke
- Preoperative Issue
 - Antiseptic showering
 - Hair removal
 - Patient skin preparation
 - Management of infected personnel
 - Antimicrobial prophylaxis
- Postoperative Issue
 - Incision Care
 - Discharge planning

FACTORS THAT INFLUENCE THE RISK OF SSI

- Patient
 - Age
 - Nutritional Status
 - Diabetes
 - Smoking
 - Obesity
 - Infection at a remote body site
 - Colonization with micro-organism
 - Altered immune response
 - Length of preoperative stay
- Operation
 - Duration
 - Skin antisepsis
 - Preoperative shaving
 - Preoperative skin preparation

- Antimicrobial prophylaxis
- OR ventilation
- Inadequate sterilization
- Foreign material in surgical site
- Surgical drains
- Surgical techniques
 - Poor haemostasis
 - Failure to obliterate dead space
 - Tissue trauma

OTHER PARAMETERS

➤ Positive Pressure

The air should be under positive pressure with the movement from clean to less clean area. This ensures that the dirty air does not mix with clean air inside the operating room. Keeping the room doors closed is therefore mandatory during all procedures. Controlling movement traffic is of paramount importance.

➤ Air changes

The minimum air changes per hour (ACH) in OR is 15 ACH i.e. the entire air in the room is replaced 15 times per hour and three air changes of fresh air. This is based on the assumption that occupants and their activities are responsible for most the contamination in the conditioned space. Peak efficiency for particle removal in the air space occurs between 12 to 15 ACH. The air should flow from the ceiling and be exhausted near the floor at least 6 inches above the ground.

➤ Temperature

The temperature of the operating room is 20-23 degree Celsius. This range is comfortable and also inhibits bacterial growth/multiplication.

➤ Humidity

The designated relative humidity for OR is 30 to 60 per cent. Levels greater than 60% besides being uncomfortable, promote fungal growth. The above standards are international recommendations. In developing countries without the necessary infrastructure, where in window air conditioner are often used, air quality cannot be guaranteed. It is also common practice to use fans “during the hot summer months”. Fans create air turbulence, lift dust and are not recommended in the operating room.

➤ OR cleaning: Instead fumigation, OR is cleaned fully on weekly basis.

➤ Chemicals Used:

- Scrubbing:
- Floor Cleaning: Hydrochloride & hydrogen peroxide
- OR equipment Cleaning: Damp dusting and then virkon is used

OBJECTIVES

- To identify whether the department is following the infection control procedures or not.

METHODOLOGY

- Study Design : Observational Study
- Sampling technique : Random sampling
- Area of Study : TATA Memorial Hospital
- Selection of respondents:
 - Sisters
 - Patients
 - Helpers
- Tools and Technique:
 - Observation
 - Face to face interaction

RESULTS

As all the personnel in the department are experienced and are well thorough with the infection control procedures. But still there are a few things which need to be corrected.

- ▶ Floor should be cleaned properly
- ▶ Sliding doors
- ▶ Use of masks should be compulsory for every personnel
- ▶ Verbal communication with open doors should be avoided
- ▶ Use of footwear from main OT area to OT no. 11 & 12 should be avoided as one has to pass from semi sterile zone.

A CASE STUDY ON PNEUMATIC TUBE SYSTEM

“High Speed Light Unit Load Transport”

India is one of the fastest growing economies in the World with growth rate between 6 - 8 per cent per annum. The Healthcare Industry in India is growing too at much higher rates at around 20 per cent per annum per year on yearly basis on an average. An estimate indicates that healthcare is spending 8 per cent of GDP and on an average estimated US\$ 1.5 billion is spent on medical equipments of which over 80 per cent is spent on high-tech medical equipments, devices and automation. The mass of healthcare professionals in India is unmatched by any other nation in the world. India is also one of the only few locations in the world with the latest in healthcare technologies including automation, surgical robotics, modular operating theatres, minimal access surgery systems, telemedicine, radiology etc.

ORIGINATOR

Pneumatic transportation was originally invented by Phineas Balk in 1806. Though a marvel of the time, and a successful sideshow, it was considered little more than a novelty until the invention of the capsule in 1886. The Victorians were the first to use capsule pipelines to transmit telegraph messages, or telegrams, to nearby buildings from telegraph stations.

The PRE-ANALYTICS AUTOMATION system streamlines the pre-analytical phase of work by automating centrifugation, destopping and aliquoting, bar coding, restopping, sorting and sample transfer because operators can load and leave them to be processed.

