DIAGNOSTIC, SUPPORT AND UTILITY SERVICES

P.G. Diploma in Hospital and Health Care Management, PAPER - IV

PART - I

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FOREWORD

Acharya Nagarjuna University, since its establishment in 1976, has been moving ahead in the path of academic excellence, offering a variety of courses and research contributions. The University achieved recognition as one of the eminent universities in the country by gaining A grade from the NAAC 2016. At present Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels to students of 447 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University had started the Centre for Distance Education in 2003-04 with the aim to bring Higher education within the reach of all. The Centre has been extending services to those who cannot join in colleges, cannot afford the exorbitant fees as regular students, and to housewives desirous of pursuing higher studies to study B.A., B.Com, and B.Sc., Courses at the Degree level and M.A., M.Com., M.Sc, M.B.A. and LL.M. courses at the PG level.

For better understanding by students, self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been prepared with care and expertise. However constructive ideas and scholarly suggestions are welcome from students and teachers. Such ideas will be incorporated for the greater efficacy of the distance mode of education. For clarification of doubts and feedback, Weekly classes and contact classes are arranged at UG and PG levels respectively.

I wish the students who pursue higher education through Centre for Distance Education will not only be personally benefited by improving their qualifications but also strive for nation's growth by being a member in Knowledge society I hope that in the years to come, the Centre for Distance Education will grow in strength by introducing new courses, catering to the needs of people. I congratulate all the Directors, Academic coordinators, Editors, Lesson - Writers, and Academic Counsellors and Non-teaching staff of the Centre who have been extending their services in these endeavours.

Prof. Raja Sekhar P.
Vice - Chancellor (FAC)
Acharya Nagarjuna University

PAPER - IV: DIAGNOSTIC, SUPPORT AND UTILITY SERVICES

Syllabus

UNIT - I

Clinical Services - Outpatient Services - Accident and Emergency Services - Inpatient Services - Operation Theatre Services - Intensive Care Unit Services - Nursing Services.

UNIT - II

Diagnostic and Therapeutic Services - Laboratory Services - Radio Diagnosis and Imaging Services - Radiation Hazards - Blood Transfusion Services - Pharmacy Services.

UNIT - III

Support and Utility Services - Sterile Supply Services in Hospitals - Medical Records Department - Linen and Laundry Services - Dietary Services - Housekeeping Services - Mortuary Services - Transportation System - Ambulance Services - Sanitation and Waste Management.

UNIT - IV

Safety Services - Hospital Acquired Infection - Disaster Management - Fire Fighting - Security Services.

REFERENCE BOOKS:

01) Outpatient Services in Hospital Planning and Administration, WHO, Zeniva.
02) Kaunders, GD, Gopinadh, S and Katakam,A, Outpatient Services in Hospitals, Tata McGraw Hill Publishing Pvt.Ltd., New Delhi.
03) Role of Hospitals in Ambulatory Care, WHO Technical Series, Zeniva.
04) Hospital Planning and Administration, WHO, Zeniva.
05) McGibony, "Principles of Hospital Administration", Chicago.
06) The Organization and Management of Hospital Dietary Services, NIHFW, New Delhi

Question Paper Pattern

Each paper carries 100 marks. 25 marks Internal assessment through assignments and 75 marks for year end examination. The duration of Examination for theory papers will be three hours.

Pattern :

The question paper is divided into 3 sections. Section A, Section B and Section - C

Section - A (3 x 5 = 15 marks)

Section A consists of 6 questions out of which the candidate has to write 3 questions. Each question carries 5 marks. Totally 15 marks.

Section - B (3 x 15 = 45 marks)

Section B consists of 6 questions out of which the candidate has to write 3 questions. Each question carries 15 marks. Totally 45 marks.

Section - C (15 marks)

Section C Consists of one compulsory question (either case study or problem) which carries 15 marks.

CONTENT

Unit – I

UNIT-III

UNIT-IV

Lesson - I

OUTPATIENT SERVICES

OBJECTIVES:

The objective of this lesson is to explain the role and functions of outpatient services in providing health care. Further, it also provides the physical facilities, layout, equipment, and describe the policies and procedures in the organisation and management of Outpatient Services. It also provides a plan for monitoring and evaluation of Outpatient Services.

