



SATHYABAMA

INSTITUTE OF SCIENCE AND TECHNOLOGY
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SCHOOL OF BIO AND CHEMICAL ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING

UNIT – I – Hospital Management – SBMA3009

UNIT I - STANDARDS OF HOSPITALS

Introduction

Medicine began as an art and over a period evolved into a science.

Medicine in Ancient Times:

Medicine has evolved over a period in stages from Curative stage (treatment of diseases) – Present day – Preventive medicine.

Initially evolved from traditional cultures evolved from biological and natural sciences – Recently – Social and behavioural Sciences.

Primitive Medicine

- Due to limited knowledge
- Diseases were due to expression of God's wrath
- Invasion of body by evil spirits
- Bad influence of stars and planets
- Belief of ancient man in super natural theory the practice of medicine was based on prayers, rituals and sacrifices in any attempt to appease the gods.
- Driving out evil spirit by witch craft (or) black magic
- Medicine in prehistoric times (around 5000 BC steeped in religion, magic and witch craft.
- Supernatural theory of medicine still believed in areas of world. Eg. Concept of mantra treatment for snake bites in India depsoy – curse for one's past sins. Primitive man has disappeared from the planet but their progeny still exist in most part of the world.

Indian Medicine

Ayurveda and Siddha System

Ayurveda means - knowledge of life – derived from Atharva veda – one of the 4 vedas – Practice of medicine was associated with Mythological figures sages and seers – Ayurveda supported by Buddhist times – Susrutha sambitha – father of Indian surgery – Medicine,

pathology, anatomy, ophthalmology hygiene – Period b/w 800 BC and 600 AD was considered as Golden age of Indian Medicine – Moghul rule Ayurveda declined due to lack of state support.

Siddha System – Practiced mostly in Tamil speaking parts of South India.

Asoka established schools of medicine and public hospitals (226 BC) – Buddhist King (supported) Kanishk a Charaka – 500 drugs.

Chinese Medicine: Medical knowledge dating back at 2700 BC – Based on two principles Yang and Yin – immunization were available in Chinese system of Medicine – variolation to prevent Small Pox Acupuncture – Emphasis – hygiene, dietetics, massage and drugs.

Egyptian Medicine – dating back 2000 BC - Egyptian civilization oldest – art of picture writing – documented the happenings on papyrus – art of medicine was mingled with religion – medicine schools were existing in temple and physicians were equal to priests – no demonstration in anatomy – Preservation of human body – Zenith around 2800 BC – specialization was present in Egyptian times eye doctors head and tooth doctors paid by state – Egyptians excelled in – field of public health inoculation against small pox use of mosquito nets – Pride of place in world of medicine for 2500 years and was replaced by Greek Medicine.

Mesopotamian Medicine – is a part of Iraq cradle of civilization as long as 6000 years ago – Basic concept of medicine were religious – it was practiced by herb doctors, knife & spell doctors – medical astrology was written and this was written and this was flourishing in Eurasia – 2100 BC – flourishing oldest medical prescription available dating back to 2100 BC was from Mesopotamia, Babylonian code of Hammurabi contained codified laws relating to medical practice was the first such document in the world – Hammurabi – did not have scientific foundation.

Greek Medicine – 400 – 136 BC - Greeks taught people to think “How and Why” Aesculapius – leader of Greek Medicine – Medicine cure and Prevention were recognized – Greatest physician in Greek medicine.

Hippocrates - 460 - 370 BC (Father of Medicine) – introduced application of clinical methods in medicine – Epidemiology into practice of medicine – rejected supernatural theory of diseases and gave new direction to the medical though replaced by Roman civilization – separated medicine from magic and raised it to the status of science.

Roman Medicine – Roman borrowed medicine from Greeks – Practical Minded than Greeks – they had a keen sense of sanitation – Galen (130 – 205 AD) – outstanding medical teacher. He contributed field of Anatomy & Physiology ideas accepted world wide. He reported 3 factors predisposing exciting and environmental factors, it the cause of the disease.

Middle ages – Period b/w 500 – 1500 AD – with the fall of the roman empire – medical schools established in roman times also have disappeared – to progress was possible in the field of medicine – this period is called the Dark Ages of Medicines – Arabs translated Graeco – Roman Medical literature into Arabic and preserved ancient knowledge – development own system of medicine “Unani Medicine” – developed field of pharmacology

– Golden age of Arabic medicine was b/w 800 – 1300AD – during middle ages – Christianity lead to the establishment of the hospitals – first hospital record in England was established at York in 937 AD – Hospitals progressed, a chain of hospitals was established from Persia – Spain – Separate departments – various disease separate world – men & women.

During Middle Age : Monasteries – headed by Saints – Men & Women from all occupations were admitted to provide active medical and nursing care and to preserve ancient knowledge.

Era of Scientific Medicine: [1453 – 1600 AD] – Fracastorius – droplets – Syphilis (sexual contact) – Public health

Modern Medicine – After 1900 medicine progressed rapidly towards specialization, as the infections were brought under control incidence of new diseases like cancer, diabetes, heart disease has increased – Dichotomy of medicine – curative & preventive branches was established

Primitive – modern medicine

Early days – hospitalization of patients to segregate them from society, custody of physician care taker

In 1950 – 1960s – Heath promotion – Immunization – Health education – Baby clinics – Marriage counselling – Physical, emotional social & vocational rehabilitation of the patients in well recognized.

Modern hospitals – In patients – Out patients.

Shifting from treatment of individual – community oriented approach – This will result in reduction in the number of people reporting sick to the hospitals – This will improve the health status of the society as a whole – Thus, the evolution of hospital services during various periods of developments history of medicine makes an interesting reading.

HOSPITAL MANAGEMENT

Hospital administered – Appointed from among, the professional staff of the hospital – Generally medical men – Position by virtue of then seniority

Function: Manage resources – material – money & time – conceive the mission & goal of the

hospital – formulate the policies and plan the strategies to implement the same – King pan in organization & major role in solving the problem – must be creative & innovative – advances in diagnostic & therapeutic procedures – improve the quality of patient care by initiate the change.

Hospital Administration must be: Able to look ahead and plan while managing the present situation – able to create and accept new ideas & implement – them for the benefit of the patients – prepared to take risks to get the new ideas and implemented – able to coordinate the activities of the hospital in a healthy atmosphere – must be able to organize & allocate fund & exercise control – Able to analyze, synthesise and integrate the diverse information available to him. – Able to act with a sense of equity, fairness & social justice in all the dealing within & outside the hospital – knowledgeable, possess adequate skills and experience – motivated and be able to motivate other to work for the common goal – able to review, evaluate & make adjustments as necessary.

REQUIREMENTS TO BE AN EFFECTIVE ADMINISTRATION

Understanding the situation

Objectives – Incharge of the institution – aware of the objectives of the institution – unique goals – must be able to assess what extent the objectives were achieved, whether they can be achieved (on) need modifications to suit the present situation – find weakness of objectives – objectives – known to the staff working in the institution. **People** – deal people working for the hospital – selected by him – some already working in hospital – transfer of staff (other institutions (on) migrated)

Service – Primary objective of the hospital is to provide service to suffering humanity – every effort – improve the patient care – fit into frame work of national health policy

Integrating & Coordinating – Administration able to visualize entire hospital as unit – demand of department to be rectified not concerned department – integrated vision – hospital should coordinate its activities with other hospital & health institutions around – hospital should also integrate national programs like National Malaria Eradication Program (NMEP) – National Tuberculosis control program – National Leprosy control program – National immunization program

Leading – Most important qualities a leader must possess are Honey & Integrity – Decision making – enthusiasm mastery over fear – constructive activity willingness to serve – self confidence – initiative.

Building a team – Staff should be encouraged to plan and execute their activities with team

spirit – different team – therapeutic – supportive team – diagnostic – team work & cooperation of the different classes of personnel, administrator should develop managerial skills & proper attitude – Able to judge basic needs of the different experts working in the hospital in relation to purchase of equipment on starting a new test & procedures – familiar with the procedures, processes, technique & methods administrator should involve himself in continuing medicine education, refreshing his knowledge which will help his professional growth.

Creativity – Is an important factor which determines the success of the hospital – creativity should be encouraged among the colleagues and they should be encouraged to come out with new ideas and be prepared to change the status quo.

RESPONSIBILITIES OF THE HOSPITAL ADMINISTRATOR

He administers & directs all the activities of the hospital and ensures the activities of the hospital to achieve the goals – Initiates step to maintain high standard – professional technical & supportive – coordinates the activities of various departments of the hospital – Liaison of hospitals with both government and non government agencies transmits, interprets & implements the rules & regulations of the institution among staff of various department – delegates responsibilities & authority to appropriate person of the hospital and establishes means of accountability from the people to whom the duties have assigned – acts as liaison b/w the governmental agencies & the hospital board – helps in formulation & implementation of policies – prepares annual reports of the activities of the hospital and presents that to the hospital governing body – discusses the impact of various steps initiated by the government on the hospital activities – provides for sound patient care practices by all the staff ensures efficient and effective utilization of the physical facilities – establishes a good financial structure and ensure effective utilization of the financial resources – prepares budget proposals for the financial year and present it to the higher body of governing body – maintenance of the buildings, ground & equipment determines staff requirement – regulates the selection, employment confirmation of employees sanction of leave – construction of new buildings & arranges for construction – purchase of new equipment & machinery & procure them to determines need of training programs & conduct them – maintain good public relation with outside agencies & public – provides research & professional enrichment of the staff implements the legal requirements.

Following staff will directly report to the administration – Medical superintendent, Assistant / Associate Administrators / Nursing superintendent / finance officer / Personnel manager – some duties of the administrators can be delegated to assistant administrator (or) medical superintendent.

HOSPITAL DESIGN

Introduction – Designing infrastructure facility of hospital in various department – qualified

staff – planning of the facility – architectural plan (early stage) – must not be failure leads to loss of 1% of total cost of the project – time spent – careful, detailed planning of the hospital (save money & time).

Data collection – before establishing a hospital – demographic data meteorological data disease pattern – geographic data vital statistics data existing medical care facilities – future development plans – utilization patterns of existing facilities –

Planning Tea – Formed to prepare the architect's brief for designing hospital which includes – Hospital admin/ Director / Superintendent – civil engineer – medical architect – local body representative.

Estimation of requirements

Before construction – Preliminary calculation about the requirements of hospital – area and population likely to be served by the hospital – hospital set up in a rural area – metropolis and densely populated easy it 10 difficult to be determined as other hospitals already exist – Ensures efficient and effective utilization of the physical facilities – establishes a good financial structure and ensures effective utilization of the financial resources – prepares budget proposals for the financial year and present it to the higher body eg. Governing body maintenance of the buildings, ground and equipment determines staff requirement – regulate the selection, employment confirmation of employees sanction of leave – construction of new buildings and arranges for construction purchase of new equipment and machinery and procure them – maintain good public relation with outside agencies and public – provides research and professional enrichment of the staff implements the legal requirement – following staff will directly report to the administration – medical superintendent Assistant / Associate administrators – Nursing Superintendent Finance Officer – Personnel Manager – Some duties of the administrator can be delegated to assistant administrator (or) medical superintendent volume of patient seeking medical care in each department like duration of each consultation is established the estimates of hospital requirement can be estimated.

Site selection – establishing a hospital is choosing location of the facility – Hospital should be located in area easily accessible to the community – travel time to reach – 30 mts – site – spacious enough (chance for future of the hospital with expansion) in demand for services

Location of the hospital – It is difficult to find a site for the hospital in a central area especially in urban areas – as the cost of the land is prohibitive – located in large fairly near the periphery of the non town should expand in future – hospital will be central to the residential area

Size – Plot ratio is the ratio of the total area of the building to the area of the site – a plot ratio is one if the built up area is equivalent to the site area – If the hospital is a two storey structure

half of the site will be occupied the building and remaining will be open area available for road, care park etc.

Hospital size	Land required
25 beds	5 acres
100 beds	15 acres
200 beds	25 acres
500 beds	50 acres
750 beds	80 acres
1000 beds	100 acres

Availability of Services

Site Selected – Provided with H₂O and electricity supplies – Provision for connection to a main sewerage to carry the hospital effluents H₂O @ 500 litres / patient day – sewage disposal @ 400 liters / patient day – garbage disposal @ 1 kg / patient day – Electricity @ 1 KW / patient day

Environment – Site of Hospital – Free from pollution (air & noise) eg. Industry and air fields – Insect vectors carries diseases – exposure to breeze – proper ventilation

Communication system – Adequate telephone like – internal telephone connections – radio paging – public address system – intercom system – communication between nurse and patients

Soil structure – Soil testing regarding suitability – sub soil H₂O – Geological faults (carried out by engineers).

Preparation of the Architect's brief – Architectural plan of various depart?

Preparation of detailed plans – Once basic plan is approved – working diagrams – cost estimate.

Administrative approval & award of contracts - construction proceeds as per the plan without any deviation

Provision of man power & services - Heavy equipments – furniture – lift – generators – stores – electricity – water supply – sewerage system (man for this service is recruited)

Commissioning of the hospital – Construction is near completion – rules and regulations framed – procedure manuals – registers, various requisition – report form – inaugurated by a VIP.

Elements of Hospital - Hospital divided into following areas

Patients area – includes OP, emergency, service department, inpatient department, both several and special – Supportive services – Radiology laboratory, pharmacy blood bank – Operation theatre – medical records – Ancillary services – Mortuary – laundry – dietary stores – water and electricity supply trolleys – Community services – staff quarters – canteen – shopping – parking area for vehicles ambulances.

Broad outlines for establishing departmental zones - Parts of hospital closely linked to the community must be located close to the main entrance of the hospital – of services – emergency – casualty services – Next in order of distance from the entrance should be a zone allotted to medical service departments – radiology – area beyond this is allocated for inpatient services (or) wards other areas utilized by patients in hospitals are: - housekeeping, laundry, kitchen etc (grouped together delivery vehicle can go easily) around service ward – residential accommodations for staff may be provided near by to the hospital to provide easy access – located close to o/p area – laboratory services.

Role of climatic conditions – In certain climates hospital buildings – heated in winter – cooled in summer – airconditioning of the buildings is more expensive than heating cooling cost is proportional to volume of building number volume of building is reduced by providing low ceilings and restricting size of room.

In hot climates – design stage to ensure maximum natural cooling – Hospital buildings should be light and open and planned so that even the lightest breeze can pass across the room at low level to cool the occupants – In hot and dry climate the night are cool and the aim is to protect the occupants from the heat during the day – so buildings must be massive with thick walls which absorb heat during the day and dissipate it during the night – Small windows – minimize radiations entering the room – in hot climates – natural ventilation restoring air conditioning in extreme condition – cold climate – sufficient ventilation during winter cause cooling of cold air from outside – artificial air – cause contamination – OT burns and other wards where wound exposed to air must be provided with a/c – provided with air hygiene.

Light & color – Hospital designed to get natural light through window – while designing the window – it is better to avoid very large area of glass – results discomfort due to over heating in summer and cooling in winter windows – provided with shading devices to avoid patient direct exposure to open spaces in tropical and temperature mode – artificial lighting in the hospitals by night have also how been established.

Colors - used internally on the walls, ceilings and floors of the hospital buildings – which

forms integral part of hospital design – decision is best left to architect – colour can make different between depressing and disquieting atmosphere and pleasant one – lighting is generally affected by color scheme – colour scheme decided along window design from international color notation – colors can be chosen.

Visual impact of the hospital – Hospital authorities also feel that a huge, gigantic hospital buildings is a wrong symbol for modern hospital – modern hospital wishes to highlight its links with the community and its human personal character rather than its power and glory as a temple of healing – hospital designed by architect must be uniformity, resulting in a building with a powerful and monumental look – different façade is choosed to each units it will result in building but appears irregular smaller and more human in scale.

HOSPITAL ENGINEERING – In developed countries as 33% of the cost of the infrastructure of the hospital goes to the mechanical engineering services like heating, verification electricity lifts and communications their help is needed in early stages to get rough estimates o demand for H₂O, power, fuel an sewerage – important role in selection of site planning developing communication system lift and ventilation on systems – Engineers are concerned not only with installation of facility but area also responsible for maintenance the same – no equipment should allowed to installed unless there is a guarantee for maintenance of the equipment – engineers advise the architect regarding the immediate and future space requirement.

HOSPITAL HYGIENE – Cross infection – hospital acquired infections – resistant to variety of antibiotics – lack of proper facilities of disposal of hospital wastes can lead to pollution – epidemic illness – carriers in hospital spread the infection – aseptic dispose of waste and infected material – sterilization of bowls and instruments at different places – adequate ventilation – incinerator – to deal with the hospital waste generated provided.

REFERENCE BOOKS

1. Dr. L.L. Rao, Hospital Management. Annamalai University Press
2. R. D. Lele, Computers in Medicine, Tata McGraw Hill, 2008

UNIT – 1**PART -- A**

S.No	Questions
1	Define the types of health care centers
2	Define Hospital management.
3	List out the functions of Hospital administrator.
4	What are the requirements to be effective administrator?
5	Enumerate the objectives to be an effective administrator.
6	Differentiate general hospital with specialty hospital.
7	Briefly explain the responsibilities of the hospital administrator.
8	What is master plan in Hospital designing?
9	What are the elements of hospital?
10	Define hospital design.

PART – B

1	Discuss the different functional areas of hospital management.
2	Explain the procedure for designing hospital departments.
3	Discuss the evolution of medicine and health services.
4	Explain the role and responsibilities of administrator.
5	“The quality of the service depends on the quality of management and leadership in an organization”. Discuss in relation to health care management.
6	Describe the outlines for establishing hospital zones.
7	Write short notes on Hospital engineering, hospital zoning and hospital hygiene.
8	Discuss in detail the steps involved in hospital designing.

UNIT – II – Hospital Management – SBMA3009

UNIT 2 HOSPITAL ORGANIZATION

Organization of Out – Patient Services

Outpatient services or ambulatory care is gaining importance, as it helps to reduce the dislocation of work. It is cheaper and at the same time provides various investigative and diagnostic facilities of the hospital. This department is the first point of contact between the patients and the relatives accompanying them. Efficient procedures in O.P.D. produce a favorable image among the public.

Objectives and Scope of O.P. Services

- a) To provide general medical services to patients both on scheduled and unscheduled basis.
- b) Family welfare services and counseling.
- c) Health education and
- d) Medical, paramedical and nursing education.

The Services Offered in the O.P.D. will include

Preventive and promotive services like immunization, screening, antenatal clinics well baby clinics etc.

Curative services which include consultation, investigations, therapeutic measures and specialty services.

Follow up of discharged patients, chronic diseases, post natal clinics etc.

Rehabilitative services like physiotherapy, occupational therapy, prosthetics and orthotics (provision of artificial limbs etc.).

Thus the O.P.D. services bring down the financial as well as workload of the hospital and contribute to the financial viability of the project.

Location of OPD Services

The outpatient department should be located near the main roads close to the hospital entrance and be easily accessible.

Adequate provision should be made for parking etc. and to prevent noise and dust pollution.

This should be separated from but connected with the in-patient wards and other departments.

Advantages of Separate O.P.D.

- Efficient
- Scheduling and
- Communications

The patients find it easy to find their way around. The patient and attendant traffic can be minimized in the main hospital area. The OPD can be kept locked when not in use. Expansion of the facility can be easily done as and when required.

Disadvantages of Separate O.P.D.

Some of the OP facilities may be needed by in-patients also.

Some of the specialized investigation facilities may be available only in respective specialty departments, thus causing inconvenience to the patients.

Duplication of certain services which can otherwise be shared by both OP and IP departments. e.g. Satellite laboratories.

Out Patient Department must be close to

- Medical records Division
- Diagnostic laboratories
- Radiology and Imaging Sciences department
- Pharmacy
- Casualty and emergency department

The outpatient departments of all specialties should preferably be in one building, so as to facilitate easy cross references between various specialties.

Physical Infra Structure and Facilities in O.P.D.

There are no universally acceptable standards for the design of O.P.D. The requirement varies with the size of the hospital and its bed strength.

The patient load in O.P.D. varies with the location of the hospital – (More number of patients visit the hospital situated in the center of the town/city), availability of health care services at other health care facilities in the nearby area, the type of services offered and the reputation of the hospital.