Pneumatic Tube System is the system in which cylindrical containers are propelled from one department to another department through compressed air via a network of tubes. Pneumatic tube networks gained great prominence in the late 19th and early 20th century for businesses or administrative purposes that needed to transport small but urgent packages such as mail or money, over relatively short distances within a building, or, at most, within a city. Some of these systems grew to great complexity, but they were eventually superseded by more modern methods of communication and courier transport, and are now much rarer than before. However, with the developing difficulties in hospitals for transporting samples and other objects like reports etc, it is widely used in hospital settings and will remain of great importance.

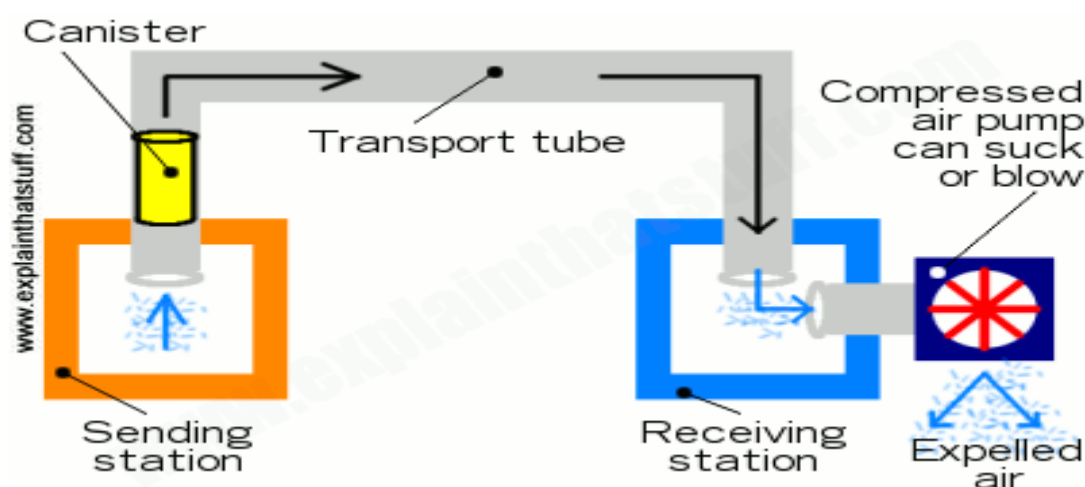
Pneumatic Tube Systems are installed in more than 3,000 hospitals as well as thousands in number in other industries.

COMPONENTS: It is composed of following parts

1. User stations
2. Carriers

3. Light Weight load transport system
4. Network of tubes that connects one department to another.

MECHANISM



Pneumatic tube systems-also known as pneumatic post systems are systems in which cylindrical containers called 'carriers' are propelled through a network of tubes by compressed air or by vacuum. Tubes connect various departments in a building. The objects are placed in an appropriately sized canister, which is tightly closed. Simple PTS follow conventional fluid mechanics principles. Air is blown down and/ or extracted from the pipeline, propelling the capsule along the pipe. Both ends of the pipeline are sealed during transport, allowing the air behind the canister to be above atmospheric pressure, and / or air in front to be below atmospheric pressure. The movement of the canisters can be tracked by computer interface. The system can be used to connect different buildings too. "PTS can be used between buildings by means of overhead tubing or underground tubing,"

REVIEW OF LITERATURE

1. **Article by K Deepalaxmi “Pneumatic Tube System”:** The days are numbered of staff running from one place to another within the hospital with samples or records. Pneumatic Tube Systems are here to take care of mobility of physical objects.
2. **Swiss log** is the leading world provider of pneumatic tube systems. Our pneumatic tube systems - also called air tube systems, enable fast and secure on-demand light material transport for the special needs of healthcare.
3. **Article by Chris Woodford “Pneumatic Tube Transport”:** A common solution many stores employ is to have a pneumatic tube system linking each checkout with the cashier's department, a strong room often located on a different floor of the building. Every time the checkout operator collects more than a certain amount of cash, they dispatch it securely to the cashier's department using the pneumatic tube.
4. **Pushpa Healthcare:** All medical facilities can be connected together: Central pharmacies, cafeterias, kitchens and administrative departments, labs and retail shops.