STRUCTURE:

1.1. Introduction:

In any hospital, providing outpatient services is a key service which influences the image and success of it. The outpatient services have emerged according to the needs and expectations of the patients, may range from few minor clinical services to highly specialised and organised services, the total patient care is to be understood as an effective combination of both inpatient and outpatient services. In this lesson and attempt in made to present the origin of outpatient services along with role, functions and types of it. In addition to these, the various aspects related to planning and management of outpatient services is also highlighted. The evaluation of outpatient services is also presented in this lesson.

1.2. Evolution of Outpatient Services:

The evolution of outpatient services can be traced back to 1750 when few physicians were asked to provide medical advise twice in a week. The advises are meant for poorer sections of the society. The idea of providing advises to poor patients has led to the entry of modern outpatient departments. By 1850, dispensaries were opened up in USA as an institution to provide outpatient services to the patients. The patients are normally referred for treatment by outsiders in three different ways:

i) The doctors examine the patient at the residence of the patient.

ii) The patient is checked up in a specialist room.

iii) The patients are referred to the outpatient departments in any dispensary.

The medical services were made available to the richer sections of the society or patients suffering from very high sick. The outpatient departments were organised for the poorer sections of the society on a charitable basis with the recent developments in the medical science, the services of experts like radiologists and pathologists have become necessary for use to patients whether rich or poor. These services are to be made available to patients were opened up in many hospitals run by Government and Private doctors. The general practitioners are worried as their incomes have come down carnderably.

The outpatient departments have gained strength in the recent past and many of the investigational, diagnostic and other health services are administered in outpatient department effectively. There has been a steady progress in the role, functions and types of health services provided by outpatient department.

1.3. Role, Functions and types

Outpatient department is the catalyst between hospital administration and patients. It displays the image of a hospital. The role of the department can be discussed as under:

1. Viewed from patients, the department is very useful in providing services at an economicalcost.
2. Cases of minor injury, disease of minor nature are treated in the department immediately and patients can be relieved from such problems.
3. It relieves the burden of specialists and super specialists from attending to minor causes or diseases.
4. The burden of the Government relating to cost of care to the patient can be reduced considerably.

Functions:

The functions of outpatient department can be listed as under:

1. To provide an opportunity to the society for identification of major source of specialist diagnostic medical services.
2. To carry out services related to prevention and promotion of services like family welfare, poliovaccination, immunization, screening etc.
3. To provide a record of patients who are utilising hospital services for various individuals and institutions for research purposes.
4. To provide training to medical students, house surgeons and other professional staff such as nurses and technicians related to various experiences.
5. To provide health education through circulation of pamphlets, and other documents.
6. To refer patients for admission into hospital and to provide care after discharge from hospital.

Types:

The outpatient services can be of two types:

1. Centralised
2. Decentralised

In the former, all the outpatient services relating to all the specialities are provided under one roof. Polyclinics in various hospitals are working on the same concept. In the latter, the outpatient services relating to all the specialities are provided in different departments. In the smaller hospitals only few services are made available, while in the larger hospitals, many of the services are provided under one roof.

Now-a-days, the patients are looking for various services under one hospital and the time for reduction of going to a number of places for utilising the hospital services.

1.4 Aspects related to planning of outpatient services:

Since outpatient department is to be organised as a seperate and distinct department, the various aspects related to outpatient services are to be planned and arranged in a systematic way so as to reduce inconvenience for the patients. The various aspects related to planning of outpatient department include physical facilities (location of various facilities and equipments) and staff. The planning aspects related to physical facilities can be presented as under.

1. Physical facilities:

The outpatient department should be located in such a way that it should be easily accessible to registration, admission, medical records and documents, emergency and other social services. The department should be located near to the main entrance of the hospital. The location of the department must be in such a way that it should prevent noise and dust pollution. It should be distantly located from inpatient wards but a connecting link is necessary for those wards and other departments. Since in a hospital, there are many departments the outpatient department of all specialities should be placed in the same premises so as to facilitate counsultations among specialists. The following precautions are to be taken for planning of outpatient department:

1. The patients are to be provided with seating and they move in a systematic way without causing inconvenience to other patients.
2. The department should provide adequate space for blood tests, X-ray an other clinical examinations.
3. Depending on the flow of patient, necessary arrangements should be made for expansion of the department.

Proper precautions should also be taken for the layout of the outpatient department. A number of designs may be used such as double loaded single corridors, double corridor for entry from the opposite sides of the room and the triple corridor which provides two rooms of examination treatment rooms on each side of a corridor. In case of space provisions also, certain standards have been prescribed. For example: 6 square metres per bed in case of diagnostic zone, 10 square metres per bed for the ambulatory zone, and 2 square metres per bed for entrance zone etc. In the

total hospital area 60 square metres should be allocated for the above provisions and services.