Generally, for every in-patient (or bed) in the hospital, 2 to 3 patients along with 2-3 attendants will be visiting the hospital. Therefore, for a 500-bed hospital, 2000-3000 people will be visiting the hospital on any given day.

Ancillary Facilities

Depending on the type and size of the hospital, the following ancillary facilities will be available:

General

- a) Medical records – Centralized – O.P. and I.P. records

Separate O.P. records

Decentralized – for each discipline.

- b) Clinical Laboratories – Centralized single sample collection area with attached bleeding facility and toilets.
- c) Radiology and Imaging Sciences Department with provision for X-ray and ultrasound.
- d) Pharmacy to dispense medicines.
- e) Physiotherapy and occupational therapy departments – Gymnasium, Facilities for hydrotherapy and heat therapy to assist in rehabilitation of patients as a part of treatment.

Specialized

Gastrointestinal endoscopy – sigmoidoscopy, colonoscopy, gastroscopy. Pulmonary function laboratory with provision to carry out spirometry and bronchoscopy. Neurological laboratory to carry out Electro-encephalography (E.E.G) and Electro- neuromyography (E.M.G)

Cardiac laboratory, Echocardiography, Computerized stress test treadmill.

Administrative and Supporting Facilities

The following constitute the administrative and supporting facilities:

- a) Office of O.P.D. in charge – Nursing Superintendent

Public relations officer or Enquiry Officer

Security officer

Medico-Social worker.

- b) Cash Counters
- c) Store room
- d) Toilets.

Problems Encountered in Functioning of Outpatient Department

Complaints of patients

Prolonged Waiting Time

This is most common complaint from the patients. This may be due to

- Too many patients in relation to doctors.
 - Doctors busy elsewhere during O.P. hours.
 - Doctors come late or away from O.P.D. for a longtime.
- 1) Delays in registration procedures, collection of laboratory specimens and payment due to
 - 2) Shortage of staff in respective areas.
 - 3) Due to non streamlining of procedures for efficiency.
 - 4) Non availability of consultant or delay in delivery or misplacement of laboratory results.
 - 5) Referral of patient to a wrong consultant by registration staff.
 - 6) Critical equipment and supplies shortage like Out of order X-ray units or E.C.G equipment.

Complaints Regarding the Quality of Service

Due to heavy workload, consultants can not spend sufficient time with the patient. Lack of undivided attention and consultation especially by senior doctors. Lack of privacy, especially in larger government hospitals. Consultations mostly by junior doctors and lack of clear advice. Too many investigations ordered, which require repeated visits to hospital.

Unfamiliarity with procedures to be followed to avail services like X-ray, laboratory investigations after the consultation and lack of proper guidance regarding the location of various departments and about procedures to be followed.

Multiple service points, instead of a single window concept, situated away from one another. Revisits to hospitals for cross reference due to non functioning of certain specialties on all days.

Lack of Amenities

In sufficient or unclean toilets. Lack of good transport facilities to reach the hospital. Lack of security, thefts. Erratic power supply and lack of generator back up to departments like radiology, laboratories, ophthalmology, ENT and other departments which need electricity for routine work. Absence of a female attendant during examination of a lady by doctor.

Complaints from Doctors

Heavy workload, each doctor looking after about 50 cases in the morning in a general hospital.

Lack of sufficient time to complete the in-patient rounds, especially post operative cases, prior to attending O.P. as the O.P. time coincide with time doctors report to study.

Excessive clerical work – filling of multiple forms, register, replying to referral letters and lack of secretarial help.

Non availability of Patient records or results of investigations. Doctors will have to liase with M.R.D and laboratories to obtain a duplicate report.

Medical Records Department

- a) Misplacement of records. Records not returned by consultants. Records wrongly filled. Non availability of reports. Records taken away by patient.
- b) Improper filling of records

Results in lack of continuity in patient care with a possible effect on the quality of record maintenance. Lack of standardized record format and disagreement about the quality and quantity of content.

Remedial Measures for Effective Functioning of O.P.D. reduce Overcrowding and Minimize Patient Waiting Time

This can be achieved by:

Screening of routine cases by general duty medical officers, thus reducing load on specialists and senior consultants.

Adopting consultation by appointment method – ‘block’ appointment or ‘individual’ appointments. In the former type, a certain number of patients will be required to be present for consultation, while in the latter method individual patient is given a particular time for

consultation. The 'block' appointment provides sufficient pool of patients, depending on the capacity of waiting area, and the clinician at any given time finds him idle.

Application of queuing theory modules of operations research to study the patient movement in different areas, by noting down the rate of patient arrival per hour, Service rate per hour and number of servers. By effecting changes in these parameters and in queue system the patient waiting time can be successfully be reduced to acceptable levels.

Organizing special clinics like diabetes clinic, well baby clinic, leprosy/TB clinic, super specialty clinics etc in the afternoon.

Extending the O.P.D hours or by running evening O.P.

Synchronize functioning of various ancillary facilities like laboratory, Radiology, Pharmacy etc, and also providing adequate staff during peak hours.

Redeployment of doctors and other staff from less busy areas to more busy areas, as and when the O.P. load increases. This should be built into the organizational set up for smooth functioning of the services.

Improve guidance of patients and facilitate easy understanding of hospital procedures and routines by providing.

Information graphics and signs system: Providing name boards, Pictorial depiction of services provided, direction signs, provision of color coding for different service areas, provision of different color lines on the walls to indicate the paths for different service areas. Provision of effective enquiry and reception services. Enlisting the help of hospital volunteers and guides.

Printing of the procedural instructions on the investigation slips both in vernacular and English language to facilitate better communication with the patients.

In-Patient Services

The very purpose of existence of the hospitals is to care for the sick and injured. Ward is the heart of the hospital. It houses the patients. Majority of the functions of the hospitals is carried out in the ward or dependent on the personnel manning the ward.

Ward Planning

The most important aspect of proper ward management begins with the planning of physical facilities. The nursing unit should be planned in such a way that it can be operated with lowest possible cost and at the same time achieve its functional goal.

The following are the functional goals of a nursing unit:

- Provision of highest possible medical care to the patient.

- Highest degree of job satisfaction to both medical and nursing professionals.
- The facilities to meet the needs of visitors and attendants of patients.
- The most desirable environment for the patient.

Size of the Nursing Unit

The ward may have 20 to 90 beds. The nursing unit should be neither too small nor too large.

Type of patients

The size of the nursing unit or ward varies with the type of patients it caters to. In case of intensive care units, burns unit, intensive coronary care units, recovery ward etc. where critical patients are kept should be of smaller size, so that adequate nursing care can be provided. In these wards, the nurse patient ratio is high. On the other hand, in chronic diseases ward, like psychiatry ward and tuberculosis ward, the number of beds may be more (even more than 50 beds).

Staff Requirement

The maximum activity in the ward takes place usually between 8 A.M and 12 noon. The activity is less during the rest of the day and night.

Position of the Head Nurse and the Ward Clerk

The head nurse and ward clerk are posted to take up the administrative responsibilities of the ward, thus allowing the staff nurses to devote most of their time for patient care. The head nurse also provides leadership and guidance. Thus, posting a head nurse in a unit, will go a long way in improving patient care, inter department relationships and effective materials management in the unit.

Components of the Ward

The wards consist of broadly the following areas:

- Patient housing area
- Ancillary area
- Sanitary areas
- Auxillary areas

Patients Housing Area

The usual practice in many general hospitals or government hospitals is to provide a dormitory type of accommodation in the wards where in number of beds are provided in a hall, with common sanitary facilities. This type of wards does not provide privacy to the patient and noise levels are likely to be high.

In view of this, the present day practice encourages provision of a few rooms with single beds, a few with two beds and majority with 4-6 beds in a bay. This arrangement provides adequate privacy and helps in reducing the noise levels.

The recommended size of the rooms for different categories of the wards is as follows:

- Room with single bed : 125 sq. ft.
- Two-bed room : 160 sq. ft.
- Four-bed room : 320 sq. ft.
- Six-bed room : 400 sq. ft.
- Intensive Care Unit (I.C.U.) : 120-150 sq. ft. per bed.
- Obstetrics and Gynecology : 120 sq. ft. per bed.
- Orthopedics : 120 sq. ft. per bed.

Ancillary Areas

Nursing station This is generally the head quarters of the nursing unit. It should be of adequate size and have ample storage space to hold stationary, records, report forms, charts etc., and to store medicines. This comprises of office area for sister-in-charge, work area for staff nurses with attached toilet facility.

Treatment work room Each nursing unit should be provided with a treatment room for physical examination, dressings and also to carry out certain procedures which can not be carried out at bed side in the ward.

Clean workroom This is workroom for staff nurses posted to the ward. This is provided with workbenches for preparation of trays, care of materials, equipment and instruments used in the ward. Adequate shelf and storage space should be provided in this area.

Pantry This area is used to wash, clean and store dishes in the ward. Adequate running water facility with sinks should be provided in this area.

Unit store One or two store rooms are needed in each ward for storage and safe custody of linen and other supplies.

Dining and day room It is desirable to provide a dining and day room for ambulatory patients in the ward which is preferably located at one side of the wing and provided with adequate seating facilities. This will help in recovery of patients.

Sanitary Areas

The optimum requirements are one bathroom or eight patients and one toilet for five patients. In addition to this, separate toilet facilities must be provided for male and female employees and visitors.

Dirty utility room A separate dirty utility room for washing bedpans, urinals and specimen bottles etc should be provided in each ward.

Store for sweepers Space for receptacles, hangers for brooms and mops, shelves for storing cleaning materials is needed.

Auxillary Areas

- Duty room for doctors
- Clinical side rooms
- Seminar room
- Attendant room
- Locker room for staff

Ward Design

The primary objective of a good ward design is to facilitate the staff nurse to hear or see anything happening in the ward with minimal physical or emotional stress.

Open Ward

This is an open hall where beds are placed in rows facing each other. The nursing station is located in the center. The ancillary service areas are located either in the center around the nursing station or at both sides of the hall.

Rigg's Ward

This type of open ward was first established at RIGG's hospital. Denmark and hence the name. In this design, three or four beds are placed in the bays, parallel to windows, separated from one another by low partitions.

Unilateral Rigg's Ward

Size beds are placed in each bay. The bays are separated from nurse's station with its standby services by a common corridor. In this design, the activities of doctors and nurses are limited to each bay only. However, noise levels could not be reduced in this type of ward and nurses do not have ample visibility. It is necessary to fix calling bells in patient's area.

Bilateral Ward

This type of ward is most suitable and workable proposition in hospitals where controlled environment and mechanized ventilation is not a problem. This is also called a double corridor ward. Here two unilateral RIGG's type wards are on located on either side of the central nursing station. The advantages in this type of ward are – It allows for optimum visibility and reduces walking distance for the nursing staff.

'T' Shaped Ward

The beds are placed in front of the nursing station. The most critical cases requiring maximum attention are placed nearest to the nursing station. On either side of nursing station, isolation bays are provided. Ancillary and other areas are placed behind the nursing station. Here, care should be taken to provide ventilation mechanically. Nurse-patient communication system also needs to be arranged.

The shape of the ward can be altered in any way like 'Y' shape, 'X' shape, circular or semi circular by suitably arranging the patient bays or cubicles and other service areas.

With the advent of central supplies systems, especially in hospitals in U.S.A., the design of in-patient accommodation has shown a dramatic change. The development of central supplies and food services has now made it possible to eliminate or significantly reduce the requirements of ancillary areas, which used to be a part of the old self-contained wards. For example, the linen storage area can be totally dispensed with while kitchen area can be reduced to a small service area.

The traditional ancillary rooms will not find place in a hospital planned with a full scale central supply and delivery system and are replaced by lifts and conveyors with sufficient parking space in the wards for trolleys on which supplies arrive and remain in the unit until they are removed for re-stocking.

The concept of the ward now comprises of accommodation for 40-60 patients, subdivided into a number of small units; each cared for by a nursing team. The floor is supplied by a central area to which lifts and conveyors deliver supplies from service departments and soiled material are removed by lifts.

This type of ward layout is known as FRIESEN "RACE-TRACK" WARD PLAN.

Ward Management

The person responsible for managing the ward is called “Head Nurse” or “Ward Sister”. She is responsible for:

Providing good medical care to the patients under her charge for 24 hours a day. Providing the medical care as per doctor’s instructions. Coordinating patient care activities with other departments of the hospital. Orientation of new staff posted to the ward under her supervision. Instructing the staff working under her. Supervision of the activities of personnel working under her supervision.

Casualty and Emergency Services

The casualty and emergency service, provides immediate, emergency diagnostic and therapeutic services to the patients. Unlike the routine out patient services, this department deals with.

Medico-legal cases like injuries by accidents, attempted suicide, homicide, accidents etc. and the medical officer has to follow certain formalities, which are mandatory and involve maintaining different types of records.

Sudden attacks of illness or exacerbation of the disease. These patients need immediate attention, resuscitation and life saving treatment. Here the service is to be rendered with speed and accuracy and the priority depends not on the time of arrival of the patient but on the seriousness of the case.

Objectives and Scope of Services

To provide immediate relief to patients coming to the hospital with acute medical and surgical emergencies like myocardial infarction, shock, snake bite, poisoning, status asthmaticus, acute abdomen etc.

Managing accident victims by providing first aid, treatment of minor injuries and referring the patient to concerned specialty department of the hospital or to another institution when facilities cannot be provided in this hospital.

To attend to all medico-legal formalities including documentation of clinical condition and other relevant data required by police and intimating the police of medico-legal cases treated at the hospital.

Attending the patients after the out patient hours and screening them for admission, observing the patient for a short time, before deciding about the need for admission, providing out patient care and advise the patient to attend concerned O.P. the next day.

The extent of provision of casualty services depends on the region. The requirements are different for industrialized and agricultural areas, between cities and villages, urban and rural areas. In cities and industrialized areas, accident cases are more while in rural areas

diseases of hearts, lungs and gastro-intestinal tract require attention.

Casualty and emergency services department should be located in close proximity to the entrance of the hospital, wards and other services departments. The medical officers posted here should have adequate knowledge about the various services available and the procedures of the hospital. This department should develop and maintain good relationship with medical institutions in the neighborhood like hospitals for trauma care, neurosurgery, burns and infectious diseases. Such rapport will make referrals to the hospitals easier.

The hospital must have a definite policy regarding the Casualty services. Periodical review and implementation of modifications, if required should be carried out at regular intervals. Staff should be informed of changes implemented immediately.

Organization of Casualty and Emergency Services

Location The casualty department should always be in front of the hospital. It should be easily identifiable. The patients and the vehicles should be able to approach it without difficulty. It is always preferable to avoid cross traffic to ensure smooth traffic flow.

The departments like radiology, laboratories and blood bank should be suitably located to be in close proximity to this wing and casualty patients should be given priority in provision of these facilities.

Accommodation The entrance to this area should be separate and wide. It should be used only by those attending the casualty department. It is advisable to provide separate entrance for patients brought in by ambulance. The following provisions should be made in the department:

Reception and Waiting The patients arriving by ambulances, other vehicles or walking has to be received and hence adequate space must be available. The entrance should be wide enough and must preferably be provided with sliding doors. Adequate area should be provided to maneuver the stretchers, trolleys and wheel chairs. Cross traffic should be avoided. The waiting area should be large and should provide a cheerful milieu.

Telephone facility must be provided for public in the waiting area of casualty department. Toilet facilities for the visiting public should be provided. Besides the reception desk, seats should be provided for the visitors.

The entire area must be provided with enough light and ventilation. The area should be connected to emergency power supply to ensure continuous functioning of the life saving equipment available in this department.

Clean, aesthetic signboards must be displayed prominently to provide guidance to the visiting lay public about the location of various services.

Examination Rooms Cubicles for examination and treatment (two to three each in a medium size hospital) of patients must be spacious enough to provide for easy movement. It is

better to separate clean cases from septic and infected cases.

A separate room may be provided for patients requiring isolation esp. cases like gastroenteritis, cholera etc. Adequate number of couches and other furniture like tables and chairs should be provided in this area.

Wash basins, towels, dust bins with covers for disposal of wastes should be provided. A room for casualty medical officers and a nursing station should also be provided.

Provision of atleast one minor operation theatres for emergency surgeries with ancillary rooms is necessary for the casualty department.

Beds for observation of patients must also be available in the casualty department and it is advisable to restrict such observation to only 24 hours. Decision about admission to the hospital or discharge should be made during that time.

Adequate toilet facilities, wash rooms, lockers for keeping personal belongings and change rooms must be provided separately for men and women staff members.

Store Room A separate storeroom should also be provided.

Asepsis The concept of avoiding sepsis and cross infection must always be given importance and measures should be instituted to minimize the possibility of spread of infections. The area should be washed or swabbed at regular intervals to ensure cleanliness. Use of sterile instruments, dressing materials, supplied preferably from the central sterile supply department must be used. Frequent bacteriological monitoring of the environment, staff and instruments must be carried out at regular intervals. Swabs should be taken and depending on the results of bacteriological examination, necessary corrective measures should be instituted.

All the walls and inside surfaces of the building must be washable. The flooring shall be made of Kotah or Shabad stones, which are hard wearing. The walls should be covered with glazed tiles preferably upto five feet above the floor. The tiles used shall be of pleasing light colors.

Staffing

Depending upon the load adequate trained staff should be posted and these should be trained to handle casualty patients.

Medical

Casualty medical officers must be posted on round the clock duty. They will be general duty medical officers with a minimum of one year experience, as senior house officers, preferably in the same hospital. The appointment is usually for three years and is renewable afterwards if the services are satisfactory.

The casualty medical officers shall function under the supervision of a senior doctor,

like a Resident Medical Officer, who will guide the C.M.Os. The senior medical officer is responsible for arranging duty roster, supervise functions of C.M.O. to ensure correct and complete documentation of the records. He should be available on call always.

Services of specialists should be available for emergency and casualty department and the specialists should be on call duty.

Nursing

The overall supervision of casualty department rests with a senior and experienced ward sister. She will be responsible for the upkeep of the casualty, including availability of equipment and instruments in working condition, and linen. She will ensure that proper procedures are followed by every one concerned. She will also ensure that adequate stock of emergency medicines is maintained in the casualty department. A staff nurse and a few student nurses will be available in this department, in institutions where nursing schools are functioning. Casualty provides an opportunity to improve and hone one's nursing skills, knowledge and attitude.

Helpers

There is need for persons to transport patients, to help in the upkeep of the place and to maintain cleanliness.

Equipment

All necessary equipment must be available without delay. Standard equipment includes Blood pressure apparatus, suction apparatus (where central facilities for suction are not available), transfusion stand etc. Ambu bags used for administration of anesthesia, laryngoscopes etc. must be checked regularly for proper working. The instruments for use in casualty department must be obtained from central sterile services department and sterilization in the casualty department is only a second best option. The CMO's room should be provided with X-ray lobbies or viewing boxes.

Furniture

Adequate furniture must be available to avoid cluttering of the space and to facilitate easy movement of men materials and equipment. Stools, dressing trolleys, chairs for dressing and similar other furniture made of stainless steel will facilitate easy maintenance of cleanliness.

Medicines

All types of emergency and life saving drugs must be available and they are usually arranged in a systematic way in the emergency trolley. Oxygen supply must be available as cylinders or piped supply.

Records

Proper recording of cases is essential. These records will be helpful when questions are

raised about handling of the patient and adequacy of care provided. If the treatment is rendered free of cost this also should be recorded in the case sheets. The records will also be of help in improving the patient care and serve as quality control tools.

The following records must be maintained in the casualty and emergency services department:

- Patient's Register
- Patient's case record
- Medico-legal registers
- Police intimation book
- Wound certificate register
- Brought – in – dead register
- Notifiable diseases register
- Patient's valuables register
- Doctor's call notebook
- Casualty incident reports book
- Other common registers for indents etc.

Medico-Legal Cases

A proportion of patients attending the casualty department of the hospitals, with bodily injuries due to accidents, constitute Medico-Legal Cases. When in doubt treat the case as medico-legal. The records must be accurate and shall be kept in safe custody, as the hospital may be required to present these courts of law. Entries regarding Medico-Legal Cases shall be made in appropriate registers and the police must be informed immediately. However, there should not be any delay, in starting the treatment, just because police has not arrived.