Paperwork, records, and even cash can be more efficiently routed to their intended destinations. Speedy, safe and soft transportation
Reduced speed for blood sample transportation
Secured transaction for safety sensitive goods
Statistical evaluation of all despatches as a standard allows for assignment of costs to different departments.
Critical samples and medications reach their destination in a short time
No spread of contaminated air through the tube system by means of HEPA-filters possible.
Increased efficiency for the internal logistic in a hospital

PROBLEMS: There are several risks and problems that entail human based transport. These are as follows

1. Delays/Time Consuming: Hospital's staff carrying the materials may get diverted to a corner for a quick cigarette or choose to have a quick cup of tea with his or her friends - not realizing the critical life saving time being wasted; non-availability of the staff at the time of need. Or sometimes may fall off and break which means the entire exercise has to be repeated. Moreover there are delays in providing reports.
2. Theft: A universal problem, invariably theft is very common during transportation of drugs, instruments and other materials, etc.
3. Exposure: There are many confidential and classified materials transported during a day in a hospital, which, are exposed to other unwanted personnel or people during human-transportation from one department to another.
4. Bio-Hazard: Carrying of sample (blood/tissue etc...) personally involves high risk of exposure to the carrier of the materials of other persons in the facility to infections and subsequent cross-infections....many more risks and problems.
5. Personnel: The Hospital needs to dedicate several staff members for just transporting and carrying samples and materials in the hospital - whereas they specifically hired for patient transportation, patient care etc... re-deputation of staff; over-hiring of staff, etc
6. Energy: Use of dumb waiters and elevators for running such errands cause high consumption of energy; adding to already high energy bills of the facility; apart from causing delays due to long waits at the elevator doors.

To overcome these problem pneumatic tube system has been installed in the hospital. It has shown positive results.

OBJECTIVE

- To reduce the chances of any kind of error
- To save time
- To generate reports on time..

BENIFITS OF PNEUMATIC TUBE SYSTEM

1. High speed

2. Time saving
3. Reliable air conditioned transport of delicate items like blood sample tubes.
4. Improved efficiency and productivity
5. Long distance transport between two departments in the same building and transport in two different buildings is possible and easy.
6. Less manual labor

CONCLUSION

Improvement is a never-ending process and has no limits, and this goes for any product or service not only PTS. PTS are a must in all government and private hospitals with a capacity of more than 300 beds. With the growing demand for and thus high cost of manpower, it is time to find an alternative. Pneumatic tubes systems, being a viable option, are sure to make a mark in most hospitals.

WORK PROCESS AND LICENSING OF BLOOD BANK

“Be a blood donor, all it costs is Little Love”

Blood Bank is one of the major departments in any hospital where donated blood is collected, processed and stored for further use. It will unable to run its own. Donors are the necessity of this department and that's too volunteer donors. A donor cannot be made forcefully. Only a persons' inner will to give live to others can help them truly. Mainly in cancer hospital it provides the supportive therapy. It does not form the main part of the treatment but without this sometimes it is impossible to treat patients. Moreover for cancer patient it is the necessity.

Blood bank means a place or organisation or unit or institution or other arrangements made by such organisation, unit or institution for carrying out all or any of the operations for collection, aphaeresis, storage, processing and distribution of blood drawn from donors and for preparation, storage and distribution of blood components.

HISTORY

It was establishment in 1915, when Richard Lewison of Mount Sinai Hospital in New York City initiated the use of sodium citrate as an anticoagulant. This discovery transformed the blood transfusion procedure from direct (vein-to-vein) to indirect. In the same year, Richard Weil demonstrated the feasibility of refrigerated storage of anti-coagulated blood. The introduction of a citrate-glucose solution by Francis Peyton Rous and JR Turner in 1917 permitted storage of blood in containers for several days, thus opening the way for the first "blood depot" established in Britain during World War I.

An important breakthrough came in 1939-40 when Karl Landsteiner, Alex Wiener, Philip Levine, and R.E. Stetson discovered the Rh blood group system, which was found to be the cause of the majority of transfusion reactions up to that time. Three years later, the introduction by J.F. Loutit and Patrick L. Mollison of acid-citrate-dextrose (ACD) solution, which reduces the volume of anticoagulant, permitted transfusions of greater volumes of blood and allowed longer term storage.

In 1950, Carl Walter and W.P. Murphy introduced the plastic bag for blood collection. It replaced the breakable glass bottles with durable plastic bags allowed for the evolution of a collection system capable of safe and easy preparation of multiple blood components from a single unit of Whole Blood.

In 1979, an anticoagulant preservative, CPDA-1 was introduced. It decreased wastage from expiration and facilitated resource sharing among blood banks. Newer solutions contain adenine.