Another important but vexing problem is giving evidence in the courts. It is advisable to assign this responsibility to Resident Medical Officer, who will after a certain period, will develop sufficient expertise to deal with such a situation.

Health Education

Casualty provides an excellent opportunity to provide health education to the patients visiting the hospital along with their relatives. Charts for health education, signs like Smoking

is injurious to health, Family welfare measures, basic concepts about nutrition and food habits, etc. must be provided. Depending on the type of cases, received in the casualty, the attending or accompanying people may be educated regarding the evil effects of drinking, smoking and also about containment and prevention of communicable diseases.

Common Management Problems

- Poor Quality of Service
- Incompetent doctors and/or nurses.
- Staff not trained to handle emergencies
- Lack of proper policies and writing guide lines
- Prolonged waiting time
- Inability of staff to meet the demand when multiple emergencies present at the same time
- Lack of proper communication resulting in delay of doctors
- Poor public image
- Lack of courtesy on the part of staff
- Inadequate amenities
- Improper Documentation

Casualty Medical Officers – Instructions

The casualty department functions through out the day and night on all days including Sundays and public holidays. C.M.O. will function under supervision of R.M.O. or an other senior medical officer. The hours of work are arranged to ensure complete coverage.

The residents medical officer or senior medical officer should be informed about (i) medico-legal cases, (ii) multiple fractures and (iii) poisoning cases. All medico-legal cases should be admitted, unless the injury is minor, esp. in case of head injuries and poisoning.

The following cases are normally given first-aid and referred to other hospitals for better care:

Assault cases

Major burns cases

Dog bite cases for anti rabies treatment

Infectious cases where isolation may be needed

Severe head injuries

Spinal injury cases like fracture with neurological deficit, esp. if adequate facilities are not available in the institution.

In case of severe assault or injury, treatment should not be delayed or refused. Help from surgical department can be sought to treat such cases. No patient should be moved from the hospital especially if there is a chance of patient succumbing to injuries on the way.

All cases of stab wounds and serious injuries, when better facilities for treatment are not available elsewhere should be immediately admitted and treated. However, the R.M.O. or senior medical officer must be informed about such cases immediately.

If a dying declaration is to be recorded, police should be telephonically informed, so that necessary action can be initiated.

If accident victims refuse admission, or not admitted to the hospital, or transferred to other institutions, R.M.O should be kept informed.

No patient should be kept for unduly long time in casualty.

All cash and valuables on the unconscious patients must be removed immediately in presence of attendants or persons bringing the patient. These should be handed over to patient's relatives after obtaining a receipt. Otherwise, these details can be entered in register and kept in safe custody with the ward sister.

In case of child accident victims, treatment should be started and attempts to contact parents should be initiated. For this purpose, police help can be sought.

Police personnel visiting hospital to enquire about accident cases should be treated courteously. If the injured patient is fit enough to make statement casualty medical officer shall permit the police to record such a statement. Press personnel seeking any information must be directed to meet the R.M.O.

Clothes of assault victims must be kept in safe custody with the staff nurses.

Stomach wash specimens in cases of poisoning, should carefully be preserved in properly labeled containers at least for two months.

The C.M.O. should satisfy himself about the satisfactory position of medicines in the casualty department and in case of short fall should inform to staff nurse in-charge.

Drugs should be prescribed for two days as patients can attend O.P.D. for review of treatment.

In case of disasters like fire accidents, earthquakes or automobile accidents on high ways, when the load on casualty will be more, the patients are admitted to the hospital, against the existing vacant beds and remaining will be directed to other institutions. In such events, C.M.O. will inform R.M.O. and will seek assistance of other senior medical officers.

Operation Theatre (OT)

- The OT module allows the user to process and monitor OT data and services.
- This module processes schedulable and non-schedulable orders and provides the functionality of the substores module
- The user can process the service schedules carried out in various OT points.
- The OT module also monitor the consumption of pharmacy / material items and maintains pre and post operation notes.
- In addition OT supports, recording of anaesthesia notes, OT checklist, ward check list etc.

Consultation

- The module allows the user to view details of a patients such as the actual examination of the patients by the doctor, regarding of history, and findings of physical examination.

Using the clinical documentation feature integrated with this module, doctors can process and report clinical record and treatments details.

- The consulting doctor can make a request for admission for an outpatient using this module.

Two things are essential for an operating theatre to run effectively and efficiently. The first and most important is sterility. The purpose of all the precautions and care taken in operating theatres is to prevent infection occurring at the time of operation. This is particularly important for eye surgery where infection is not just a complication but a disaster. An additional risk in eye surgery is that intraocular damage may be caused by chemicals or inappropriate irrigating solutions entering the eye. The second is teamwork. Surgery is not the work of one important person, “the surgeon”, with a few other people who are not so important doing what they are told. It is the work of a whole team. Everybody in the team is equally important although obviously the surgeon has had a longer training than the others. The old proverb “the strength of a chain is its weakest link” is particularly true for operating theatre staff and procedures . It only needs one dirty instrument to introduce infection to the eye and destroy it. It only needs one person in theatre to make a mistake with fluids which are irrigated in the eye, to cause destruction of the corneal endothelium and blindness. Everyone must share the responsibility for safety and sterility. The reason for all good surgical practice is to make the operating theatre a safe place.

1. Safe for the patient who must be protected from infection and other harm. (The patient is the

most important person who needs protection.)

2. Safe for the staff from the risk of needle-stick and other injuries. These can spread Hepatitis, HIV and other infections. In those parts of the world where hepatitis and HIV infections are common, “every used needle and sharp instrument is as dangerous as a loaded gun.”

3. Safe for the community by careful and safe disposal of soiled materials, especially sharp instruments and needles.

The Theatre Team

It is important to have an adequate number of motivated and enthusiastic staff. If they are dedicated to eye surgery they will have a better understanding of the requirements of both the surgeon and the patient. A happy relaxed atmosphere and good working relationships in the theatre team makes the work much more pleasant and mistakes less likely. The theatre team should have a leader who takes responsibility for organising the work and making sure all the routine jobs are done regularly. This ensures both the safety and efficiency of theatre work. For a regular operating list the basic personnel required are:- 1. A scrubbed assistant to look after the sterile instruments and assist the surgeon. 2. An anaesthetic assistant to give the local anaesthetics, prepare the patients and if required help with any general anaesthetics. 3. A circulating nurse to clean and sterilise the instruments and apply the dressings. 4. A general assistant. It is often appropriate that the team leader assumes a fairly basic position, such as being the general assistant, in this way he or she can supervise all the other team members.

Operating Theatre Routine

There are a variety of important jobs that must be done to keep a theatre well stocked and maintained. Many of these are rather obvious, but without maintenance equipment will break down, and without planning spare parts and consumable materials will run out and take a long time to be replaced. The general routine will include:

1. Building maintenance.
2. Cleaning.
3. Maintenance of equipment and instruments.
4. Manufacture of dressings and drapes.
5. Sterilisation and disinfection procedures.
6. Stock-keeping, storage and security.

1. Building maintenance

A good sound building is an obvious requirement for safe surgery. Eye surgery can be performed in a great variety of buildings which are not purpose built operating theatres. However the room

should be as insect-proof as possible and well ventilated. It does not have to be blacked-out, although the windows should be shaded. Paint work should be in good condition and a secure water supply present. The room should have doors that can be closed during surgery. Regular inspections of the insect-proofing is important.

2. Cleaning

General cleaning should be carried out regularly in addition to preparations on the day of surgery. Floors and sometimes walls and ceilings must be washed in all rooms used as part of the operating theatre suite. Any furniture including instrument tables, operating tables and cabinets must be wiped clean to avoid the build up of dust. Spilt blood or other debris should be wiped up as soon as possible, because once dried it may be difficult to remove. A weak solution of bleach is adequate for cleaning purposes and will kill most micro-organisms including the HIV virus. Anyone who washes drapes and surgical instruments **MUST** wear gloves to protect themselves from the risk of infection.

3. Maintenance of equipment and instruments

Equipment can only function if it is regularly maintained. A schedule needs to be drawn up for items such as sterilisers, operating lights and air conditioners. The importance of having spares to enable quick repairs to be carried out locally cannot be stressed too much. Surgical instruments need to be carefully looked after and checked that they are working properly.

4. Manufacture of dressings and drapes

With modern surgery and small self sealing incisions, patients are no longer routinely given an eye pad postoperatively. However many patients still require an eye pad postoperatively and outpatients may also be padded as part of their treatment. The purpose of the eye pad is to protect the eye in the immediate post-operative period. It also prevents the patient or his attendants from interfering with the eye and keeps flies out. It prevents eye-lid movements against the eye and applies gentle pressure which will encourage haemostasis and wound closure. An eye-pad is not a substitute for poor surgery, and it is rarely necessary to keep an eye padded for more than 2 days postoperatively. The cost of buying ready-made pads is high and there are inevitable delays as a result of ordering supplies. Eye pads can be manufactured locally using cotton wool and gauze. A layer of gauze is placed on a table and onto this is put a layer of cotton wool about 2 cm thick. A further layer of gauze goes on top of the cotton wool making a cotton wool sandwich enclosed in gauze. Then, using a simple card shape as a guide, eye pads can be cut out. These are placed into an autoclave box or bin for sterilization.

5. Sterilisation and Disinfection Procedures

The sterilising of instruments, swabs, linen and eye-pads is by far the most important step in safe surgery. Sterilisation means that all living micro-organisms, bacteria, viruses, fungi etc. including spores have been killed. Disinfection means that bacteria which are likely to cause infection have been killed, but spores and some very resistant micro-organisms may survive disinfection. Obviously sterilisation is better than disinfection. There are four common ways of sterilising or disinfecting.

Methods of Sterilisation and Disinfection

1. Autoclave
2. Dry heat oven
3. Boiling
4. Immersion in chemical solutions

Autoclaving and the dry heat oven will sterilise, and boiling and chemical solutions will only disinfect. However the methods of sterilisation may only disinfect if the treatment is not applied for long enough, and a chemical which disinfects may sterilise after a long period of immersion. Instruments must first be cleaned before sterilising. The best time for cleaning instruments is immediately after they have been used, otherwise blood and secretions may become dried and encrusted. Dried blood and secretions are much more difficult to remove, and they prevent spores and bacteria from being killed by the sterilisation process. Instruments should be washed with soap and water using a soft brush or cloth, paying particular attention to the joints of scissors, artery forceps and needle holders. They should then be rinsed in clean water. If instruments are going to be stored or sterilised using dry heat or chemicals they should also be carefully dried. Theatre linen and drapes can be washed at the end of the list and left to dry in the sun.

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1. Dr. L.L. Rao, Hospital Management. Annamalai University Press
2. R. D. Lele, Computers in Medicine, Tata McGraw Hill, 2008

UNIT-II	PART – A	
1	What are the objectives of OP services?	[L1]
2	What is casualty?	[L1]
3	What do you mean by line services and supportive services?	[L1]
4	Discuss the advantage and disadvantage of OP services.	[L3]
5	State any two complaints of outpatients.	[L2]
6	What are the types of OP records?	[L1]
7	List the remedial measure for effective functioning of OP.	[L2]
	What are the functional goals of nursing units?	[L1]
9	Write any 5 general problems that interfere with smooth functioning of the ward.	[L2]
10	List the records to be maintained in the casualty and emergency services.	[L2]
	PART – B	
1	Discuss the problems encountered in functioning of OP department of a hospital. Suggest remedial measures.	[L3]
2	Write short notes on a) Casualty b) Health education.	[L2]
3	Explain the organization of OP services in a hospital.	[L3]
4	Focus on the infrastructure facilities of inpatient and emergency services.	[L4]
5	Define hospital records. Explain the different types of hospital records.	[L3]
6	Discuss ward planning in a hospital.	[L3]
7	Explain the organization of casualty and emergency services.	[L3]
8	Enumerate the factors for successful and efficient management of the ward.	[L4]

UNIT – III – Hospital Management – SBMA3009

UNIT III -SERVICES IN HOSPITAL

Organization of Ancillary Services

Laboratory Services

The laboratory services are an essential component of the hospitals, they are categorized into two types:

- 1) Public Health laboratories: These are concerned with the origin, spread and control of the disease in as community. These are concerned as yardstick to measure the community health.
- 2) Diagnostic laboratory services: These are concerned with tests for diagnosis, prognosis and response to treatment. These are often established to provide diagnostic support to other hospital departments, thus ensuring a comprehensive patient care. Members of the hospital staff are interested in these diagnostic laboratories.

The laboratories may be established in a three-tier pattern: 1) The Regional laboratories. 2) The Intermediate laboratories and 3) The local laboratories.

The local laboratories will be responsible for simpler diagnostic investigations and for public health bacteriology. The intermediate level laboratories will carry out a little more complicated diagnostic tests and also public health works as bacteriology of water, milk supplies, virological investigations and public health toxicology. The regional or central laboratory will under take full range of diagnostic and public health work.

Organization

The intermediate hospital laboratory providing the public health as well as diagnostic services, should be headed by a single director who, preferably be a pathologist. With the increase in the turn over of the laboratory services, the appointment of a full time administrative director may become necessary.

Diagnostic Laboratories

The modern diagnostic laboratories comprise of the following sub divisions:

- Haematology
- Histopathology
- Microbiology
- Biochemistry

Depending on the turnover of the work, each of these may be further subdivided into

different sections like, cytology – Exfoliative or Fine needle aspiration cytology, Blood Bank, toxicology etc.

While planning the physical infrastructure facility of the laboratory, it is important to keep in mind the importance of free flow of specimens in the laboratory. This is of importance, especially in cases where the single specimen, (like CSF, Blood, Urine or other body fluid samples) has to be subjected to multiple tests in different areas of the laboratory- Biochemistry, hematology and microbiology.

Biochemistry Department

This department is mainly concerned with carrying out both qualitative and quantitative biochemical investigations on blood samples and other body fluids like CSF, Ascitic fluid etc. The department will have subdivisions for carrying out estimation of enzymes, hormone levels and other special investigations. The department will also provide for physiological estimations like Basal Metabolic Rate (BMR). There should be provision for use of needed radio tracer elements. In addition to these diagnostic facilities, the department should be equipped to carry out toxicological studies, as a part of public health function.

Hematology Department

This department is concerned mainly with study of morphology of the blood and bone marrow. Besides this, several estimations like Blood cell counts, Hemoglobin estimation and other qualitative and quantitative estimations of the various components of blood are also carried out to help in establishing the diagnosis. In some hospitals, where a separate blood transfusion service (blood bank) is not available, the immuno-hematological tests like blood grouping cross matching, investigation of auto immune reactions, antenatal follow up in coordination with obstetrics department are also carried out in hematology laboratory. In larger hospitals, blood transfusion services constitute a separate department, the organization of which is discussed elsewhere in this book.

Hematology department should have subsections to carry out investigations of coagulation and haemorrhagic (bleeding) disorders. If possible facilities for use of radioisotopes as diagnostic tools for investigations of blood dyscrasias also may be provided.

Histopathology and Morbid Anatomy Department

This department is involved in supervision of mortuary and autopsy services besides processing the tissue received from the operation rooms. It is essential and mandatory to submit all the tissues or organs removed at the time of surgery for histopathological examination. The autopsy or postmortem room and the mortuary, if possible, may be located near the pathology department, but it is not essential. The autopsy service of the hospital should be designed in consultation with the pathologist, so that autopsies can be performed on all patients dying in the hospital.

Besides, routine processing of specimens for histopathological examination, this

department also should provide facilities for frozen section studies for rapid, intra-operative diagnosis, so as to enable the surgeon to decide on the extent of surgery, esp. in case of tumors. It is preferable to have this facility in Operation Theatre block or close to operating rooms. Another diagnostic service that comes under preview of this department is cytology- both exfoliative and fine needle aspiration cytology. Cytology is a useful diagnostic tool, as it is less painful, requires minimal or no hospitalization and can be carried out as an outpatient procedure. The results will be available earlier than histopathology. Hence this service of late is gaining acceptance among medical fraternity.

Microbiology Department

The microbiology department is an integral and essential part of diagnostic services. The activities of this department can also be extended to public health services. It is mainly concerned with identification of organisms causing diseases and infections in the hospital setting, to find out the drugs to which they are sensitive, so as to enable the clinician to institute correct treatment. The public health activity includes the identification of sources of infection in community in co-ordination with the department of epidemiology. In addition, the microbiology department is also entrusted with the responsibility of investigation and control of sepsis in the hospital.

The important subdivisions of this department are virology, mycology, parasitology and serology. In addition depending on the local circumstances, the section for medical and veterinary entomology may also be added to this service. The microbiology department is also responsible to monitor the sterility in areas of CSSD, which serves the different areas of hospital.

The hospital laboratory services may be centralized, if adequate space, equipment and space are available and proper arrangements are made to receive specimens and dispatch the reports can be made. This will be convenient, as the services are available under the supervision of the pathologist. If the laboratories are set up in the wards, ICU or O.P. department, the commitment in terms of space, staff and equipment will be higher and there is a risk of poor quality of service due to technical inaccuracies, since the services are not under the direct supervision of the pathologist.

Staffing of the Laboratory Services

Technicians

Laboratory Assistants

Administrative Staff

Auxillary Staff

Record System

An efficient record system is a fundamental requisite of the laboratory services. This should ensure

Individual results can be obtained easily with reference to the name or reference number.

Results or workload of department can be analyzed on request.

Previous reports of patients can be traced easily for comparison with current results.

Regular assessment of costs of certain investigations, departments, or sub departments can be carried out.

The data can be stored by introducing computer operations and by microfilming, which will result in marked reduction in requirement of storage space.

It is advisable to have a system of submitting monthly reports from local and intermediate laboratories regarding the volume of work done in each department, staff pattern, new developments in the laboratory, service rendered by the laboratory etc.

Suggestions to improve the public health services provided, by analyzing the health trends in the local area.

The above discussion is only a broad out line of the organization of the laboratory services and this has to be modified to suit the local needs to be effective. This can be decided only after the survey and analysis compiled by members of health department, especially pathologist, who are responsible for the service. These authorities should be actively involved in all stages of planning of the laboratory services.

Organization of Department of Physiotherapy and Occupational Therapy

The practice of medicine has progressed from curative to preventive to rehabilitative practice. At present, the aim of the personnel involved in health and medical sector is not just providing cure or relief to the patient, but restoration to the extent possible, degree of function. Thus, rehabilitation of the patient after the recovery from illness is considered important. This will enable the patient to go back to his original occupation, modify or change his profession or job so that he can be productive and will be able to contribute to the society. As this concept is gaining ground, the department of physiotherapy and occupational therapy has become essential component of patient care services.

Physiotherapy is practiced for quite some time. Here, the treatment methods included application of diathermy, radiant heat, massaging, application of short wave diathermy, action-therapy etc. These modalities of treatment are still in vogue. The patients are now encouraged to undertake controlled activity under medical supervision than rely on passive forms of treatment. Early ambulation of patients following illness or surgery is an example of this change. The planning of the physiotherapy departments should take into account this change in the trend.

Physiotherapy entails instruction of individual or group of patients about the various remedial exercises they can undertake under supervision of trained gymnasts and physiotherapists. The physiotherapy department should house a gymnasium with facilities for exercise, which is a part of the treatment. The gymnasium should be adequate size and lofty (about 5 meters in height) to allow the playing of games, which are considered a vigorous form of physiotherapy for some physicians. There should be provision for separate changing rooms for men and women, close to the gymnasium.

Another important adjunct to the physiotherapy unit is a pool which can be used to enable the weak and atrophied leg muscles of polio affected patient to develop, by bearing the weight of the patient. The pool may be located indoors or outdoors depending on the climate of the country. The pool may be simple or sophisticated, depending on the finances available.

The department should be provided with cubicles to house the instruments and equipment used to provide diathermy, radiant heat, traction, actino-therapy and massage. There should be accommodation for the director of physical medicine for consultation and examination of the patients. A separate storeroom for apparatus and one for records office must be provided.

Staff Pattern

The department is headed by a physician, who received training in physical medicine for at least three years. He will be designated as director of physical medicine. He will be assisted by physiotherapists. The physiotherapists and remedial gymnasts will apply the different methods of treatment prescribed to the patients. Supervisory physiotherapist will be responsible to oversee and coordinate the work of physiotherapists, by allocating the duties and participating in the treatment of patients.

Physiotherapy usually lasts for long periods like weeks or even months. The patients undergoing physiotherapy usually suffer from chronic illness. These patients, after a certain period of physiotherapy, may not show any further improvement. In such cases, the physiotherapists cannot discharge the patient from the treatment, as they are not authorized to do so. The decision regarding the termination of the treatment rests with the physical medicine specialist, who should periodically review such cases and take an appropriate decision. If this is not done, the physiotherapy department will be choked with chronic patients, for whom the therapy is not going to be beneficial. This unnecessary load will result in wasting of the scarce resources.

Since, physiotherapy is a prolonged treatment and majority of the patients are treated as outpatients. It may be difficult for some of the patients to commute long distances every day, for treatment. Hence it is advisable to establish physiotherapy centers in densely populated areas, and in health centers run by hospitals, away from the main hospital, so that the patients can have an easy access. These centers will function under the director of physiotherapy of the hospital. Since some of the procedures are time consuming, facilities for light refreshment and adequate waiting space with sanitary accommodation must be provided.

Occupational Therapy

Occupational therapy is another important branch of rehabilitative medicine concerned with improvement of the physical condition of the disabled so that they can be rehabilitated and gainfully employed. The occupational therapy is of two types:

- Therapeutic
- Diversional

Therapeutic Occupational Therapy

This is designed primarily to help the injured workman, to reeducate his muscles and regain his skill. As a part of the treatment, he will be set to work under the expert supervision, on tasks similar to those on which he is formerly employed. This entails setting up of workshop with facilities and tools for woodwork like carpentry, machines worked by hand or treadle and other equipment.

Diversional Occupational Therapy

This has a more psychological than physical impact on the patient. Here, the patient is helped to get better by stimulating his interest, relieving the boredom and make him feel that he is capable of doing a useful job. The patients are trained in new skills like basket weaving, candle making, toy making, papermaking, painting etc. This training will enable him to be gainfully employed and earn his livelihood. He will also be able to contribute to the society in his own way.

Organization of Blood Transfusion Services

Blood is one such commodity, which can be donated only by humans to save other's life. It is a life saving elixir, which is not available off the shelf from the medical shops. The blood available for transfusion purposes at any given time is woefully inadequate to meet the demand. Thus, every effort should be made to educate the public about the value of blood donation and encourage them to enroll as voluntary blood donors.

Organization of an efficient blood transfusion service in a hospital is essential to ensure the availability of blood to the needy patients. However, the blood transfusion services are regulated by stringent rules and regulations and the services can be organized only after obtaining license from both the central and state drug control directorates. The blood bank are regulated by Drugs and Cosmetics Act, 1940.

The infrastructure facilities should be in accordance with the recommendations of the WHO, for establishing a blood bank. The premises housing the blood bank should have the following accommodation:

Donor's Lounge Here the prospective donors are received and seated before they are interviewed to determine the eligibility. The room should be 20 × 20 ft. This room should be furnished suitably with chairs, table and magazines.

Examination Room This also measures 20×20 ft. The room is furnished to accommodate the prospective donor and the medical officer. Other furnishings like examination couch, weighing scale to record weight, provision to record height, and provision to carry out preliminary screening tests like hemoglobin level estimation. Here, the prospective donors are interviewed by the medical officer or social worker to obtain relevant clinical history, personal history, history of earlier blood donations, vaccination etc. to determine the eligibility. The interview also helps to weed out professional donors, who donate blood at frequent intervals for monetary considerations.

Blood Grouping Room This room should measure 10×20 ft. The room should be air-conditioned to maintain standard temperature and dust free environment. This is most useful in tropics where the room temperatures tend to be on the higher side.

Bleeding Room This room should be at least 20×20 ft. and should be air-conditioned. The room should have at least two couches for bleeding the donors, so that at time two units of blood can be recollected. The room should be equipped with necessary equipment and instruments for collection of the blood. A tray with lifesaving drugs, syringes and other necessary equipment for resuscitation of the donor, if such a contingency arise, must be provided in the bleeding room.

Recovery Room This room measures 20×10 ft. It is used for providing refreshments to the blood donors after bleeding. The donors can take rest for some time, before leaving the blood bank.

Cross Matching Room The blood collected from the donors should be tested to find out whether it is compatible with recipient's blood. This procedure is called cross matching. This should be carried out in an air-conditioned room. The size of the room usually is 20×20 or 10×20 ft.

Blood Storage Area This area houses the refrigerators, (specially designed for storage of blood) or walk-in coolers where blood can be stored. The area of the room shall be at least 400 sq.ft. The refrigerators and walk-in coolers generate a lot of heat and hence they should be located close to the windows, with sufficient space behind the instrument to permit free flow of air.

Components Preparation Room This room is used to separate different components of blood for administration to the patients depending on need. The components include – Packed cells, Plasma, Platelet rich plasma, WBC concentrates, clotting factors etc. The blood bank should obtain a separate license for preparation of components. The components cannot be supplied by the blood banks holding license for supply of whole blood. The room should house the equipment and instruments necessary for preparation of components.

Screening Laboratory Here the blood collected from the donors is screened for diseases transmissible by blood like, Malaria, filariasis, Hepatitis 'B', Hepatitis 'C', HIV (AIDS) and Syphilis. These tests are mandatory before the blood is issued for transfusion.

Store Room This should be of adequate size to keep the supplies like blood bags,

reagents, anti-sera, instruments, equipment, glassware etc. The blood bank should be adequately provided with refrigerators to store the test kits, anti-sera and other reagents which tend to deteriorate in absence of refrigeration and lose their potency.

Rooms for duty technicians separate for men and women and medical officer should be provided. Since blood bank is a 24 hours service, suitable provision must be made for night staff posted on duty. These rooms should be suitably furnished.

The blood bank should also be provided with adequate sanitary facilities, as this area is frequented by people, both the staff and public.

The blood banks are licensed for manufacture of (a) Whole blood and (b) components. The license requirements differ for both the types of products.

Staff Requirements

The following are the mandatory staff requirements for the blood banks:

- Medical Officers with PG qualification in Pathology or Microbiology – ONE
- Medical Officer with MBBS qualification – ONE
- Qualified Technicians with experience in blood bank – SIX
- Laboratory Assistants – SIX
- Store keepers – ONE
- Record Clerks – TWO

Procedure to be followed before accepting blood donor

Identification of the Donor Filling up the identity card with details like Name, Age, Sex, Address, Telephone Number, Marital Status, Occupation, Date of Last Donation.

Age Minimum is 18 years and maximum 59 years, if the person is healthy. Blood donors below 21 years of age are required to produce permission letter issued by a responsible person.

Sex Women during menstrual period are not accepted as donor.

Occupation The people employed as flight crews should not go to work for one week. People who are required to climb on scaffolds and ladders, and operators of heavy equipment should not report to work at least until 12 hours.

Interval between donations Minimum interval is 12 weeks. The maximum number of donations permissible in one year is not more than five.

Medical History

The medical history regarding the following diseases should be taken before accepting the donors:

Malaria H/o treatment for malaria, with no clinical attack of malaria in the last one year may be accepted.

Syphilis Patient with active disease and person with positive serological test for syphilis are excluded.

Jaundice and Viral Hepatitis Any person with a positive history of jaundice or viral hepatitis in the last two years is not eligible to donate blood.

Tuberculosis, Diabetes(Insulin dependent), Heart diseases like coronary heart disease, severe hypertension, recent rheumatic heart disease, congestive cardiac failure and pregnancy – donors not accepted.

Medical Examination

- Temperature
- Blood pressure
- Pulse rate
- Hemoglobin
- Weight: Minimum acceptable weight is 45 Kg or 100 pounds. No maximum sealing for weight if the person is otherwise healthy and normal.

Records to be maintained in the blood bank

- Blood donor register
- Blood grouping register
- Blood crossmatching register
- Blood screening register
- Blood issue register
- Transfusion reactions register
- Register showing the stocks of supplies of blood bank-stores register

- Blood bank indent book
- Blood bank procedures manual

Organization of the Department of Radiodiagnosis

The department of Radio-diagnosis has a great potential for growth and expansion. This department deserves generous allocation of space in the hospital. The department should be located in as separate building of its own.

The X-ray machines are costly and have a very short life before becoming obsolete. Hence, these machines should be put to maximum use during their life span. Even the radiographers are a scarce commodity and effective utilization of their services is essential. To achieve this, the X-ray rooms should be centralized to optimize the utility of both the men and machines.

The department caters to outpatients, inpatients, patients from casualty and emergency services and patients referred by private practitioners. In view of this, it is ideal to locate the department between the out patient department and the ward blocks and should be easily accessible to the emergency and casualty department. Such a location will reduce the unnecessary handling of badly injured patients during the transport.

It is desirable that the department be divided into two areas, one to deal with the emergencies and accidents brought to the hospital. The cases of fractures referred from the O.P. also may be attended by this department. The other section will deal with the patients coming for X-ray on prior appointment from the O.P. wards and from general practitioners. The patients who need preliminary preparation like patients for barium series etc. are also attended to by this section.

The hospitals should have facilities for routine radiological services, even at the local hospital level. The central and regional hospitals should provide for special investigations like angiography, neuroradiology and other sophisticated procedures.

As far as possible the general purpose machines should not be installed in the rooms. If two or more X-ray machines are installed in the same room, only one machine can be used at a time. The rooms for installing X-ray units should be rectangular and 5×4 meters in size. The dark room should be placed between two X-ray rooms to economize on staff and space. It is better to install automatic processing machines in the department, to ensure faster processing. This will almost dispense with the necessity for dark rooms as the films are processed and dried in a very short time.

Since the department receives patients wheeled on trolleys and wheel chairs besides he ambulatory patients, ample waiting space must be provided in this department. For the patients, clad in dressing gowns, who undergo serial examinations spread over a longer time, separate waiting rooms for each sex should be provided.

For barium examinations, a suite of rooms is required to accommodate barium kitchen, a room for each sex for rectal wash outs, a water closet for each sex and one or two rooms where patients can lie down and take rest before going home.

Besides this adequate space must be provided for office accommodation for registration of patients, space for filing the old X-rays, a small store room to keep the unexposed X-ray films and a room with sink to store reagents and for making up various solutions. Mobile X-ray machines must be available in the department and storage space for these must be provided.

There must be office accommodation for each radiologist, generously equipped with viewing screens or boxes, where the reporting on films can be done. Office accommodation for radiographers and secretaries should also be provided.

Radiation Hazards

The radiographers and radiologists and other staff are at risk of exposure of radiation. The design and construction of the department should be done in such a way the radiation scatter is kept at minimum. The radiographer taking the X-ray must be protected by a lead-glass screen in the same room or adjoining room. Installation of image intensifiers is recommended if the department is involved in a great deal of screening.

In large regions, where there are many hospitals, it is advisable to have a central regional staff comprising of a radiation physicist or an electronic engineer who can advise on the layout of the new departments, diagnose and rectify the faults in the equipment and to detect the radiation leaks using the Geiger counter in the X-ray departments of the hospitals in the region.

Installation of a miniature X-ray units in the hospital is recommended to screen the patients referred to the hospital by general practitioners of the region, outpatients of the hospital who are not too ill. This unit should be housed in a separate suite, separate from the main X-ray department. It should have waiting area and a small office. The unit is useful for screening a large number of patients for evidence for tuberculosis and the program is called Mass Miniature Radiography (MMR) program. In case of patients referred by practitioners two anteroposterior chest films, one for the hospital and another to be sent to the referring doctor. The additional cost is not significant.

Department of Radiotherapy

Radiotherapy in skilled hands is a very useful therapeutic tool. But in less skilled hands it can be hazardous and cause serious damage to the body. An in correctly planned course of treatment may result in serious injury and deprive him of the benefit of the treatment even if comes under the care of a good radio-therapist, at a later date.

The planning and establishment of this department calls for a very high degree of specialization and all the hospitals cannot be provided with this facility. The buildings that house the sophisticated equipment are designed with special care according to the

specifications accepted worldwide. Any laxity in the precautions may prove calamitous and can lead to grave consequences.

The facilities for radiotherapy in our country are confined to certain regional hospitals scattered over the country. Because of the paucity of radiotherapy centers, patients sometimes have to travel considerable distances for the treatment. To avoid unnecessary crowding of the radiotherapy centers, a system of referrals for radiotherapy should be designed. The terminally ill cases, who may not be able to withstand the rigors of radiotherapy and unlikely to benefit such treatment, should not be sent to radiotherapy centers for diagnosis. One of the radio therapists from the regional or central hospital can pay regular visit the peripheral centers to examine the cases and determine whether they can withstand the treatment and benefited. If the radio therapist is convinced that the patients may have a chance to improve, they can be transferred to the radiotherapy center. Follow up, which is essential in these cases can be done locally by the radio therapists during his periodical visits. However if the radio therapist has to visit the peripheral hospitals on a regular basis, sufficient number of radio therapists must be appointed to the service.

Radioisotopes are usually used in medicine for both diagnostic and treatment purposes. These isotopes are not issued to the hospital unless it has adequate staff, equipment and accommodation. The services of a physicist and qualified technicians are essential. A suitably equipped laboratory for handling the radio active substances, and the apparatus to measure the radioactivity are also required. However, it is wise to restrict the use of isotopes to some well established radiotherapy departments where facilities are available.

The Hospital Pharmacy

The pharmacy in the hospitals was started primarily for purchase and formulations of drugs, medicinal preparations, chemical reagents and other related materials. The pharmacy is utilized for compounding of medicines as and when necessary. The department is also responsible for safe storage and issue. However, at present many hospitals have dispensed the system of compounding to issue the medicines to their patients. At present, the hospitals issue prescriptions of proprietary preparations which the patients has to obtain from the medical stores.

The secondary function of the pharmacy is to provide guidance to the medical and nursing staff about the pharmacological properties and characteristics of the drugs and their function. However, this function is handled poorly. It should also help the medical and nursing staff in monitoring the efficacy of the drug therapy. The pharmacy department is also involved in medical, pharmaceutical and pharmacological research. The pharmacist should be aware of the cost of various drugs of equal potency manufactured by different companies. He will be able to control the costs of drugs. He can also furnish useful information to the doctors about various drugs and medicines and formulations available in the market.

The pharmacy department should always maintain close and continuous relationship with medical and nursing services.

The pharmacy department should follow established material management methods for

purchase, storage and issue of the medicines and drugs to the different sections of the hospitals and maintaining relevant records. The department should strive to see that there is no shortage of the drugs and medicines, so that the patient care is not adversely affected. The department should establish a system for estimating the requirements, and obtaining the quotations, placing the orders, receiving the supplies, making stock entries, passing the bills for payment, storage and issue of the drugs to the different sections of the hospital.

Staff Pattern

The staff requirement of the pharmacy depends on the services provided by the department and also the number of prescriptions received. Normally, besides the chief pharmacist, there will be one pharmacist for 50-100 beds. The number of the pharmacists also vary with the number of hours the pharmacy is open. Besides these, administrative staff is also required.

Physical Facilities

Site

The pharmacy serves both inpatients and outpatients. It is ideal to locate it near the exit as the pharmacy is usually the last place visited by the patients visiting the hospital. It should be accessible to the staff, relatives of the patients admitted to the wards, and also to the suppliers. The building housing the pharmacy should have strong walls to eliminate the risk of theft.

Size

This depends on various factors like – the size and type of the hospital and also whether the hospital encourages rational use of drugs. In hospitals where use of drugs is rationalized, the size of the inventory and consequently the space requirement will be less.

Space

The following are the recommended space requirements for a medium sized hospital:

- Three dispensing counters and one separate cash counter
- Two store rooms. This includes standard and refrigerated stores.
- Administrative offices with record keeping, filing, bin cards, registers etc.
- Rooms for compounding and production if undertake. (Now a days this is not practiced in the hospitals).
- Small library

- Enough circulation space.

Equipment

Refrigerators for storing vaccines and sera and other substances requiring refrigeration. The refrigerators should be provided with recording thermometers, so as to enable us to know the temperature inside.

Adequate number of shelves (preferably of varying sizes), filing cabinets, Kardex etc.

Other requirement, if any:

- Furniture
- Room for pharmacist
- Room for records

Since the pharmacies are not engaged in preparation of intravenous fluids and dispensing the prescriptions other requirements regarding the space and equipment are not included here.

The drugs should be arranged in a systematic manner along the shelves, so as to enable the pharmacists to identify them easily, take and replace them as and when needed. The arrangement should be such that the walking within the pharmacy should be minimum. The most commonly used drugs should be easily available, preferably pre-packed, containing usually prescribed numbers.

Working Hours

The hospital pharmacy may be kept open all through 24 hours or it may be kept open in two shifts or one shift with staggered timings. However, it is essential to ensure the availability of largest number of pharmacies between 9.00 A.M. and 3.00 P.M. A separate night pharmacy, where emergency drugs and small quantities of other commonly used drugs are stocked can also function, separate from the main pharmacy, for the convenience of patients.

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UNIT – III**PART – A**

1	Explain cross matching.
2	Explain the role of physiotherapy.
3	What do you mean by blood transfusion services?
4	What are the procedures to be followed before issuing blood for transfusion purposes?
5	What do you mean by MRI?
6	What is radiotherapy?
7	What are ancillary services?
8	What is occupational therapy?
9	Write a short note on ICU.
10	Define pharmacy.

PART – B

1	Discuss the importance on a) Occupational therapy in patient care b) Blood transfusion.
2	Explain the various ancillary services to be provided in a hospital.
3	What are the different functions of Radiology department?
4	Explain the major responsibilities of physiotherapy and radiotherapy.
5	Describe the steps involved in blood collection from the donor blood banks.
6	Write short notes on a) Operation theatre b) ICU.
7	Explain the records to be maintained in blood bank.
8	Explain the organization of a) Hospital pharmacy b) Radiation hazards.

UNIT – IV – Hospital Management – SBMA3009

UNIT IV STERILIZATION AND HOSPITAL SAFETY

Disease Transmission

Health is defined as a complete state of physical, mental and social well-being and not the mere absence of disease. The term **disease** refers to a disturbance in the normal functioning of the body and is used interchangeably with 'illness'. Diseases may be classified as communicable or non-communicable. **Communicable diseases** are caused by infectious agents that can be transmitted to other people from an infected person, animal or a source in the environment. the organisms that cause communicable diseases are called **infectious agents**, and their transmission to new uninfected people is what causes communicable diseases; (note that **infectious diseases** is an interchangeable term). Familiar examples of communicable diseases are malaria and tuberculosis. Diseases such as heart disease, cancer and diabetes mellitus, which are not caused by infectious agents and are not transmitted between people, are called **non-communicable diseases**.

Endemic and epidemic diseases

Not all communicable diseases affect a particular group of people, such as a local community, a region, a country or indeed the whole world, in the same way over a period of time. Some communicable diseases persist in a community at a relatively constant level for a very long time and the number of individuals affected remains approximately the same. These communicable diseases are known as **endemic** to that particular group of people

By contrast, the numbers affected by some communicable diseases can undergo a sudden increase over a few days or weeks, or the rise may continue for months or years. When a communicable disease affects a community in this way, it is referred to as an **epidemic**. Malaria is endemic in some areas of Ethiopia, and it also occurs as epidemics due to an increase in the number of cases suddenly at the beginning or end of the wet season.

Prevention and control measures

The health problems due to communicable diseases can be tackled by the application of relatively easy measures at different levels of the health system. Here, we will use some examples at the individual and community levels, which are relevant to your work as a Health Extension Practitioner.

Some measures can be applied before the occurrence of a communicable disease to protect a community from getting it, and to reduce the number of cases locally in the future. These are called **prevention measures**. For example, vaccination of children with the measles vaccine is a prevention measure, because the vaccine will protect children from getting

measles. **Vaccination** refers to administration of vaccines to increase resistance of a person against infectious diseases.