TERMS RELATED TO BLOOD BANK:

- Blood: means and includes whole human blood, drawn from a donor and mixed with the anticoagulant.
- Blood component: means a drug prepared, obtained, derived or separated from a unit of blood drawn from the donor.
- Blood product: means a drug manufactured or obtained from pooled plasma of blood by fractionation, drawn from donors.
- Apheresis: means the process by which the blood is drawn from a donor, after separating plasma or platelets or leucocytes, is re-transfused –simultaneously into the said donor.
- Donor: means a person who voluntarily donates blood after he has been declared fit after a medical examination for donating blood, on fulfilling the criteria given hereinafter, without accepting in return any consideration in cash or kind from any source ,but does not include a professional or a paid donor.
- Professional donor: means a person who donates blood for a valuable consideration, in cash or kind, from any source, on behalf of the recipients-patient and includes a paid donor or a commercial donor.
- Replacement donor: means a donor who is a family friend or a relative of the patient-recipients.

BLOOD BANK OF TMH

Mission: Is to supply adequate quantity of safe blood and blood components to all patients in need.

The department provides the supportive therapy to the patients. It is located in the 5th & 6th floor of the service block. In the 6th floor, there is a donor area for blood donation and in 5th floor; blood bank is divided in several sections:

1. RCS Section: It is the receiving section of patients' & donors' samples for blood grouping and cross matching.
2. TTI Section: In this section, blood is tests for various infections such as HIV 1 & 2, Hep B & C, Syphilis, HCV, STD. To do this 3rd generation ELISA is done.
3. Component Area: Here, blood is processed and separated into different components: Following components are segregated:
 - I. Packed Red Blood Cells
 - II. Platelets
 - III. Plasma

After the blood is processed and separated into different components, then all the components are stored at the suitable temperature.

One can donate either whole blood or platelets. For blood donation, no tests are done earlier but for platelet donation, all the tests are done prior to donation. If the reports are positive then

the donor is rejected and counselled for further treatment, if asked to know the results. And if the results are negative then donor is accepted. All the tests are performed prior to donation during platelet donation because it is very lengthy procedure and expensive. It takes near about an hour to complete the cycle and costs about Rs 10,000/- per set which is disposable.

WORK PROCESSES OF THE BLOOD BANK

Three major processes are performed in blood bank:

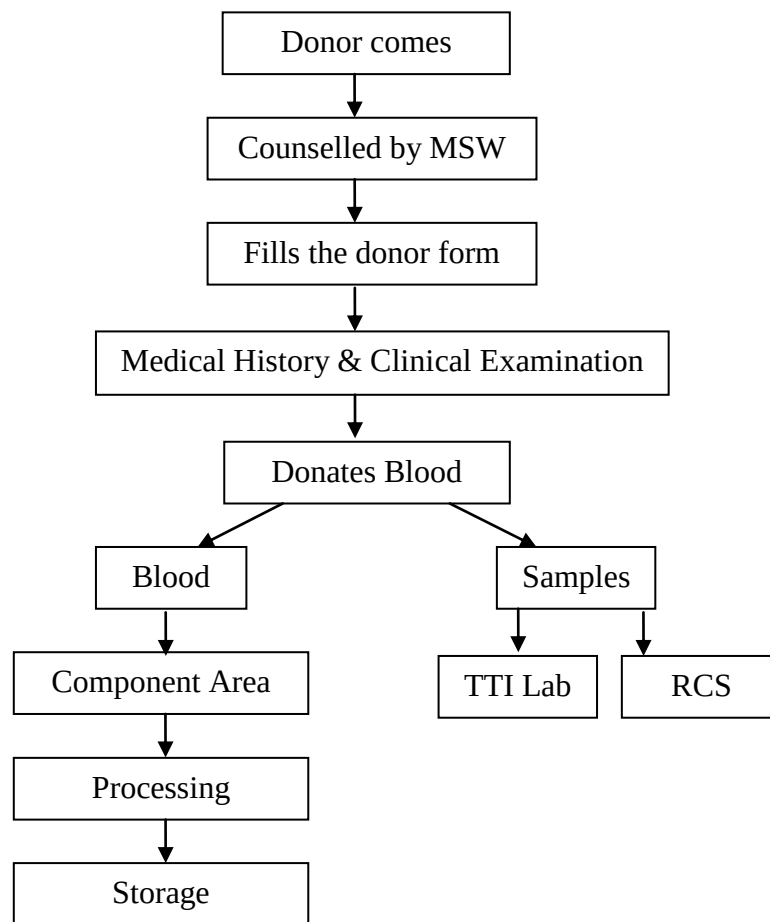
- Leucapheresis: means the process by which the blood drawn from a donor, after leucocytes concentrates have been separated, is re-transfused simultaneously into the said donor.
- Plasmapheresis: means the process by which the blood drawn from a donor, after has been separated, is re-transfused during the same sitting into the said donor
- Plateletpheresis: means the process by which the blood drawn from the donor, after platelet concentrates have been separated, is re-transfused simultaneously into the said donor.