Once a communicable disease occurs and is identified in an individual, measures can be applied to reduce the severity of the disease in that person, and to prevent transmission of the infectious agent to other members of the community. These are called **control measures**. For example, once a child becomes infected with measles, treatment helps reduce the severity of the disease, and possibly prevents the child's death, but at the same time it decreases the risk of transmission to other children in the community. In this context, treatment of measles is considered a control measure.

Factors involved in the transmission of communicable diseases

Transmission is a process in which several events happen one after the other in the form of a chain. Hence, this process is known as a **chain of transmission** (Figure 1.1). Six major factors can be identified: the infectious agent, the reservoir, the route of exit, the mode of transmission, the route of entry and the susceptible host. We will now consider each of these factors in turn.

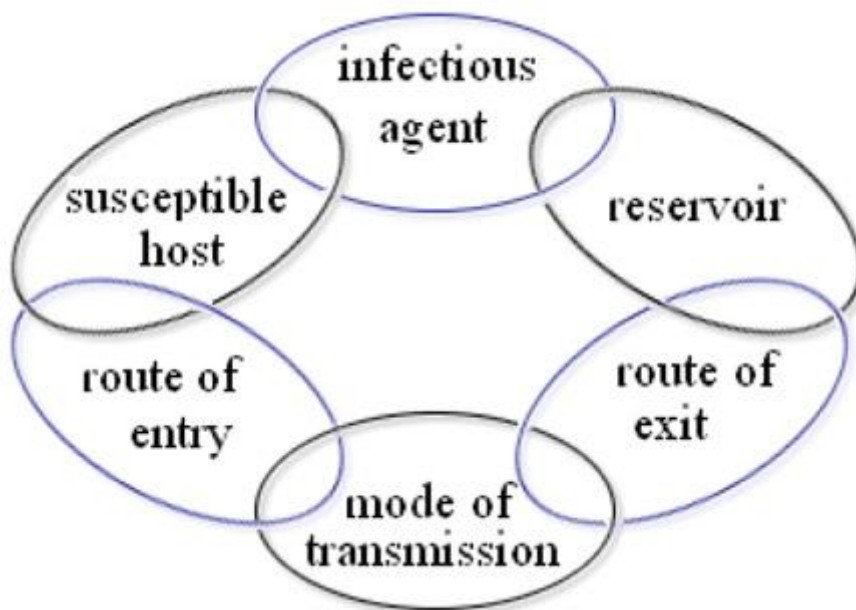


Figure 4.1 Factors involved in the chain of communicable disease transmission.

Infectious agents

Plasmodium falciparum as an infectious agent causing malaria. This is an example of how infectious agents are named scientifically, using a combination of two words, the 'genus' and the 'species' names. The genus name is written with its initial letter capitalised, followed by the species name which is not capitalised. In the example above, *Plasmodium* is the genus name

and falciparum refers to one of the species of this genus found in Ethiopia. There are other species in this genus, which also cause malaria, e.g. Plasmodium vivax.

Helminths are worms made up of many cells; for example, Ascaris lumbricoides.

Protozoa are micro-organisms made up of one cell; for example, Plasmodium falciparum.

Bacteria are also micro-organisms made up of one cell, but they are much smaller than protozoa and have a different structure; for example Vibrio cholerae, which causes cholera.

Viruses are infectious agents that do not have the structure of a cell. They are more like tiny boxes or particles and are much smaller than bacteria; for example, **HIV** (the Human Immunodeficiency Virus), which can lead to AIDS.

Though not as common as causes of communicable disease in humans, other types of infectious agents include fungi (e.g. ringworm is caused by a fungus infection), and mites (similar to insects), which cause scabies.

Sizes and types of infectious agents

Infectious agents can have varying sizes. Some, such as Plasmodium falciparum and all bacteria and viruses, are tiny and are called **micro-organisms**, because they can only be seen with the aid of microscopes. Others, such as the ascaris worm (Ascaris lumbricoides), can be easily seen with the naked eye.

Reservoirs of infectious agents

Many infectious agents can survive in different organisms, or on non-living objects, or in the environment. Some can only persist and multiply inside human beings, whereas others can survive in other animals, or for example in soil or water. The place where the infectious agent is normally present before infecting a new human is called a **reservoir**. Without reservoirs, infectious agents could not survive and hence could not be transmitted to other people. Humans and animals which serve as reservoirs for infectious agents are known as **infected hosts**. Two examples are people infected with HIV and with the bacteria that cause tuberculosis; these infectious agents persist and multiply in the infected hosts and can be directly transmitted to new hosts.

Animals can also be reservoirs for the infectious agents of some communicable diseases. For example, dogs are a reservoir for the virus that causes rabies (Figure 1.3). Diseases such as rabies, where the infectious agents can be transmitted from animal hosts to susceptible humans, are called **zoonoses**

Non-living things like water, food and soil can also be reservoirs for infectious agents, but they are called **vehicles** (not infected hosts) because they are not alive. You will learn more about them later in this study session.

Direct modes of transmission

Direct transmission refers to the transfer of an infectious agent from an infected host to a new host, without the need for intermediates such as air, food, water or other animals. Direct modes of transmission can occur in two main ways:

Person to person: The infectious agent is spread by direct contact between people through touching, biting, kissing, sexual intercourse or direct projection of respiratory droplets into another person's nose or mouth during coughing, sneezing or talking. A familiar example is the transmission of HIV from an infected person to others through sexual intercourse.

Transplacental transmission: This refers to the transmission of an infectious agent from a pregnant woman to her fetus through the placenta. An example is mother-to-child transmission (MTCT) of HIV.

Indirect modes of transmission

Indirect transmission is when infectious agents are transmitted to new hosts through intermediates such as air, food, water, objects or substances in the environment, or other animals. Indirect transmission has three subtypes:

Airborne transmission: The infectious agent may be transmitted in dried secretions from the respiratory tract, which can remain suspended in the air for some time. For example, the infectious agent causing tuberculosis can enter a new host through airborne transmission.

Vehicle-borne transmission: A **vehicle** is any non-living substance or object that can be contaminated by an infectious agent, which then transmits it to a new host. **Contamination** refers to the presence of an infectious agent in or on the vehicle.

Vector-borne transmission: A **vector** is an organism, usually an arthropod, which transmits an infectious agent to a new host. Arthropods which act as vectors include houseflies, mosquitoes, lice and ticks.

Sterilization: Sterilization describes a process that destroys or eliminates all forms of microbial life and is carried out in health-care facilities by physical or chemical methods.

Disinfection: Disinfection describes a process that eliminates many or all pathogenic microorganisms, except bacterial spores, **on inanimate** objects.

Cleaning: Cleaning is removal of visible soil (e.g., organic and inorganic material) from objects and surfaces. It is normally accomplished manually or mechanically using water with detergents

or enzymatic products.

Decontamination: Decontamination removes pathogenic microorganisms from objects so they are safe to handle, use, or discard.

Methods of Sterilization

The various methods of sterilization are:

1. Physical Method
 - (a) Thermal (Heat) methods
 - b) Radiation method
 - c) Filtration method
2. Chemical Method
3. Gaseous method

Heat Sterilization

Heat sterilization is the most widely used and reliable method of sterilization, involving destruction of enzymes and other essential cell constituents. The process is more effective in hydrated state where under conditions of high humidity, hydrolysis and denaturation occur, thus lower heat input is required. Under dry state, oxidative changes take place, and higher heat input is required.

This method of sterilization can be applied only to the thermostable products, but it can be used for moisture-sensitive materials for which dry heat (160- 180°C) sterilization, and for moisture-resistant materials for which moist heat (121-134°C) sterilization is used.

Dry Heat Sterilization: Examples of Dry heat sterilization are:

1. Incineration
2. Red heat
3. Flaming
4. Hot air oven

It employs higher temperatures in the range of 160-180°C and requires exposures time up to 2 hours, depending upon the temperature employed. The benefit of dry heat includes good penetrability and non-corrosive nature which makes it applicable for sterilizing glass-ware and metal surgical instruments. It is also used for sterilizing non-aqueous thermo-stable liquids and thermo-stable powders. Dry heat destroys bacterial endotoxins (or pyrogens) which are difficult to eliminate by other means and this property makes it applicable for sterilizing glass bottles which are to be filled aseptically.

Hot-air oven

Dry heat sterilization is usually carried out in a hot air oven, which consists of the following:

- (i) An insulated chamber surrounded by an outer case containing electric heaters.
- (ii) A fan
- (iii) Shelves
- (iv) Thermocouples
- (v) Temperature sensor
- (vi) Door locking controls.

Moist Heat Sterilization: Moist heat may be used in three forms to achieve microbial inactivation

1. Dry saturated steam – Autoclaving
2. Boiling water/ steam at atmospheric pressure
3. Hot water below boiling point

Moist heat sterilization involves the use of steam in the range of 121-134°C. Steam under pressure is used to generate high temperature needed for sterilization. Saturated steam acts as an effective sterilizing agent. Steam for sterilization can be either wet saturated steam (containing entrained water droplets) or dry saturated steam (no entrained water droplets).

Autoclaves use pressurized steam to destroy microorganisms, and are the most dependable systems available for the decontamination of laboratory waste and the sterilization of laboratory glassware, media, and reagents. For efficient heat transfer, steam must flush the air out of the autoclave chamber. Before using the autoclave, check the drain screen at the bottom of the chamber and clean if blocked. If the sieve is blocked with debris, a layer of air may form at the bottom of the autoclave, preventing efficient operation. Autoclaves should be tested periodically with biological indicators like spores of *Bacillus stearothermophilus* to ensure proper function. This method of sterilization works well for many metal and glass items but is not acceptable for rubber, plastics, and equipment that would be damaged by high temperatures.

Gaseous Sterilization

The chemically reactive gases such as formaldehyde, (methanol, H₂CHO) and ethylene oxide (CH₂)₂O possess biocidal activity. Ethylene oxide is a colorless, odorless, and flammable gas.

The mechanism of antimicrobial action of the two gases is assumed to be through alkylations of

sulphydryl, amino, hydroxyl and carboxyl groups on proteins and amino groups of nucleic acids. The concentration ranges (weight of gas per unit chamber volume) are usually in range of 800-1200 mg/L for ethylene oxide and 15-100 mg/L for formaldehyde with operating temperatures of 45-63°C and 70-75°C respectively.

Both of these gases being alkylating agents are potentially mutagenic and carcinogenic. They also produce acute toxicity including irritation of the skin, conjunctiva and nasal mucosa.

Ethylene oxide sterilizer: An ethylene oxide sterilizer consists of a chamber of 100-300-Litre capacity and surrounded by a water jacket. Air is removed from sterilizer by evacuation, humidification and conditioning of the load is done by passing sub-atmospheric pressure steam, then evacuation is done again and preheated vaporized ethylene oxide is passed. After treatment, the gases are evacuated either directly to the outside atmosphere or through a special exhaust system.

Ethylene oxide gas has been used widely to process heat-sensitive devices, but the aeration times needed at the end of the cycle to eliminate the gas made this method slow.

Hydrogen Peroxide Sterilization: This method disperses a hydrogen peroxide solution in a vacuum chamber, creating a plasma cloud. This agent sterilizes by oxidizing key cellular components, which inactivates the microorganisms. The plasma cloud exists only while the energy source is turned on. When the energy source is turned off, water vapor and oxygen are formed, resulting in no toxic residues and harmful emissions. The temperature of this sterilization method is maintained in the 40-50°C range, which makes it particularly well-suited for use with heat-sensitive and moisture-sensitive medical devices. The instruments are wrapped prior to sterilization, and can either be stored or used immediately.

Radiation Sterilization

Many types of radiation are used for sterilization like electromagnetic radiation (e.g. gamma rays and UV light), particulate radiation (e.g. accelerated electrons). The major target for these radiation is microbial DNA. Gamma rays and electrons cause ionization and free radical production while UV light causes excitation.

Radiation sterilization with high energy gamma rays or accelerated electrons has proven to be a useful method for the industrial sterilization of heat sensitive products. But some undesirable changes occur in irradiated products, an example is aqueous solution where radiolysis of water occurs.

Radiation sterilization is generally applied to articles in the dry state; including surgical

instruments, sutures, prostheses, unit dose ointments, plastic syringes and dry pharmaceutical products. UV light, with its much lower energy, and poor penetrability finds uses in the sterilization of air, for surface sterilization of aseptic work areas, for treatment of manufacturing grade water, but is not suitable for sterilization of pharmaceutical dosage forms.

Gamma ray Sterilizer: Gamma rays for sterilization are usually derived from cobalt-60 source, the isotope is held as pellets packed in metal rods, each rod carefully arranged within the source and containing 20 KCi of activity. This source is housed within a reinforced concrete building with 2 m thick walls. Articles being sterilized are passed through the irradiation chamber on a conveyor belt and move around the raised source.

Ultraviolet Irradiation: The optimum wavelength for UV sterilization is 260 nm. A mercury lamp giving peak emission at 254 nm is the suitable source of UV light in this region.

Filtration Sterilization

Filtration process does not destroy but removes the microorganisms. It is used for both the clarification and sterilization of liquids and gases as it is capable of preventing the passage of both viable and non viable particles.

The major mechanisms of filtration are sieving, adsorption and trapping within the matrix of the filter material. Sterilizing grade filters are used in the treatment of heat sensitive injections and ophthalmic solutions, biological products and air and other gases for supply to aseptic areas. They are also used in industry as part of the venting systems on fermentors, centrifuges, autoclaves and freeze driers. Membrane filters are used for sterility testing.

Application of filtration for sterilization of gases: HEPA (High efficiency particulate air) filters can remove up to 99.97% of particles >0.3 micrometer in diameter. Air is first passed through prefilters to remove larger particles and then passed through HEPA filters. The performance of HEPA filter is monitored by pressure differential and airflow rate measurements.

There are two types of filters used in filtration sterilization

Depth filters: Consist of fibrous or granular materials so packed as to form twisted channels of minute dimensions. They are made of diatomaceous earth, unglazed porcelain filter, sintered glass or asbestos.

Membrane filters: These are porous membrane about 0.1 mm thick, made of cellulose acetate, cellulose nitrate, polycarbonate, and polyvinylidene fluoride, or some other synthetic material. The membranes are supported on a frame and held in special holders. Fluids are made to transverse membranes by positive or negative pressure or by centrifugation.

Application of filtration for sterilization of liquids: Membrane filters of 0.22 micrometer nominal pore diameter are generally used, but sintered filters are used for corrosive liquids, viscous fluids and organic solvents. The factors which affects the performance of filter is the titre reduction value, which is the ratio of the number of organism challenging the filter under defined conditions to the number of organism penetrating it. The other factors are the depth of the membrane, its charge and the tortuosity of the channels.

Chemical methods of Disinfection

Disinfectants are those chemicals that destroy pathogenic bacteria from inanimate surfaces. Some chemicals when used at appropriate concentration for appropriate duration can be used for sterilization and are called sterilant liquids. Those chemicals that can be safely applied over skin and mucus membranes are called antiseptics.

An ideal antiseptic or disinfectant should have following properties:

1. Should have wide spectrum of activity
2. Should be able to destroy microbes within practical period of time
3. Should be active in the presence of organic matter
4. Should make effective contact and be wettable
5. Should be active in any pH
6. Should be stable
7. Should have long shelf life
8. Should be speedy
9. Should have high penetrating power
10. Should be non-toxic, non-allergenic, non-irritative or non-corrosive
11. Should not have bad odour
12. Should not leave non-volatile residue or stain
13. Efficacy should not be lost on reasonable dilution
14. Should not be expensive and must be available easily

Such an ideal disinfectant is not yet available. The level of disinfection achieved depends on contact time, temperature, type and concentration of the active ingredient, the presence of organic matter, the type and quantum of microbial load. The chemical disinfectants at working concentrations rapidly lose their strength on standing.

Classification of disinfectants:

1. Based on consistency
 - (a) Liquid (E.g., Alcohols, Phenols)
 - (b) Gaseous (Formaldehyde vapour)
2. Based on spectrum of activity
 - (a) High level
 - (b) Intermediate level
 - Low level

Alcohols

Mode of action: Alcohols dehydrate cells, disrupt membranes and cause coagulation of protein.

Examples: Ethyl alcohol, isopropyl alcohol and methyl alcohol

Application: A 70% aqueous solution is more effective at killing microbes than absolute alcohols. 70% ethyl alcohol (spirit) is used as antiseptic on skin. Isopropyl alcohol is preferred to ethanol. It can also be used to disinfect surfaces. It is used to disinfect clinical thermometers. Methyl alcohol kills fungal spores, hence is useful in disinfecting inoculation hoods.

Disadvantages: Skin irritant, volatile (evaporates rapidly), inflammable

Aldehydes

Mode of action: Acts through alkylation of amino-, carboxyl- or hydroxyl group, and probably damages nucleic acids. It kills all microorganisms, including spores.

Examples: Formaldehyde, Glutaraldehyde

Application: 40% Formaldehyde (formalin) is used for surface disinfection and fumigation of rooms, chambers, operation theatres, biological safety cabinets, wards, sick rooms etc. Fumigation is achieved by boiling formalin, heating paraformaldehyde or treating formalin with potassium permanganate. It also sterilizes bedding, furniture and books. 10% formalin with 0.5% tetraborate sterilizes clean metal instruments. 2% glutaraldehyde is used to sterilize thermometers, cystoscopes, bronchoscopes, centrifuges, anaesthetic equipments etc. An exposure of at least 3 hours at alkaline pH is required for action by glutaraldehyde. 2% formaldehyde at 40°C for 20 minutes is used to disinfect wool and 0.25% at 60°C for six hours to disinfect animal hair and bristles.

Heavy Metals

Mode of action: Act by precipitation of proteins and oxidation of sulfhydryl groups. They are bacteriostatic.

Examples: Mercuric chloride, silver nitrate, copper sulfate, organic mercury salts (e.g.,

mercurochrome, merthiolate)

Applications: 1% silver nitrate solution can be applied on eyes as treatment for ophthalmia neonatorum (Crede's method). This procedure is no longer followed. Silver sulphadiazine is used topically to help to prevent colonization and infection of burn tissues. Mercurials are active against viruses at dilution of 1:500 to 1:1000. Merthiolate at a concentration of 1:10000 is used in preservation of serum. Copper salts are used as a fungicide.

Hospital safety

Patient safety is a discipline that emphasizes safety in health care through the prevention, reduction, reporting, and analysis of error and other types of unnecessary harm that often lead to adverse patient events. The frequency and magnitude of avoidable adverse events, often known as patient safety incidents, experienced by patients was not well known until the 1990s, when multiple countries reported significant numbers of patients harmed and killed by medical errors. Recognizing that healthcare errors impact 1 in every 10 patients around the world, the World Health Organization calls patient safety an endemic concern. Indeed, patient safety has emerged as a distinct healthcare discipline supported by an immature yet developing scientific framework. There is a significant transdisciplinary body of theoretical and research literature that informs the science of patient safety.

Radiation safety

Radiation is a component of man's physical environment, and is broadly classified into ionizing and non-ionizing radiation. The most energetic form and of major public health significance is ionizing radiation. In normal circumstances 80% of our exposure to ionizing radiation comes from natural sources of which radon gas is by far the most significant, while the other 20% comes from man-made sources, primarily medical X-rays. Use of ionizing radiation in medical imaging for diagnostic and interventional purposes has risen dramatically in recent years with a concomitant increase in exposure of patients and health workers to radiation hazards; medical and dental X-rays now constitute the major man-made sources of radiation exposure. One of the root causes of excessive radiation exposure arises from the fact that many in the healthcare field who work with radiation have received only rudimentary radiation training. Whereas interventional radiologists are trained in the safe use of radiation, interventional cardiologists and vascular surgeons, for instance, typically receive minimal radiation training. Because they typically are unfamiliar with all of the sources of radiation exposure, they may know little about risk-reduction and safety strategies. Compounding the problem is that, while a radiologist's key team member is a radiologic technologist (who also

has received radiation safety training), an interventional cardiologist or vascular surgeon's key team member may be a nurse, who likely has received little to no radiation safety training. That's not to say that all radiologists employ best radiation safety practices, either. Despite their training, many of them have become complacent.

Additionally, we often use far more radiation than necessary. In the United States, there is an increased emphasis on ensuring the highest quality images, which means more radiation. That's not the case in Europe and Japan, where safety is more highly valued. The ideal dose is the least amount of radiation possible to produce an acceptable image. A good operator knows how to produce good images without excess radiation.