STEPS INVOLVED IN BLOOD PROCESSING

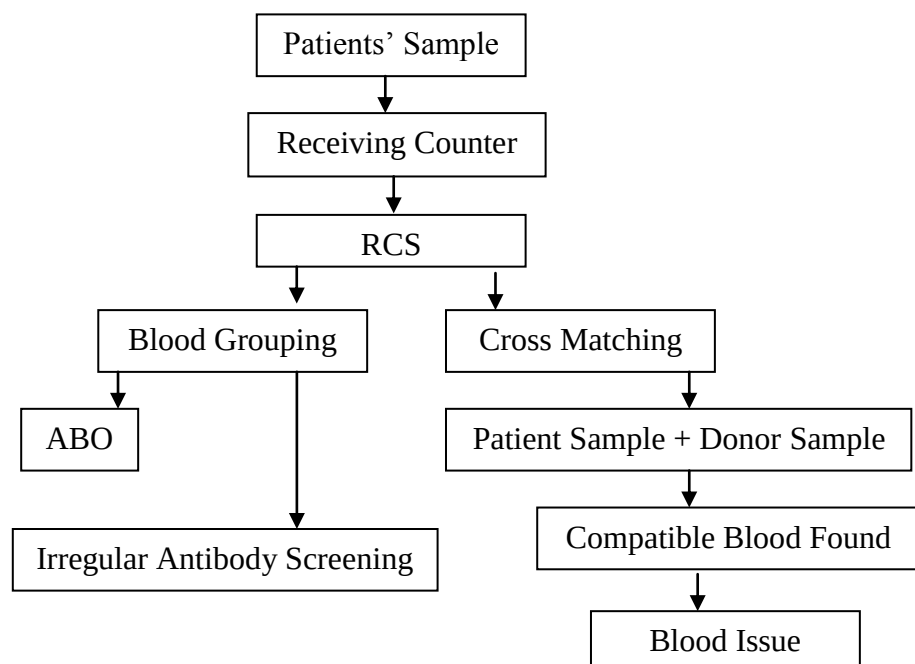
1. Collection of blood: It is donated by donors and the process is explained below under the heading “work flow of donor”
2. Collection of Sample: Samples are taken from both donors and patients. The flow of patient is explained below under the heading “work flow of patient”
3. Labelling: Each blood bag and sample tubes are labelled properly before undertaking any procedure. This is done avoid mixing of the samples and blood bags.
4. Testing & processing of blood into components: This is explained earlier in the sections of blood bank.
5. Storage of components: All the components have to be stored in different temperatures as per their requirements. After separation, plasma have to be snap freezed at -80°C and then stored at -35°C. All these components have different shelf lives and storage temperature which are given in the table below:

COMPONENTS	TEMPERATURE	SHELF LIFE
1. PCV	2-4°C	35days
2. Platelets	22-24°C	5days
3. Plasma	-35°C	1year

WORK FLOW OF THE DONOR



WORK FOLW OF PAIENTS



LICENSING OF THE BLOOD BANK

CONDITIONS FOR LICENSE:

1. The licensee shall neither collect blood from any professional donor or paid donor nor shall prepare blood components from the blood collected from such a donor.
2. The license and any certificate of renewal in force shall be displayed on the approved premises and the original shall be produced at the request of an inspector appointed under the drugs and cosmetic act 1940
3. Any change in the technical staff shall be forthwith reported to the licensing, authority and central license approving authority
4. The licensee shall inform the licensing approving in writing in the constitution of the firm operating under the license. where any change in the consultation of the firm takes place, the current licence .where any change in the constitution of the firm takes place, the current license shall be deemed to be valid for maximum period of three months from the date on which the change has taken place unless, in the meantime a fresh license has been taken from the licensing authority or approving authority in the name of the firm with the changed constitution.
5. The license shall not manufacture blood products from the blood drawn from any proffesnal donor or paid donor.

REQUIREMENTS FOR THE FUNCTIONING AND OPERATION OF A BLOOD BANK AND /OR FOR PREPARATION OF BLOOD COMPONENTS.

GENERAL:

LOCATION AND SURROUNDINGS: The blood bank shall be located at a place which shall be away from open sewage, drain, public lavatory or similar unhygienic surroundings

BUILDING: The building used for the operation of a blood bank and/or preparation of blood component shall be constructed in such manner so as to permit the operation of the blood bank and the preparation of blood components under hygienic conditions and shall avoid the entry of insects, rodents and files. It shall be

- well lighted & ventilated
- The walls and floor of the rooms where collection of the blood or the preparation of the blood components or blood products is carried out shall be smooth, washable and capable of being kept clean.
- Drains shall be of adequate size and where connected directly to a sewer shall be equipped with traps to prevent back siphon age.