In most hospitals, radiation safety is the joint responsibility of the facility's radiation safety officer and the technologists who work in the department. The safety officer keeps track of healthcare workers' radiation exposure via the dosimetry badges that should be worn at all times and turned in every month for exposure assessment by an outside company. The American Council on Radiation Protection & Measurements allows that those who work with radiation can safely receive 5,000 millirems a year, in addition to what they receive in background radiation. Once or twice a year, the state typically performs an inspection. Additionally, the Joint Commission requires hospitals to have written procedures regarding the use of precautions and personal protective equipment regarding the use of hazardous materials, which include radiation and x-ray equipment. The Commission requires that hospitals provide protective devices, such as lead aprons and shields, and show they are worn as required. They also require records be maintained regarding individual worker exposure, as recorded by dosimetry badges.

Radiation is an important diagnostic tool, but it must be treated with respect. It has become apparent that there is significant room for improvement in radiation safety practices, which can vary widely from institution to institution, and from clinician to clinician. All who work in hospital radiation environments, including technologists, nurses, physicians and others, must make a commitment to the safer use of radiation, for the good of everyone.

safety disposal of biological waste

Biological waste includes:

- liquids such as used cell culturing media, supernatant, blood or blood fractions (serum), etc., which contain viable biological agents;
- materials considered pathological, including any part of the human body, tissues and bodily fluids, but excluding fluids, extracted teeth, hair, nail clippings and the like that are not infectious;

- any part of an animal infected [or suspected to be infected] with a communicable disease;
- non-sharp, solid laboratory waste (empty plastic cell culture flasks and petri dishes, empty plastic tubes, gloves, wrappers, absorbent tissues, etc.) which may be, or is known to be, contaminated with viable biological agents;
- all sharp and pointed items used in medical care, diagnosis, and research, including the manipulation and care of laboratory animals, which should be considered potentially infectious;
- laboratory glassware which is known or suspected to be contaminated with hazardous biological agents.

Segregation and Handling

Infectious, Potentially Infectious, or R-DNA Biological Waste

Waste items that are, contain, or are contaminated with:

- human, animal, or plant pathogens
- recombinant nucleic acids (e.g. rDNA)
- human / primate blood, blood products, tissues, cultures, cells, or other potentially infectious material (OPIM)
- cultures

This waste must be inactivated (e.g. autoclaved or bleach treated) before it leaves the facility.

Non-inactivated waste must be stored in the generating laboratory – do not leave unattended.

Waste biohazardous for humans must be labeled with the biohazard symbol.

Infectious waste must be kept covered and must be inactivated within 24 hrs.

Non-infectious Biological Waste

Waste items that are:

Used labware (tissue culture dishes and flasks, petri dishes, centrifuge tubes, test tubes, pipettes, vials, etc) from clinical or biomedical labs that is NOT contaminated with any of the biological wastes listed in Infectious, Potentially Infectious or R-DNA Biological Waste category above.

Gloves or other disposable personal protective equipment from clinical or biomedical labs that are NOT contaminated with any of the biological wastes listed in Infectious, Potentially Infectious or R-DNA Biological Waste category above.

Unused medical devices.

Blood, blood products, tissues, or items contaminated with these, from animals not known to, or expected to, contain pathogens.

Sharps Waste

Waste instruments that are intended to cut or penetrate skin:

- metal lancets, scalpel blades, needles, or syringe/needle combinations

These must be placed in red, hard plastic sharps boxes, even if unused.

Close the sharps box when it is $\frac{3}{4}$ full and do not store closed sharps boxes for more than 30 days.

Sharps boxes are placed into the red bag-lined cardboard biological waste box for disposal.

If contaminated with infectious, potentially infectious, or rDNA, the sharps box must be autoclaved before disposal.

Biological waste items that can cut, but are not intended to do so (fragile glass, glass slides and cover slips, razor blades, pipettes and pipette tips), should be disposed of in a manner that prevents harm. Use:

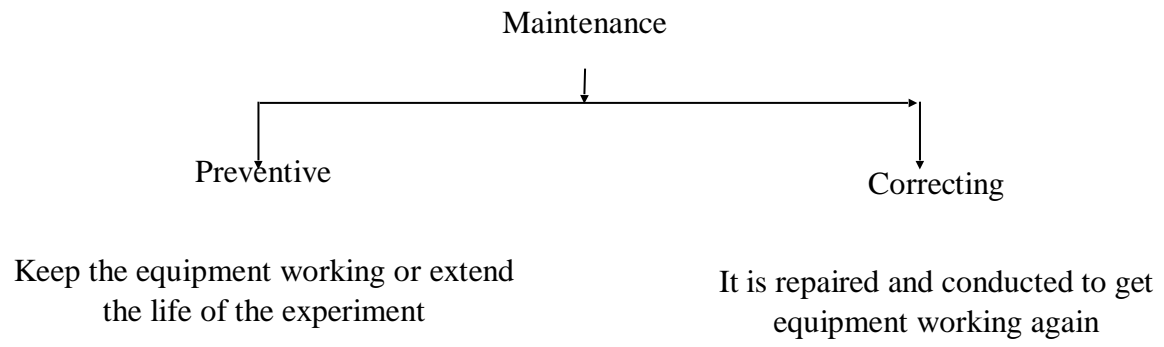
- Sharps Box
- (smaller) rigid box that is then placed in a biohazard bag
- plastic sleeve (to hold the pipettes together in a bundle) that is then placed in a biohazard bag

If contaminated with infectious, potentially infectious, or rDNA, the material must be inactivated before disposal.

Maintenance of equipments and instruments: Maintenance is a periodic activity carried out either on scheduled data or whenever instrument starts deviating from its normal behavior

- The quality and efficiency of medical service provided in any hospital depends on proper functioning of equipments and instruments used by doctors and other clinical staff – proper care, maintenance, timely repair is very much important for the maintenance of the instruments
- in order for the doctors to monitor and treat abnormal condition of the patients, they would always need instruments, tools, materials to be reused and these reused medical equipments or devices need to be sterilized or cleaned immediately in order to use them again
- the instruments used by doctors are exposed to different pathogens coming from the patients to reduce to eliminate the blood or other pathogenic microorganism that often cause cross contamination. So it must be cleaned immediately and must ensure they are delivering accurate information.

General Requirements for Maintenance: Obtaining a copy of the maintenance schedule from the manufacturer – ensuring that maintenance is performed as required – retaining records of maintenance – set up a system for removal and tagging of damaged or defective equipments and instruments – Maintenance must be done in proper conditions – Maintenance includes tests, measurements, adjustments and replacement of the parts of the instruments – Subgroups of the maintenance of equipments and instruments



Successful maintenance program includes: Well organized schedule – controlling hazards – defines operational procedure clearly and training of the clinical staffs to handle the equipments.

Different steps for maintaining the equipments instruments

- 1. Rinsing:** After surgery a use of the instruments, the instruments are rinsed under warm water.
- 2. Cleaning:** The equipments are submerged in a solution of water and neutral pH 7 detergent.
 - a) Ultrasonic cleaning:** Processed in a cleaner for 5 to 10 min, ultrasonic cleaning solution is used.
 - b) Automatic washer sterilizer:** Lubrication after last rinse cycle and before sterilization cycle.
 - c) Manual cleaning:** Most commonly preferable.
- 3. After cleaning:** Let them air dry and stored in clean and dry environment.
- 4. Auto claving:** Lubrication is done using instrument with lubricant – The instruments are either autoclaved in sets or individually
- 5. Cold sterilization:** Most cold sterilization solutions render instruments sterile only after 10 hours of immersion – maintenance of these instruments need to be managed in following ways.
 - 1. Work order management:** Maintenance of history records of the instruments.
 - 2. Data quality management:** Accuracy of clinical and biomedical engineered data must be maintained – It must establish basic, accurate and maintenance automated records.
 - 3. Personnel Management:** Biomedical managers should assign staffs for the right job.
 - 4. Quality assurance:** Identify a supply of a equipment as being defective – Quality of the instruments lessens the risk of patients and also the staffs.
 - 5. Patient safety:** Important goal of every health care provide is the safety of the patients.
 - 6. Risk management:** It is to minimize liability of mishaps and accidents and stay compliant with regulatory reporting requirements.
 - 7. Hospital safety programs:** Safety includes a range of hazards including mishaps, injuries

and patient care hazards. The program includes: - Patient safety – environmental care – space utilization committee – equipments review board – infection control

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UNIT– IV

PART – A

1	What are dietary services?
2	What is medical record?
3	Briefly explain House-keeping services in hospitals. .
4	List the different forms of medical records
5	List out fire responsibilities of medical records committee.
6	Write short notes on responsibility of nursing services towards patient care.
7	What are the responsibilities of medical record officer?
8	List out the factors that promote quality assurance.
9	List out the prophylactic measures of hospital infections.
10	What is nasocomial infection?

PART – B

1	Explain the importance of dietary service in hospital management.
2	Discuss the process of selection and post selection for developing quality hospital personnel.
3	Define Hospital records. Explain the different types of hospital records.
4	What is staffing? Explain the different types of staffing in hospital.
5	Discuss the duties and responsibilities of staff nurse.
6	Explain the importance of medical care in hospitals.
7	Write a note on Hospital infections and its prevention of hospital infections.
8	Brief on the responsibility of nursing services towards patient care.
9	Write a detail note on different types of sterilization
10	Discuss the role of dietician in patient care.

UNIT – V – Hospital Management – SBMA3009

UNIT V SUPPORTIVE SERVICES IN HOSPITAL

Organization of Nursing services

INTRODUCTION:-

Nursing profession is considered a caring profession to begin with, it was an art and a vocation. Now it is considered a scientific profession nursing care is defined as the care of the patient with regard to nursing needs, with the ever increasing dimension of medical sciences quantitatively and qualitatively nursing care is becoming more and more complex with its management services.

Nursing Services:-

Nursing service is the part of the total health organization which aims at satisfying the nursing needs of the patients/community. In nursing services, the nurse works with the members of allied disciplines such as dietetics, medical social service, pharmacy etc. in supplying a comprehensive program of patient care in the hospital.

Definition of Nursing Services:-

WHO expert committee on nursing defines the nursing services as the part of the total health organization which aims to satisfy major objective of the nursing services is to provide prevention of disease and promotion of health.

OBJECTIVE OF NURSING IN WARD:-

- Maximum comfort and happiness by way of pleasant surroundings.
- Qualitative/comprehensive care to the patient.
- Care based on the patient's needs.
- Accurate assessment of illness.
- Adequate material resources at all times.
- Health education to the patient and attendants.
- Managerial skills as and when required.
- Privacy at all levels.

EFFECTIVE NURSING:-

An effective nursing is always based on nursing process which is an organized and systematic approach to nursing care, that prioritizes patient assessment and management.

Entire nursing process consists of four phases:-

- **ASSESSMENT**- not only initial but integral ongoing component of the whole nursing process.
- **PLANNING AND IMPLEMENTATION**- in this the nurse formulates and implements the care.
- **EVALUATION**- decides whether the action taken has met the identified needs or not. This is the final step of care. Also, review of the whole care plan. Without this no quality care or comprehensive care is possible to provide.

FACTORS TO BE CONSIDERED IN PLANNING HOSPITAL NURSING SERVICES:-

- Number and type of patient.
- Number of beds and type of ward.
- The services required.
- Procedures/techniques necessary for care.
- Number and type of personnel needed to perform care effectively.
- Physical facilities.
- Provision of equipment and supplies.

S.I.U NORMS:-

- 1 Nursing sister for 3:6 staff nurses.
- 1 ANS for 4:5 nursing sisters.
- 1 DNS for 7:5 ANS.
- 1 Nursing supdt for 250-500 beds.
- 1 CNO for 500 or more beds.

PROBLEMS AND CHALLENGES FACED BY THE NURSING ADMINISTRATOR:-

- Lack of adequate training.
- Problem of personnel management.
- Inadequate number of nursing staff.
- Shortage of trained manpower.
- Lack of motivation.
- No involvement in planning.
- No career mobility.
- Poor role model.
- Non-nursing activities.
- No research scope.
- No proper authority.
- Professional risk/hazards.
- No autonomy in nursing activities.

CONSTRAINTS AND BARRIERS IN NURSING SERVICES ADMINISTRATION:-

- Planning of nursing manpower.
- Management and development.
- Staff development.
- Development/awards.
- Nursing legislation.
- Trained nurse managers.
- Diversification in nursing profession.
- Leadership inadequacy.
- Lack of strength, weakness, opportunity and threat.
- Lack of awareness to meet social, economic and technical changes in the society and consumer protection act.
- Lack of communication.
- Nursing care audit.

DAY TO DAY PROBLEM IN NURSING SERVICES:-

- Shortage of nurses.
- Lack of motivation.
- Negative attitude.
- Lack of training.
- Lack of team approach.
- Inactive participation of programs.
- Lack of I.P.R.
- Less involvement in patients care by the nursing supervisors.
- Lack of supervision.

FORSEEN FOR BETTER NURSING SERVICE ADMINISTRATION IN THE NEXT MILLENNIUM:-

- Accountability.
- Autonomy of professional activities.
- Awareness of C.P.A.
- Independent nursing practices.
- Renewal of licenses based on education and examination.
- Specialty nursing
- Nursing care audit.
- Qualitative nursing care.
- Separate nursing budget.
- Diploma in nursing management.
- Nursing research .

Organization and Management of Dietary Services in a Hospital

Dietary service in a hospital is an important component of patient care. In India, however, the hospital food service has not been given attention it deserves. The kitchens of the district and other government run hospitals merit immediate attention and every effort should be made to improve them. They lack infra structural facilities and staff and in most places are inadequately supervised.

Space Requirements for a Dietary Service: The kitchen is broadly divided into the following functional areas:

- Supplies receiving area
- Storage area
- Cooking area
- Utensils washing area
- Garbage disposal
- LPG stove and refrigeration facilities
- House keeping
- Dietician's office
- Stewards office
- Circulating office

The following are the space requirements recommended for hospitals of different sizes.

- 200 beds or less – 20 sq.ft. per bed.
- 200-400 beds – 16 sq. ft. per bed.
- 500 beds and above – 15 sq. ft. per bed.

Staff Requirements: The staff requirement of the dietary services department for various hospitals is shown below. An additional 10-30% staff will be required to compensate for weekly offs, casual leave, earned leave etc.

Functions of Dietician and other StaffAdministrative

Establishment of department policies regarding the indent, selection and purchase, storage and issue of ration, preparation and distribution of food.

Establishment and supervision of adequate records and supervision of record keeping like purchase records, records of stock and records pertaining to various stores, equipment and finances.

- Planning of menu
- Budget planning
- Cost accounting
- Condemnation of equipment
- House keeping and sanitation
- General supervision of personnel working in the department.

General Food services

Matters concerning work schedules, uniforms, safety, time-schedule for serving the food to patients etc.

Adequate control of pests and vermin.

In-service training program for class IV employees.

Clinical functions

Dietician by virtue of his knowledge of principles of dietetics and nutrition serves an important function in planning a proper diet for the patient. Taking into consideration the specific needs of different patients, he offers dietary advice. He also guides the out patients especially those attending the speciality clinics like:

Pediatric nutrition clinic on daily basis

Juvenile diabetic clinic

Diabetic clinic

Cardiac clinic

Nephrotic syndrome clinic

Dietetic instructions clinic of OPD.

Educational functions

The dieticians are involved in training of students of dietetics and in imparting training nurses and other paramedical workers on various aspects of dietetics.

Functions of Stewards

- To receive diet sheets from the different wards and prepare a consolidated demand.
- To maintain records of all correspondence, regarding the diet sheets, indents of the diet, and census etc.
- To carry out daily inspection of kitchen staff for appearance, cleanliness and uniforms etc.
- To take measures to ensure proper utilization of the rations issued for cooking.
- To monitor the equipment used in the section.
- To supervise distribution of food to patients in the wards.
- To supervise proper handling and disposal of garbage.
- General sanitation of the kitchen area, with special reference to the washing area and toilets.
- To visit wards along with the dietician, to look into the complaints regarding the diets.
- Any other duty assigned by senior dietician from time to time.

Functions of storekeeper

- To receive all goods indented for the kitchen and sign various receipts, subject to the approval of the dietician.
- To verify, the stores accounts including LPG cylinders, received by head cook, in his absence.
- To place the goods in proper place like shelves, bins and other suitable places.
- To maintain the store room in a clean and orderly manner.
- To issue supplies according to the indents.
- Checking and verifying the bills and submitting them to dietician in-charge.
- To keep records and stock books up to date.

Any other duty assigned from time to time by the senior dietician.

Functions of Head cook

- Care and maintenance of equipment.
- Cleanliness and sanitation of the kitchen area.
- Opening and closing of the kitchen.
- Maintenance and improvement of standards of food preparation and services.
- To receive supplies like milk etc when store keeper is not available.
- To represent to the chief dietician, grievances of kitchen staff, if any.
- To report about LPG cylinders to store keeper.
- To ensure supply of meals, at the specified time, to in-patients of the hospital.
- To exercise special care regarding the therapeutic or special diets in the kitchen.

Duties of other Staff like Khidmatgars, Bearers and Mates

- Carrying food from the kitchen to the wards in trolleys and obtain a receipt for the supplies made.
- Use clean and proper utensils for transporting food, milk, tea to the various wards.
- To help cooks in cleaning, washing and cutting of vegetables and cleaning of rice and pulses.
- To help the store keeper in weighing of the rations for the day.

Functions of Masalchis

- Transfer of soiled utensils from kitchen to dish washing area.
- Thorough scrapping and washing pots and pans.
- Use of proper detergents and methods for cleaning, as per instructions.

Dietary Stores Management

An internal purchase committee consisting of 3 or 4 members will be nominated by the hospital management. The senior dietician will be the member secretary. This will serve as a watch-dog to monitor the stores management in the kitchen. The functions of the committee are:

Check the various supplies received in the kitchen are supplied, as per the specifications.

The members, other than dietician should visit the kitchen stores at least 2 or 3 times a week. This will ensure orderly upkeep of the stores by streamlining the procedures and facilitate regular and timely procurement of food stuffs and in easing the bottlenecks in procurement. The quality inspections, reduction in wastage, maintenance of discipline in the section, preparation and distribution of food, complaints and settlement, Pilferage reduction are some of the aspects that need strengthening.

The supplies to the kitchen include, perishable items like milk, butter, breads, eggs, vegetables, fruits and non perishable items like rice, pulses, oils, utensils etc. The perishable items can be received by the head cook or stewards when store keeper is not available.

A surprise rounds committee, consisting of three senior medical staff, can be appointed by the medical superintendent to conduct surprise checks of the stock position and quality of the material in the kitchen stores.

Purchase

Purchase of both perishable and non-perishable items needed for the kitchen stores should be purchased from a reputed supplier like government or co-operative stores.

Supply of Orders

The dietician places orders, for procurement of supplies for the kitchen, depending on the demand. Usually, the purchase order is for a period of one month. As the supplies are received, entries must be made in the relevant stock register.

Storage and Distribution

The storage of non-perishable items is possible in the hospital kitchen stores. There should be a store room with adequate lighting and space for storing items like rice, pulses, atta etc. There should be provision to avoid damage to items by moisture.

There should be an arrangement for regular supply of perishable items. Items like butter, cheese, eggs etc. can be stored in a deep freezer to avoid any damage. Stock books should be maintained by store keeper and daily entries should be posted after issue of items to the cooks. The items are issued only against proper indents placed by the stewards and a record of indents is maintained by the store keeper.

It is always advisable to maintain a buffer stock to last for a week in the kitchen stores. The stock position should be closely monitored by the store keeper and the dietician and satisfactory stock position should always be ensured.

Quality Control

Quality control will not pose a serious problem if supplies are obtained from suppliers

recognized by government or government agencies. Any sub-standard material received, should be returned to the suppliers.