ACCOMODATION FOR A BLOOD BANK: A blood bank shall have an area of 100 square meters for its operations and an additional area of 50 square meters for preparation of the blood components. It shall be consisting of room each for

- Registration and medical examination with adequate furniture and facilities for registration and selection of donors.
- Blood collection(air conditioned)
- Blood component preparation: this shall be air conditioned at 24-25degree Celsius.
- Laboratory for blood group serology
- Refreshment & rest room(air conditioned)
- Store & records

PERSONNEL: Every blood bank shall have following categories of whole time competent technical staff::

- Medical officer
- Blood bank technician
 - Degree in medical laboratory technology (MLT) with six months or one year experience
 - Registered nurses
 - Technical supervisor possessing with six months or one year experience

THE DEGREE OR DIPLOMA BEING FROM A UNIVERSITY /INSTITUTION
RECOGNISED BY THE CENTRAL GOVERNMENT OR THE STATE GOVERNMENT.

MAINTENANCE

The premises shall be maintained in a clean and proper manner to ensure adequate cleaning and maintenance of proper operations. The facilities shall include:

- Privacy and thorough examination of individuals to determine their suitability as donors.
- Collection of blood from donors with minimum risk of contamination or exposure to activities and equipments unrelated to blood collection.
- Storage of blood or blood components pending completion of tests.
- Provision for quarantine , storage, handling and disposal of products and reagents not suitable for use
- Storage of finished products prior to distribution or issue.
- Proper collection, processing, compatibility testing, storage and distribution of blood components to prevent contamination.

- Adequate and proper performance of all procedures relating to plasmapheresis, plateletpheresis and leucopheresis.
- Proper conduct of all packaging, labelling and other finishing operations.
- Provision for safe and sanitary disposal of:
 - Blood and blood components not suitable for use,
 - Trash and items used during the collection, processing and compatibility testing of blood and or blood components.

EQUIPMENT

Equipment used in the collection, processing, testing, storage and sale / distribution of blood and its components shall be maintained in a clean and proper manner and so placed as to facilitate cleaning and maintenance. The equipment shall be observed, standardised and calibrated on a regularly scheduled basis as described in the standard operating procedures .Manual and shall operate in the manner for which it was designed so as to ensure compliance with the official requirements (equipments)as stated below for blood and its components.

Equipments used:

- temperature recorder
- refrigerated centrifuge
- hematocrit centrifuge
- general lab centrifuge
- automated blood typing
- haemoglobin meter
- refraction meter or urinometer
- blood container weighing device
- water bath
- Rh view box
- autoclave
- serologic rotators
- laboratory thermometers
- electronic thermometers
- blood agitator

SUPPLIES AND REAGENTS

All supplies and reagents used in the collection ,processing, compatibility, testing, storage and distribution of blood and blood components shall be stored at proper temperature in a safe and hygienic place in a proper manner and in particular.

- All supplies coming in contact with blood and blood components intended for transfusion shall be sterile, pyrogen free and shall not interact with the product in such a manner as to have an adverse effect upon the safety, purity, potency or effectiveness of the product
- Supplies and reagents that do not bear an expiry date shall be stored in a manner that the oldest is used first
- Supplies and reagents shall be used in a manner consistent with instructions provided by the manufacturer.

GOOD MANUFACTURING PRACTISES (GMP)/STANDARD OPERATING PROCEDURES

Written standard operating procedures shall be maintained and shall include all steps to be followed in the collection, processing compatibility, processing, compatibility testing, storage and sale or distribution of blood components for homologous transfusion, antilogous transfusion and further manufacturing purpose. Such procedures shall be available to the personnel for use in the concerned areas. The standard operating procedures shall inter alia include:

Criteria used to determine donor suitability:

- Methods of performing donor qualifying tests and measurements including minimum and maximum values for a test or procedure when a factor in determining acceptability.
- Solutions and methods used to prepare the site of phlebotomy so as to give maximum assurance of a sterile container of blood.
- method of accurately relating the products to the donor
- Blood collection procedure, including in process precautions taken to measure accurately the quantity of blood drawn from the donor.
- Methods of components preparation including any time restrictions for specific steps in processing
- All tests and repeat tests performed on blood and blood components during processing
- Pre-transfusion testing, wherever applicable, including precautions to be taken to identify accurately the recipient's blood components during processing
- Procedures of managing adverse reactions in donor and recipients reactions
- Storage temperature and methods of controlling storage temperature for blood and its components and reagents
- Length of expiry dates, if any assigned for all final products
- Criteria for determining whether returned blood component from donor to its final disposal.
- Procedures used for relating a unit of blood or blood components from the donor to its final disposal.

- quality control procedures for supplies and reagents employed in blood collection ,processing and retransfusion testing.
- Schedules and procedures for equipments maintenance and calibrations
- Labelling procedures to safe guard its mix ups receipt, issue rejected and in hand.

CRITERIA FOR BLOOD DONATION:

CONDITIONS FOR DONATION OF BLOOD:

GENERAL:

No person shall donate blood and no blood bank shall draw blood from a person ,more than once in three months. The donor shall be in a good health, mentally alert and physically fit and shall not be inmates of jail, persons having multiple sex partners and drug addicts. The donors shall fulfil the following requirements, namely:

- The donor shall be in the age group of 18 to 60 years
- The donor shall not be less than 55 kilograms

EMERGENCY EQUIPMENTS /ITEMS:

- Oxygen cylinder with mask, gauge and pressure regulator.
- 5 percent glucose or normal saline
- Disposable sterile syringes and needles iv infusion sets various sizes
- Ampoules of adrenaline, noradrenalin, mephentine , dexamethasone injections
- Aspirin

ACCESSORIES:

- (1) Such as blankets ,emesis basins, haemostats ,set clamps, sponge forceps ,gauze dressing jars, solution jars , waste cans
- (2) Medium cotton balls 1.25 cm adhesive tapes
- (3) Denaturised spirit, tincture iodine, green soap or liquid soap.
- (4) Paper napkins or towels
- (5) Autoclave with temperature and pressure indicator
- (6) Incinerator
- (7) Stand by generator

LABORATORY EQUIPMENTS

Refrigerators for storing diagnostic kits and reagents, maintaining a temperature between 4 to 6 degree centigrade (plus / minus 2 degree centigrade) with digital dial thermometer having provision for continuous power supply.

- 1) Refrigerators for storing diagnostics kits and reagents maintaining a temperature between 4 to 6 degree centigrade with a digital dial thermometer having a provision for continuous power supply.
- 2) Compound microscopes with low and high power objectives.
- 3) Centrifuge Table Model
- 4) Water Bath: having range 37-56 degree centigrade
- 5) Rh viewing box n case of slide technique
- 6) Incubator with thermostatic control
- 7) Mechanical shakers for serological-tests for syphilis
- 8) Hand lens for observing tests conducted in tubes
- 9) Serological graduated pipettes of various sizes
- 10) Pipettes
- 11) Glass slides
- 12) Test tubes of various sizes/micrometre plates
- 13) Precipitating tubes 6mm*50mm of different sizes and glass beakers of different sizes.
- 14) Test tube racks for different specifications
- 15) Interval timer electric or spring wound
- 16) Equipment and materials for or cleaning glass wares adequately
- 17) Insulating containers for transporting blood , between 2 degrees centigrade temperature to wards and hospitals
- 18) Wash bottles
- 19) Filter papers
- 20) Dielectric tube sealer
- 21) Plain and edta vials
- 22) Chemical balance

23) Elisa reader with printer ,washer and micropipettes

SPECIAL REAGENTS:

- (1) Standard blood grouping sera anti A, AntiB AND ANTI D with known
- (2) Reagents for serological tests for syphilis and positive sera for controls
- (3) Anti human globulin serum
- (4) Bovine albumin 22 percent enzyme reagents for incomplete antibodies
- (5) ELISA or RPHA test kits for hepatitis and HIV1 AND 2
- (6) Detergent and other agents for cleaning laboratory glass wares

TESTING OF WHOLE BLOOD

- (1) It shall be responsibility of the licensee to ensure that the whole blood collected, processed, and supplied conforms to the standards laid down in the Indian government.
- (2) Freedom from HIV antibodies aids tests –every licensee shall get samples of every blood unit tested before use for freedom from hiv1 and hiv2 antibodies either from laboratories specified for a purpose by the central government or in his own laboratory .the results of such testing shall be recorded on the label of the container.
- (3) Each blood unit shall also be tested for freedom hepatitis b surface antigen VDRL and malaria parasite and results of testing shall testing shall be recorded on the label of the container.