Housekeeping and Maintenance Services

Housekeeping and Maintenance services of a hospital include

- Laundry
- Boiler house
- Incinerator
- Workshops
- Mortuary

Laundry

Laundry arrangements are very important from the point of view of controlling infections. The hospital generates a lot of linen which is soiled and infected by patients' blood, body fluids, secretions oozing out from the wounds etc. The dirty linen generated in the Operation Theatre, wards and other areas like labor rooms is potentially infective, unless properly handled. Even the ordinary linen like bed sheets, pillow covers from the wards may be a source of serious danger and hence should be handled with due care and precautions.

In view of this, majority of the hospitals establish their own laundry. However, it may be economical to operate a common laundry services for a group of institutions in the area, since a lot of saving can be effected in terms of money spent on building, equipping and maintaining the laundry services. If a common facility is shared by the hospitals, the dirty linen should be stored in a linen room, where it is sorted out and is sent to the laundry. The clean linen received from the laundry, is stored in the linen stores.

Guidelines for Handling the Linen

The dirty and clean linen should always be kept separately, both in the linen room and laundry.

The ordinary soiled linen should be kept in strong canvas bags at the point of origin. The bags when full, tied up and sent to the laundry.

The heavy infected material should be kept in the metal buckets or drums with a tight fitting lid, soaked in a disinfectant solution, until they are transported to laundry.

The linen received in the laundry or linen room should be rendered reasonably safe for further handling.

The linen which is likely to be dangerous should be immediately passed through a modern washing machine and laundered. The linen, so processed, should be safe for the staff, who subsequently handle it to count, sort and dispatch to the laundry.

The linen after laundering will be transferred to a “clean” section of the linen room for sorting and dispatch to the points for use.

The linen is generally maintained in the wards under the charge of staff nurse. In a system of centralized stores and supply, as practiced in certain institutions, the different units receive their supply at regular interval viz. Daily or twice or thrice a week. The responsibility of maintenance of the stores lies with the central stores. This department is responsible for collection and transport of used material, and replenishment of the items used. This department is responsible for protection against loss of the stock.

Boiler House

In cold and temperate climate, a central boiler house should be established to provide central heating to the buildings. The boiler house should be designed after taking engineering advice regarding the requirements and design. The steam is necessary for areas in hospital for sterilization purposes. However, with the advent of C.S.S.D. no sterilization procedures are carried out separately. Hence, there is no need for supplying steam through pipelines, as was practice before.

However, the steam is required mostly in the laundry, C.S.S. Department and kitchen. In view of this, it is ideal to locate these departments close to the boiler house.

Incinerator

An incinerator must be provided to dispose off the hospital waste and this should be located in relation to the prevailing wind. At present, in view of the awareness of the environmental preservation, it is essential to provide for proper disposal of biological and other combustible waste.

Workshops

The hospitals have different types of equipment and buildings, which need maintenance. In view of this, the hospitals should establish workshops, manned by trained personnel. This will help in avoiding avoidable expenditure in terms of transport of equipment for service, and losses incurred during the time when instruments and equipment remain idle.

Mortuary

The disposal of the dead depends on the religious, social and cultural practices of the society. It is essential to provide a place for keeping the dead body, before it is removed for cremation or burial, by some exit, away from the view of the patients and others in the hospital.

The requirements for provision of mortuary vary with the climate and local custom. Mortuary with facilities for cold storage to keep the dead bodies and room for carrying out postmortems is usually provided in the hospitals. Postmortem rate i.e. percentage of bodies subjected to autopsy is considered as one of the important indices of hospital efficiency. Two postmortem rooms will

be adequate for a hospital with bed strength of 500-600.

Medical Records

The medical records constitute a vital component of hospital care. These are not static and need keep pace with the dynamic changes occurring during the evolution of the present day hospitals. These are records pertaining to the clinical and administrative activities pertaining to patient care, which provide the panoramic view of the progress of medical and scientific progress.

As many other factors like social, psychological and emotional factors come into play, the medical records cannot be maintained with the precision and specificity of statistician or engineer.

However, maintenance of medical records is essential as it provides an effective means of communication about the patient care within and between hospitals. The importance of maintaining such records does not vary with the size or the type of the service rendered by the hospital.

What is a Medical Record?

Medical Record is a clinical, scientific, administrative and legal document where sufficient data about the patient care is recorded in a chronological order, to justify the diagnosis, treatment and the results. Thus, it contains details about the condition of the patient, recorded by trained observers, findings of their examination, results of relevant investigations carried out, therapeutic measures instituted and the results of such measures.

This record helps to evaluate whether the efforts of the doctors supplemented by the ancillary staff are within the acceptable standards in practice at any given time.

Purpose of Medical Records

The primary purpose of maintaining medical records is to improve the quality of the patient care. This serves as record of illness, however minor it may be, as it is impossible for anyone to remember all these details and recall at a later date. So a written document where in all the details are chronicled will be an evidence to prove that the patient is handled in a scientific, intelligent and systematic manner as warranted.

Medical Records and Patient

It serves to document to study of the patient, and various activities undertaken in this behalf.

It serves to prevent omission or unnecessary repetition of diagnostic procedures and treatment.

It serves to provide continuity of treatment in case of future illness, in the same or other hospital.

It also serves as evidence in Medico-legal cases and in case where disputes arise between the patient and the hospital especially in the present era of consumer protection.

It furnished necessary information to insurance companies, contributory health schemes in arriving at the quantum of assistance to be provided and also for employment purposes.

Medical Records and Doctors

The medical record serves as an assurance of the quality, quantity and adequacy of the various diagnostic and therapeutic measures undertaken by the doctor.

It ensures an orderly continuity of medical care provided to the patient. It

helps in evaluation of the medical practices adopted.

It is an important tool in medical research and also in providing continuing education for health professionals.

It provides protection against malpraxis suits and also in medico-legal cases.

Medical Records and Hospital

The medical record is necessary for the hospital.

To evaluate the type, quality and quantum of work undertaken and accomplished. To

furnish proof of the type and quality of service provided to the patient.

To evaluate the proficiency of the individual doctors with regard to clinical and administrative capabilities.

To evaluate the services rendered by the institution in relation to the accepted norms and standards in vogue.

To protect the hospital in case of medico-legal problems as in case of suits filed by the patients for recovery of damage for purported negligence.

To plan the future activities to expand or discontinue any types of services already being rendered, or to introduce new facilities keeping in view the necessity.

To plan and carry out research programs relevant to patient care.

To assess the staffing needs and also to assess the performance of the hospital personnel.

For preparation of the budget and justification for the provision and utilization or

augmentation of the physical facilities.

To provide statistical data which forms the basis for administrative use and evaluation and to plan future activities.

To assess the need for equipment and supplies.

To provide pertinent data to public health authorities to enable them to undertake necessary control and preventive measures, especially when epidemics of infective diseases like gastroenteritis, cholera, hepatitis etc. occur.

Ownership – Privileges – Rights Pertaining to Medical Records

The medical record is a medico-administrative instrument, in which there are recorded observations, in chronological order, by qualified and trained personnel, about the status of the patient, investigative and therapeutic measures undertaken and the result of such measures.

Policies Related to Medical Records

In view of the importance of the medical records, the hospitals should lay down definite policy pertaining to the medical records.

Medical Records Committee

A medical records committee comprising of the representatives from the following can develop the policies pertaining to medical records:

Medical Staff

Nursing Services

Medical Records division and

Administrator

Responsibilities of M.R.O.

The medical records officer is responsible for:

Formulating policies pertaining to the maintenance and utilization of medical records in consultation with the heads of the various departments.

To design the clinical records and report forms of various departments, including the monthly and annual statistical reports.

To assist in determination of system and procedures.

To revise and modify existing systems and procedures to be used in order to improve the quality of services rendered by the hospital.

To maintain the medical records as per the accepted system of indexing.

To develop and maintain a good filing system.

To assist in determination of the number and types of reports to be submitted.

To assist in devising methods to ensure completion of medical records.

To assist in educating the medical personnel in the use of accepted system.

To assist in conduct of the medical audits and statistical analysis in an efficient manner by ensuring proper maintenance of medical records.

To supervise and train the subordinate staff in medical records keeping. To

check medical records for deficiencies if any and to get them rectified.

To compute the statistics for the whole hospital, for each service and the doctors such as – Admissions, discharges, Births & deaths, Mortality rate, Total hospital days, Average length of stay, Percentage occupancy, Autopsy rates, consultations and complications.

Medical Records Committee – Composition, Tenure and Functions

The important functions of the committee are:

To furnish guidance to the medical records department in ascertaining maintenance of high quality patient care.

To ensure high quality of professional education, scientific research.

To meet the standards and providing the basis for legal protection of the patient, staff and hospital.

The committee meets at least once a month to carry out its functions.

The minutes of meetings should be kept and should be signed by the chairman of the committee.

All hospital records of patients discharged after the last meeting of the committee must be made available to the committee.

The committee will review random samples of case records for completeness, adequacy of measures undertaken – both diagnostic and therapeutic.

The members of the committee will not review their own case records.

The name of doctors with delinquent and deficient case records must be conveyed to the executive committee for necessary action.

Qualifications of the Medical Records Officer/Librarian

The medical records librarian or officer must possess a qualification in Medical Records Science. This course is offered at some centers like Christian Medical College, Vellore. The duration of the course is one year. The training includes basics of Anatomy, Physiology, Pathology & Forensic medicine. The course covers with medical terminology, classification of diseases and procedures in medicine, Hospital administration, Bio-statistics, Medical records science and computer applications.

The medical records assistant course is also offered at these institutions and the duration of the course six months.

The staff requirement for medical records division is as follows: 1) Medical Records Officer, 2) Medical Records Assistant/ technician, 3) Record clerks for filing, referral, registration, indexing etc, 4) Software specialist/ programmer.

Staffing the Hospital

The strength of any institution is the personnel employed in it. The hospital is a service organization, catering to the public. The hospital staff comprises of medical staff, paramedical staff and non medical staff.

The staffing of the hospital is of utmost importance for the successful realization of the objectives of the institution. The staff should be qualified, adequate to meet the work load and above all dedicated to the cause. Besides the staff operating from within the hospital, careful consideration must be given to those working in the community around the hospital, in preventive and other community health services.

Medical Staff

The medical staff of the hospital should preferably be organized into a well knit teams. This is more important in service like surgery and allied specialties, Medicine and Obstetrics and Gynecology. The team should consist of a senior specialist physician or surgeon, assisted by an experienced assistant and one or two newly qualified assistants. All these staff working full time, can look after about sixty beds. If the teaching responsibilities also included in the duties, the staff strength should be augmented or the number of beds allotted to the team must be reduced.

In many of the corporate hospitals, the junior medical staff are appointed on full time basis. The consultants may be appointed on full time basis or visit hospitals in a particular time of the day. In the latter case, it is advisable to clearly define the times and periods of attendance in the hospital, so that their private work will not interfere with the hospital duty.

The staffing of the departments is based on two types of systems in vogue.

The parallel system where all the members of a department are treated as equal and each will follow his own line of practice without much reference to others.

The hierarchical system. In this system, the head of the department is concerned with only formulating the broad guidelines of practice, in consultation with the colleagues. He will not interfere in detailed handling of the patients by the colleagues.

In some of the departments like pathology, microbiology, biochemistry, radiology, obstetrics, a head is necessary, as these departments are entrusted with the training of paramedical personnel.

The hierarchical system of the staffing of all departments is recommended for the developing countries.

In majority of countries, the medical staff tend to congregate in and around cities and towns and do not show interest in working in rural areas. To overcome this difficulty, suitable financial inducements must be provided to the medical and other staff.

Nursing Staff

The importance of good nursing service has to be kept in mind while planning for recruitment of staff for hospitals. In absence of good nursing care, the expertise of the medical staff cannot be utilized properly. The nursing staff are responsible for carrying out the instructions given by the attending clinicians. Therefore, appointment of adequate, well qualified nursing staff is essential.

The organization and functions of nursing department are discussed in details under appropriate chapter, elsewhere in this book and not included here again.

Medico-Social Workers

The role of social and domestic difficulties in causation of the illness, is well recognized. Hence, a medico-social department comprising of trained, qualified medico- social workers, who will collaborate with the clinicians, should be established in all hospitals. The staffing of this department can be determined according to the size of the hospital. In a hospital with about 500 or more beds it is essential to have several medico-social workers assisted by clerical assistants, to counsel the patients. The demand for qualified, trained, dedicated social workers is much in excess of the demand.

The medico-social worker has basic training in social sciences and by virtue of the nature of her work in the hospital, she should have the knowledge of the local customs, traditions and general mode of life of people in the community served by the hospital. This will enable her to establish good relations with the public in the community and will enable her to carry out her public health activities successfully.

Physiotherapists and Occupational Therapists

With the shift of emphasis from curative through preventive to rehabilitative medicine, the appointment of qualified physiotherapists and occupational therapists is essential. The

services of these specialists are utilized to improve the quality of life of patients recovering from diseases, which result in handicap. The organization, staffing and functions of the physical medicine are discussed in detail under appropriate head in the book elsewhere.

Pharmacists

The department of pharmacy is usually headed by a chief pharmacist, who will be assisted by pharmacists. The number of staff required will depend on the work load and timings of the hospital pharmacy. The hospital pharmacies are now concerned with procurement, stocking and issuing of drugs and medicine available in the market. The practice of dispensing prescription and preparing of intra venous fluids for infusion is now on the wane.

The pharmacists are responsible for keeping the stock books and registers prescribed by the laws of the country, with regard to addiction producing drugs like narcotic drugs and certified poisons.

Radiographers

The chief radiographer is responsible for the smooth working of the radiology department and for maintaining the registers, for ordering, checking and safe custody of the films and reagents. He will be functioning under the direct supervision of the radiologist. Ordering for costly equipment is the responsibility of the radiologist. Radiographer, under the radiologist is responsible for the equipment and instruments in the radiology department.

Dieticians and Catering Officers

These are also involved in patient care. The organization and functions of dietary services are dealt within detail in a separate chapter.

Medical Records Officer

The details of the qualifications, responsibilities and functions of M.R.O. are included in the discussion on medical records office.

FINANCING HEALTH SERVICES – RESOURCE MOBILIZATION

Introduction

This chapter deals with management of resources especially – finances – Finance management is a very important aspect of hospital administration. The hospital administration is responsible for efficient management of resources. It is his duty to wisely utilize the funds available to the hospital to provide patient services – the should maintain a balance between the expenditures and income of the hospital. The main objective of the financing health services is to provide the best services to the patient at minimal cost.

Financial Resources of Hospitals

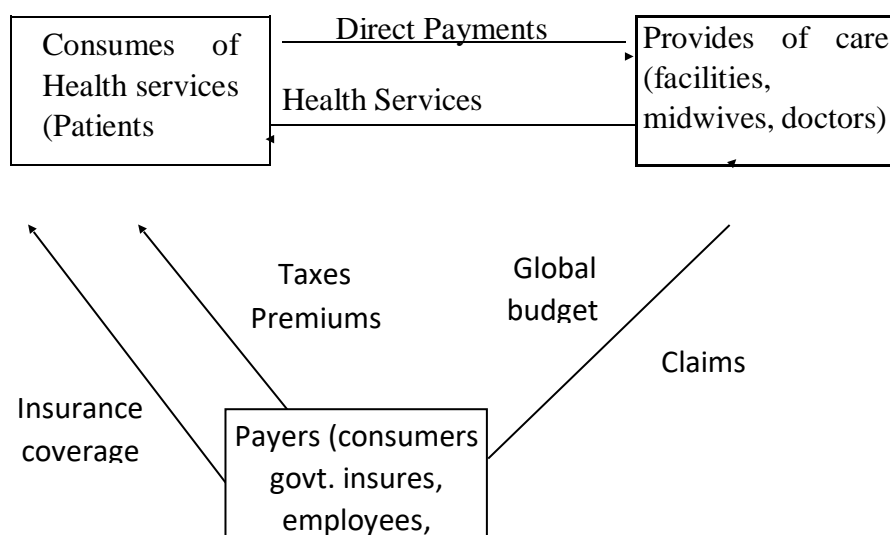
Method of financing depends on the type of ownership

- i) In hospitals run by government, municipalities and local bodies – funds generated by levying taxes – grants from govt. or non-govt. agencies (usually fees are services provided as very little)
- ii) In private hospitals – services provided for a fee. Non-profit voluntary org – fee collected will be less – corporate hospitals and nursing homes – run for profit, fee is higher – Other sources – donations from philanthropic organizations.

Role of Department Head

- Department portion of the budget
- Analysis of the financial as well as statistical data generated by his department.
- Critical analysis of the operations and performance of the department.
- Review and assessment of departmental operations in relation to the overall plan of the hospital
- Monitoring the income and expenditure of his department.

Health Financing System



Financing flows in health system

Budgeting

- Financial plan
- It means operating within a time frame
- Serves as a guide and provides stability to the activities of the institution.

The budget provides for

- Quantitative expression of plans of the hospital
- Evaluation of financial performance in accordance with the plans
- Control of costs
- Budget should be prepared well in advance
- Participation and cooperation of all concerned departments is essential for preparation of a good budget.

Types of Budget

- Appropriation of budget
- Forecast type budget
- Flexible budget

Appropriation budget

- Implemented in government hospitals
- Provides a certain level, cannot be exceeded.
- Extra expenditure – supplementary appropriation budget should be made available

Forecast and flexible budgets

- The degree of flexibility is maximum classified as (i) the operating budget (ii) the capital budget.

Operating budget

- Statistical data is essential.
- Depends on the volume of work
- Depends on charges levied for different services rendered
- Income generated by patient services

Operating expenditure forecast

This consists of different components like (a) salary and wages (b) supplies (c) utilities (d) maintenance expenditure – Salaries to be fixed depending on the qualification, experience

and skills – Supplier – indicates different department requirements – utilities – they are of high expenditure so it should be known before hand – Maintenance expenditure – these are the expenses induced for equipments, buildings, vehicles, machinery which needs periodical maintenance.

Capital Budget

- Funds required for expenditure on capital or non-recurring items
- Provision of new facilities and growth
- Replacement of obsolete, worn out equipments, furniture and machinery
- New facilities like new buildings, plant, machinery or equipment.

Cash Budget

- Cash planning is essential part of managing finances of the hospital
- There should be sufficient cash for meeting the requirements.

The hospitals also earns revenue from other sources like interest on investments (share) from different organizations.

Categories of Expenditure

1) Capital Vs Recurrent

- They are initial one-time investments to provide a particular service
- These expenses include cost of the buildings, equipment, instruments, fixtures and furnitures.
- Recurrent costs – expenses incurred on continuous or periodical basis. Eg water, electricity, chemicals, reagents.

2) Fixed vs Variable

- Fixed Costs – These are expenses incurred irrespective of the work load.
- If fixed costs are high then number of procedures or operations should be increased.

3) Direct vs Indirect

- Direct costs can be linked directly to a particular activity

- Indirect costs are those expenses incurred but not linked to a particular procedure.

Factors affecting the hospital expenditure

- **Size of the Hospital:** Expenses incurred in providing the patient care is proportional to the size, range and comprehensiveness of the services incurred. The larger the size, greater the range and services, the cost per patient day will be higher.
- **Volume of activity:** If the patient no is more, mere staffs should be appointed and increase in the procedures that is to be carried out.
- **Competition:** The charges of the hospitals of the same area are compared, also the services, More the better services more income will there for the hospital.
- **Service Interesting:** Expenditure in the form of sophisticated and costly equipments, expensive procedures, requirements of more skilled staff.
- **Degree of Investment:** Higher capital and fixed costs results in higher operating costs.
- **Efficiency:** The materials should be used in an efficient and economic manner. Operations should be cost effective.
- **Hospital Design and Layout:** Architecture, location, layout, building material and type of facilities provided, number of staff employed, work flow govern the expenditure of the hospital.
- **Reimbursement pattern:** Health Insurance, companies is another factor responsible for rise in the cost of patient services.
- **Expenditure containment strategies:** i) Cost awareness, ii) Cost monitoring, iii) Cost management.
- **i) Cost Awareness:** The hospital staff must be sensitized to the cost involved in providing the services and how to maintain them.
- **ii) Cost monitoring:** On going process, to identify, report and analyze actual expenditure in relation to budget projections. If variations occur, corrective steps should be initiated.
- **iii) Cost management:** It is essential to establish the accountability and responsibility system for communicating, controlling the plans and strategies (expenditure). Income should compromise the quality of patient care.