GENERAL RECOMMENDATIONS

1. Wall clock in Homi Baba Block 1st floor
2. Patients lying on the pavement outside the Annexe building
3. Visitors visiting to ICU should be given masks & caps
4. All the non working equipments kept in one of the cubical of ICU should be shifted to the suitable place so that the area can be utilised for patients
5. Space should be increased for a few departments such as Occupational Therapy, Tissue Bank, MS office reception etc
6. CCTV should be installed
7. LCD should be in working condition in OPDs.
8. Dustbins should be covered to maintain hygiene.
9. Toilet in the Homi Baba Block should be properly cleaned and ventilated.
10. Observers' room with facility of lockers & toilet.

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ANNEXURE

TABLE NO 1

DEPARTMENTS	PAPERLESS	ON PAPER
CLINICAL		
1. Intensive care Unit	• Patient Details • Reports • Staff leave	• Daily Notes • Requisition • Consent
2. Operation Theatre	• Patient Details • Reports • Staff leave	• Staff entry record • Patient entry record • Consent • Requisition
3. Radiation Oncology	• Patient Details • Reports	• Consent • Requisition • Details of the procedure(dosage, duration etc)
4. Radio diagnosis	• Reports • Patient details	• Consent • Requisition
5. Day Care Centre	• Patient Details • Reports • Treatment Plan	• Patient entry register • Booking • Consent • Requisition
6. Dental Wing (General)	• Patient Details	• Consent • Patient entry • Requisition
7. Dental Wing (Private)	• Patient Details • Reports	• Requisition • Consent
8. Occupational Therapy		• On paper
9. Physiotherapy		• On paper
10. Palliative Care	• Patient Details • Registration • Follow up • Reports	• Consent • Requisition
11. Out Patient(General) Reception Area	• Patient Details • Reports	• Requisition • Consent • Treatment Plan • Print out and Xerox of patient file, when required
12. Out Patient (Private)	• Patient Details • Reports • Consent • Treatment Plan • Follow up	• Requisition • Print outs of patient file, when required

13. Inpatient	• Patient Detail • Treatment Plan	• Daily Notes
14. Psychiatry	• Paperless	
15. Transfusion Medicine	• Reports	• Requisition • Consent • Patient Details • Print out of reports
16. Sample Collection	• Patient details • Consent • Procedure	• Requisition
17. Dietary and Nutrition	• Vendors Detail • Stock Maintenance	• Diet Chart
18. Blood Bank	• Reporting of patient samples only	• Form • Consent • Donor's Profile • Reporting of both patient's and donor's samples • Maintenance of the records on register
ANCILLARY		
19. Central Sterile Supply Department		• On paper
20. Dispensary	• Prescription	• Requisition • Stock record
21. Linen and Laundry	• Indent • Demand order	• Bills • Staff Register
22. Tissue Bank	• Patient details • Reports • Staff leave	• Consent • Donors and recipients records
23. Medical Social Welfare	• Registration for travel concession and reservation	• Travel Concession slip • Reimbursement • BPL form • Senior citizen form • Widow form • Handicap form • Medical Claim
LABORATORIES		
24. Biochemistry	• Paperless	
25. Cytopathology	• Paperless except for the preservation of slides, register record	

	is maintained	
ADMINISTRATIVE		
26. MS office		• On paper
27. Medical Record Section	• Cancer Registry Software for maintaining patient records.	
28. Accounts and Finance	• Journal entry • Ledger • Balance sheet • Vendor record • Employees record • Pay order of employees • Salary slip • Online transactions	• Hard copy to patients for claims. • Refund
29. Academics	• Paperless	
30. Central Registration Office (General)	• Registration • Admission	• Consent • Requisition • Registration form
31. Central Registrations Office (Private)	• Registration • Consent • Admission	• Payment memo forms • Requisition • Print out of records, when required
32. Public Relation	• Reimbursement • Death claim	
33. Human Resource	• Recruitment • Employees details	• Recruitment • Performance Appraisal • Salary format • Appointment letter • Employee documents • Resignation letter • Voluntary retirement letter

TABLE NO 2

FEEDBACK ANALYSIS FORM				
1. How would you rate your communication with us?				
	Excellent	Good	Could be better	Bad
Doctors				
Nurses				
Auxiliary Staff				
2. Patient Amenities				
	Excellent	Good	Could be better	Bad
3. Medical Attention				
	Excellent	Good	Could be better	Bad
4. Overall, how would you rate your recent visit to TMH?				
	Excellent	Good	Could be better	Bad
5. Would you recommend TMH to your friends/relatives?				
	Strongly recommend	Recommend	Hesitate to recommend	Don't recommend
6. Would you like to recall your appreciation to any staff for outstanding care and service?				
Q7. Please share with us your suggestions/complaints/appreciation?				