Management assisted by computers: Reservation, Admission, Registration and Discharge Module

Objective: The program is intended to enable financial manager & controllers to spend more productive time and resources in planning for their operations and implementation more strategically, than on routine record keeping and procedural compliance – All the conclusion of this program participants will be able to :

- Use computers to perform financial forecasting activities faster and more effectively.
- Use compute to perform financial modeling and planning so as to facilitate timely – decision making.
- Use and apply relevant computer based financial management packages applicable at their workplace cost effectively.

Contents

- Scope and environment of financial management.
- Computer assisted financial analysis, modeling, budgeting, cash flow analysis, asset valuation, capital investment
- Planning and developing financial information systems
- Survey of financial software packages
- Applications of computer networks and interest
- Database systems and e-commerce applications.

Target group

- The program is targeted at middle level managers, financial accountants, controllers and internal auditors of business organisations. Prior exposure to information technology is necessary.
- The ADT module helps the user to create a complete record at all patients including their personal and medical details.

The patient can make an appointment with the hospital, yet registered with specific details and get a unique patient ID no. (once assigned, remains a permanent reference no for the patient) and unique visit ID no. for the patient (changes with each visit of the patient).

After routine registration details have been entered in the system, patients socio demographic profile like patients name, patients ID no. visit ID no. age and sex are displayed on the title at every screen.

APT facilitated bed reservation, admission and transfer, subject to availability and other factors like routine discharge, house keeping etc. specific to defined reference criteria.

- i) Admission scheduling
- ii) Bed allocation
- iii) Revisit scheduling
- iv) Service ordering
- v) Viewing of stay informations for a patient.

Transfer

- i) Ability to transfer patients between beds, wards and nursing stations.
- ii) Transfer of consulting physicians to a patient

Discharges

- i) Discharge of patient and discharge summary edition.

Hospital Management System Module Admission, Registration and Discharge

ADT: The ADT module deals primarily with patient appointment, registration, admission, discharge and transfer.

Patient registration

- i) Provides access to all patient registration procedures – normal, revisits and emergency.
- ii) Patient identification no.
- iii) Patient demographic details
- iv) Assigning of physicians to a patient
- v) OP visit / appointment scheduling.

Admission

- i) Includes scheduled and emergency admission and patient inquiries
- ii) Enter and update admissions and demographic data into the system.

Continuation of Hospital Management System Module

- The billing module deals with hospital services and associated billing charges
- It includes billing of outpatients and inpatients for registration, services, hotel occupancy, pharmacy, material if cures, blood bank, operation theatre, diet ambulance among others.
- Financial clearances required at various stages for availing hospital services / facilities and also to be handled by the billing module.
- Billing module, helps hospital to manage corporate, insurance and hospital insurance accounts, and the patients in each category subject to contract specifications.

Blood bank

- Blood bank module helps in managing blood inventory, blood, order donor / receiver information, recording blood test results and testing and cross matching of blood units in the hospital blood bank

Operation Theatre (OT)

- The OT module allows the user to process and monitor OT data and services.
- This module processes schedulable and non-schedulable orders and provides the functionality of the substores module
- The user can process the service schedules carried out in various OT points.
- The OT module also monitors the consumption of pharmacy / material items and maintains pre and post operation notes.
- In addition OT supports, recording of anaesthesia notes, OT checklist, ward check list etc.

Consultation

- The module allows the user to view details of a patients such as the actual examination of the patients by the doctor, regarding of history, and findings of physical examination.
- Using the clinical documentation feature integrated with this module, doctors can process and report clinical record and treatments details.
- The consulting doctor can make a request for admission for an outpatient using this module.

Medical Records Index Module

Medical records constitute a vital component of hospital health care.

This is essential as it provides an effective means of communication about the patient care within and between hospital.

Definition: Medical record is a clinical, scientific administrative and legal document where sufficient data about patient care is recorded.

Main uses of Medical Records

- i) **Use of Medical Records and Patient:** It serves to document the study of patient and various activities undertaken – if serves to prevent omission on unnecessary repetition of diagnostic procedures and treatment – if provides continuity of the treatment for future illness – It also serves as evidence in Medical legal cases, (in case any dispute arise between patient and hospital).
- ii) **Medical Records and doctors:** It provides an assurance of quality, quantity and adequacy of the various diagnostic and therapeutic measures – To communicate between attending doctors and other health care professionals providing care to patients for continuing care of patient – for research of specific diseases and treatment – and for collection of health statistics.

Patients Identification

Correct patients ID enables hospital staff – to find a particular patients record whenever they come to the health care facility – to link patients previous admission or outpatient attendance to the current admission (using medical record number of part) – to find the correct medical record of patients when there are more than one patient with the same name – it would also enable like MRO, to monitor their performance re-train if required.

MRO – Medical Records Officer

He is responsible for – i) to assist in determination of system and procedures – ii) to service and modify the existing system – and procedures in order to improve quality of services – iii) to maintain the medical records as per the accepted system indexing – iv) to develop and maintain a good filing system – to assist medical staff and medical records committee in its activity – to check medical records for deficiencies and to get them rectified.

Procedure for Records

Outpatient: Different types of records are maintained in different hospitals and there is no uniformity in pattern. The outpatient record is initiated when the patient reports to the hospital reception.

- i) An index card of $5\text{ cm} \times 8\text{ cm}$ size prepared showing patient's name, age, sex, OP number, address, date and clinical service to which patient is referred to this card is kept in the active box – The card will be filled in alphabetical order after the clinical record of the patient is returned to records division.
- ii) At the same time outpatient clinical report form will be prepared. This may be in the form of $5\text{ cm} \times 8\text{ cm}$ card or a folder or file with sheets inside.
- iii) The patient is issued an OP card showing his personal data and OP number, which has to be produced at reception counter, so that his record can be retrieved and sent to relevant clinical unit.

Patient Records

The Inpatient (IP) records originate when the patient is advised for admission after examination in OP – the record is initiated by the admissions officer of the hospital whose will be located in OP block – under serial number system the patient is given different number on each admission and the old files brought out and filed together with new / current file – The admitting office, being a part of medical records – division always keeps assembled sets of blank clinical records form for use.

There are 6 simple slips in medical record Index module

1. Separate the record
2. Break each tab of medical records into following subsections.
 - i) Progress notes
 - ii) Nursing notes

- iii) X-rays, MRIs and other radiology reports
 - iv) Lab results and reports
 - v) Referrals and prescriptions
3. Put the records in chronological order with the most recent on top.
 4. Prepare a table of contents for the medical records index
 5. Scan and save complete copy of the organized medical reports on your computer.

Personnel Registration Module

Personnel Registration Module deals with pay calculation, printing of salary slip, salary certificate, PF statements, gratuity statements and provide a monthly analysis – It deals with maintenance of employee biodata, attendance / overtime details – It also reports on absenteeism, leave, encasements etc – The personnel and payroll department is also responsible for employee related details like appointing staff, maintaining the employee database, fixing allowance and deductions, leave sanctions, loan, termination process, maintenance details tenancy contracts and reliable registration.

EMPLOYEE REGISTRATION MODULE

Employee Record

- Adding New Employees
- Finding Employee Information
- Editing an employee record
- Deleting an employee record

This module receives and process information about the employees. It contains the basic information about the employees like attendance, salary, leave summary and all details of loans and reports.

Overtime Register

It is used to mark the number of overtime hours of an employee worked. It can be adjusted any time, if the employee is absent.

List of Employees

In this the employee list will be in alphabetical order. It displays – name – qualification –

father's name – basic salary – address – date of birth – age – designation – sex – date of joining.

Day wise attendance of Employees

It is used to mark the daywise attendance of the employee – select attendance register – mark – legend button is used here – used to mark shortly like P for present and A for absent – It all are present select mark all present button – save it.

Employee Registration Module

ESI Report: ESI is employee state insurance. It is a contribution of both employee and employer – ESI reports are calculated for selected periods – In the report a list of employees with information such as total number of days, days worked, salary, ESI of employee, employee contributions, daily wages.

Employee Provident Fund Reports (EPF) : EPF report is employee provident fund report – In EPF report we can see a list of employees with information such as Designation, EPF of employee, employer contribution, daily wages.

ESI & EPF Payment: ESI & EPF payment can be done for a financial year on monthly basis – It contains following informations such as month, employees ESI, EPF, voucher number etc.

PATIENT CARE MODULE

- 1. Patient master index:** It is an electronic medical database that hold information on every patient registered at a health care centre.
- 2. Patient Encounter System:** It is a computerized system designed to help address these challenges relating to rising healthcare costs – This easy to use comprehensive program helps streamline administrative tasks, more coding accuracy, improve practice profitability and gives more time to focus on providing quality patient care.

- 3. Medical Record Management:** It is a systematic documentation of a patient's medical history and care. Medical Records management system site is an effort from a small group of IT specialists to build an online health records for the doctors. In objective of the service is the main goal of the website so the doctors can add, edit or delete their records with few clicks in few records. This online service helps the doctors to reach their records from anywhere at anytime with total confidentiality of the records and data.
- 4. Doctor Tracking System:** It consists of sensors and keypads around a medical facility that are used to keep track of the location of doctors, nurses and other staff members - These systems have IT features that allow facilities to make better and faster decisions such as when a patient should be revisited a when to clean up room and have tracking integrated with enterprise systems so that doctors room visits can in correlated with patient billing other potential numbers of this technology to track medicine dispensing and to better improve the workflow around a medical facility.
- 5. Patient Queue Management:** It enable managers to efficiently organize staff and resources so that patients receive the right care at the right time – The solution manages the flow of patients and their associated information from check into check out covering stages such as calling a patient in the waiting room, tracking a patient's status and provision of information about the entire visit including treatment and waiting times.
- 6. Data Management and Reporting:** Responsible for performance monitoring and timing – Delivering administrative information effectively and efficiently.
- 7. Doctor Tracking System:** Consists of sensors and keypads around a medical facility that are used to keep track of the location of doctors, nurses and other staff members. As doctors and nurses move about they would press a button to inform the system about their location so that they could be located at a moment notice – Display panels in the rooms would inform a doctor as to the queue of room for him or her to visit so that or the would not have to take the extra time to return to the clerical station. Also the display panels would keep alerting doctors to emergency, highly urgent or expiring timer vibration. These systems have IT features that allow facilities to make better and faster decisions when a patient should be revisited or when to clean up a room and have a tracking created which is integrated with their enterprise systems so that doctors' room visits can be correlated with patient billing.
- 8. ICU Management:** It is a domain specific modular based unit management unit which delivers operational efficiencies as well as meeting ICU's strategic needs to drive research based improvement - The system is a proprietary software and hardware solution. In relation to software the system provides a platform for ICU's to manage clinical, administrative and non staff activities in relation to hardware, the solution collects,

standardize and concentrate data from multiple medical devices (pumps, monitors, ventilators etc.) and feeds those information to the software for display and analysis.

9. Operation Theatre Management: It focuses on maximizing operational efficiency at the facility i.e. to maximize the number of surgical cases that can be done on a given day while minimizing the required resources and related costs – It also deals with long term decision making to ensure i) patient safety, ii) provide surgeons with appropriate access to the OR so that patients can have operations in a timely manner – iii) Decrease patient delays – iv) Enhance satisfaction among patients, staff and physicians.

10. Bed Management: It is the allocation and provision of beds, especially in a hospital where beds in specialist wards are a scarce resource. Because hospital beds are economically scarce, resources, there is naturally pressure to more high occupancy rates and therefore a minimal buffer of empty beds. Bed management systems are developed by software development companies specializing in the health sector to technical health care standard such as HL7, ICD-10 and DMD. A bed request and management system redesigned to help hospital staff deliver high levels of care to patients by providing real time information to bed managers.

Patient Care Module: The patient care module is a self contained, in-room bathroom that can be easily located in close proximity to the bed. Available in a nearly unlimited color selection, the module offers a contemporary, aesthetically pleasing design to complement the décor of any patient care environment

Compact and Self-Contained: The module, which includes a concealed flushing chief, paper holder and utensil washing arm, is less costly than a traditional bathroom.

Easy installation: The module installs easily using standard plumbing components, and can be relocated to meet changing needs. The availability of standard components helps reduce maintenance tasks related to leaks or operational problems.

Retractable Water Closet Cover: The cover conceals the standard water closet when not in use.

Built in utensil washing arm: This built in feature allows for convenient and easy cleaning of bed pans.

High density wood core cabinet: The cabinet is constructed of marine – grade plywood with a high pressure laminate finish it is fitted with a deep, stainless steel sink that has a single – lever handle and swing spout.

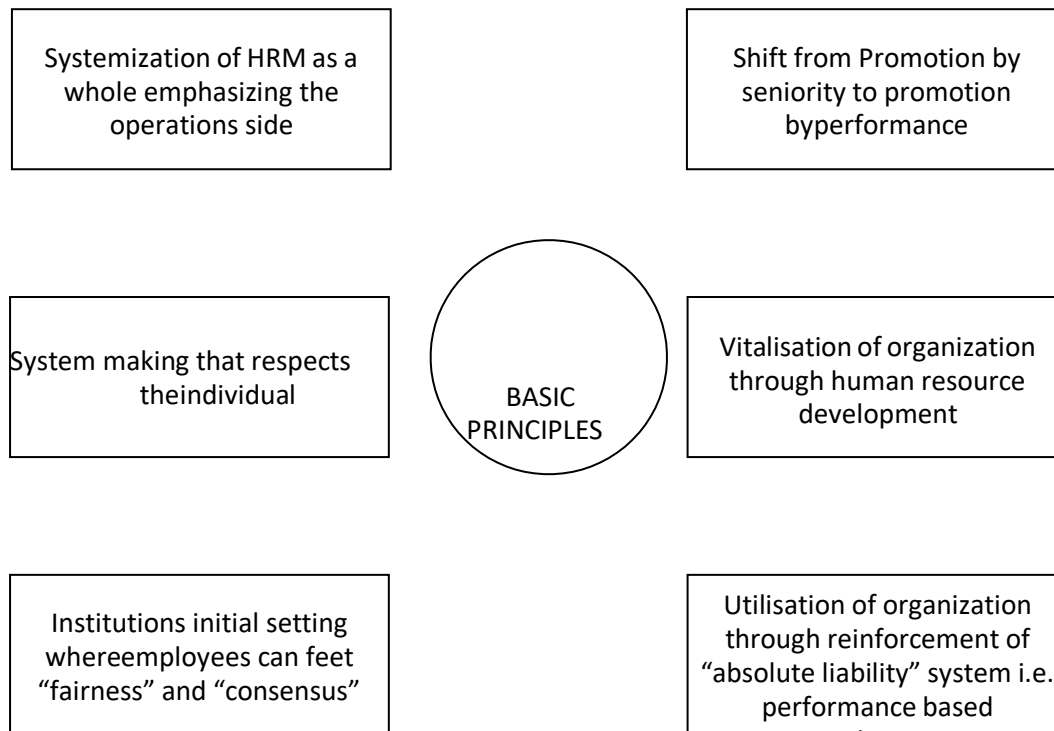
Optional Features

- Foot pedal water controls
- Infra-red water controls
- Floor or wall – mounted water closet
- Squared corners
- Utility connections.

HUMAN RESOURCE MANAGEMENT SYSTEM

It is a strategies and heuristic approach to managing an organization most valued assets there people – It is the intersection between human resources and information technology – The success of any organization depends on the ability to manage a diverse range of talent that can bring innovative ideas, perspective and opinions to their work – HR function consists of tracking existing employee data which traditionally includes personal histories, skills, capabilities, accomplishments and salaries - to reduce the manual work load of administrative activities, specialized, human resource management system was introduced – HR is the management of an organization employees and their details.

Objective: To maximize the return on investment from organizations human capital and minimize financial risk.



Currently human resource management systems encompass

- i) Pay rolls
- ii) Work time
- iii) Appraisal performance
- iv) Benefits administration
- v) HR Management information system
- vi) Recruiting
- vii) Training
- viii) Employee self service

Pay roll: Pay roll automates the pay process by gathering data on employee time and attendance, calculating various deductions and taxes and generating periodic pay cheques and employee tax report.

Work Time: Work produce gathers standardized time and work related efforts – The most advanced modules provides broad flexibility in data collection methods and data analysis features cost analysis and efficiency matrices are the primary functions.

Benefits administration: Aims module provides a system for organizations to administer a track employee participation in benefits program – These typically encompasses insurances compensation, profit sharing and retirement.

HR Management Information System: This module is a component covering many other HR aspects from application to retirement – This system records basic demographic and address data, solution, training and development, capabilities and skill management.

Recruiting : Online recruiting has become one of the primary methods employed.

Training: It provides a system for organizations to administer and track employee training and development efforts – This systems normally called a learning, management systems, if astand above product, allows HR to track education, qualification and skills of the employees as well as outlining what training courses, books, CD's web based learning or materials are available to develop which skills.

Employee self service: It alloys the employer to query HR related data and performs source HR transactions over the system – employees may query their attendance record from the system without asking the information from the personnel – The module also lets supervisors approve operations theatre from their subordinates through requests the system without overloading the task on HR department.

PHARMACY MODULE

Pharmacy module deals with automation of workflow and administration management process of Pharmacy. The pharmacy module is equipped with bar coding facility, which makes the delivery of medical items to the patients more efficient. This module deals with theactivities such as

- Enquiry
- Purchase order
- Online approval
- Supplier information

- Online request for stock from various substore
- Online stock transfer
- Stock adjustment
- Stock in hand reports
- Destruction of expired items

HOSPITAL PHARMACY

- Pharmacy in the hospitals was started primarily for purchase and formulation o drugs, medicinal preparations, chemicals and reagents.
- Pharmacy the utilized for compounding of medicines when ever necessary.
- The department the used responsible for safe storage and serve
- The secondary function of the pharmacy is to provide the guidance to the medical and nursing staff.
- It also involved in the pharmaceutical and pharmacological research.
- Pharmacy department should have dark and continuous relation with medical and nursing services.
- Pharmacy department should follow established material management methods for purchase storage and issue of medicines.

Staff required: Staff required of pharmacy depends on service provided by the department – There will be one pharmacist for 50-100 beds.

Physical Facilities

- Pharmacy server both inpatient and out patient.
- It is ideal to locate near the exist.
- It should be accessible to the staff, relatives of the patients admitted to the wards and also to supplier.

Size: the depends on various factors like size, shape and type of hospital

- The hospital whether encourages rational use of drugs.
- The use of drug is rationalised the size required will be less.

Space: The following are recommended space requirement for a medium sized hospital – Three depending counters and one separate each counter.

Equipment : Refrigerator for storing vaccines other substances – The refrigerator should be provided with thermometer in order to record the temperature inside.

Working yours: The hospital pharmacy may be kept open 24 hours – two shifted are kept – it is eventual to ensure the availability of largest number of pharmaceutical between 9.00 a.m. and 3 – separate night pharmacy the required during emergency.

Reports : The following reports can be generated as a part of this module – stock reporter on drug and consumable – Report on printing of expired drug list – Report on requisitionprinting – report on issue slip printing.

REFERENCE BOOKS

1. Dr. L.L. Rao, Hospital Management. Annamalai University Press
2. R. D. Lele, Computers in Medicine, Tata McGraw Hill, 2008

UNIT –V**PART – A**

1	What is admission?
2	What is maintenance of instruments?
3	What do you mean by medical records index module?
4	Define hospital information system.
5	What are the factors influencing financial plan.
6	What are the factors affecting the hospital expenditure?
7	Define budget.
8	Define public health.
9	Write briefly on constraint and impetus to quality control.
10	What is Human resource management system?

PART – B

1	Discuss the role of public relation in hospital.
2	Discuss in detail about Financial Health services.
3	Explain the measures for maintenance of equipments and instruments in hospital.
4	Discuss the significance of sound financial plan for a Health care organization.
5	What is quality assurance? Discuss the role of quality management in hospital.
6	Define public health. Mention different types of public in relation to the hospital set up. Mention the role of public relation officer in the hospital.
7	Define Budget. Mention different types. Discuss the merits and demerits of each system.
8	What are the different sources of funds available for the hospitals? Discuss the importance of Budget in hospital management.