The physical facilities which are to be considered for the outpatient department may be stated as follows:

1. Entrance Zone for Public Areas
2. Diagnostic Zone for Clinical Areas
3. Administrative Zone for Management Areas
4. Services Zone for Circulation Areas

The above facilities may be explained as under.

1. Entra[illegible]e Zone for Public Areas:

The entrance zone for public areas shall provide for entrance, reception and information registration and records, waiting, public toilets and a canteen for people who visit hospital for different services. The entrance should be easily accessible with large doors, few and convenient steps. Another counter shall be maintained for providing. Information. Registration counter should be situated near the entrance with proper records for admission and discharge. A huge waiting hall with adequate seating arrangements should be provided. For visitors, toilets is another facility which is to be considered in the entrance zone. A canteen maintained with hygienic manner is another essential facility in the entrance zone. The guidelines are provided for all these facilities and services. For example: waiting area is to be provided at the scale of 0.1 square metre per patient with a minimum of 4 square metres.

2. Diagnostic Zone for Clinical Areas:

The diagnostic zone for clinical areas include surgical, Dental, Opthalmine, ENT, Obsteric, Gynaecological, Paediatric, Medical, Psychiatric, Dermatology, Venereology, Orthopaedic and Emergency Departments. This is a very important zone in case of any hospital as the inflow of patients depends on the treatement provided through these divisions. Recognising the need for super specialisation, many of the hospitals have been making necessary arrangements for superspeciality divisions in the areas of cardiology, Neurology, Urology and Surgical etc. In this zone additional facilities for treatment like minor operations, injections, dressing and dispensary and services relating to pathology and bloodbank. It is through these divisions, many of the health education programmes to educate the public in the areas of environmental hygiene and family welfare etc. The general requiren[illegible]nts of the diagnostic zone include sub-waiting area, consultation room with properly equipped facilities like doctors table, patient's table, examination table and wash basin etc., In case of few departments, special examination rooms are also necessary depending on the type of equipment being used. Many of the ancillary facilities are also required for this zone which include injection room, treatment and dressing room and pharmacy. In the injection room, adequate space should be provided for waiting area for 10-20 patients. Similarly, reasonable space should be provided in case of treatment, dressing room, and pharmacy, etc., In the pharmacy facilities for drug storage shelfes and compounding counters shall be provided. In this zone, special facilities should be provided for the following:

i) Laboratory for blood, urine and stool samples collection. Necessary facilities to be provided for seperate toilets for male and female patients.

ii) A seperate radiology department for providing X-ray facilities for both inpatients as well as outpatients is to be arranged.

iii) In any clinical area, blood bank is another required facility. Which consists of reception and waiting area, laboratory for grouping of blood, a room for storage of blood, and facilities for washing, sterilization, office and toilet facilities.

iv) A very important facility relating to this zone is a counselling division to provide health education with a small conference room, TV, Video player, and other health education material. The social workers or counsellors provide guidance to patients on health related aspects.

v) In every teaching hospital, screening clinic with few cubicles and provided with examination tables, chairs, etc., this facility is expected to reduce the workload on the speciality clinics and increases quality of speciality services.

vi) Communal health service facility is another section in this zone. A room with 15 sq. metre should be provided for this facility. The services include advice on sanitation, communicable diseases, nutrition, occupational hazards, well baby and adult clinics etc.,

3. Administrative Zone for Management Areas:

Any hospital whether big or small, public or private, needs a well equipped administrative zone for managing the hospital. A manager or administrator with necessary qualifications and experience shall be appointed for managing the affairs of the hospital. The office of the administrator should consist of 15 sq. metre for a hospital with 100 or more beds is essential. The office should provide for maintaining records of staff, patients, requisitions and other relevant documents necessary for managing the affairs of the hospital. A small room witth 4 sq. metres is to be provided for keeping house cleaning materials. Another important facility in this zone is strage facility. Two seperate sections are required for general stores and drug stores. A small area with 2 sq. metres is necessary for storage of daily supplies of linew.

4. Services Zone for Circulation Areas:

This zone includes corridors, stairs, lifts etc., Elevators and lifts should be easily accessible to cardiac and disabled patients. The required space for corridors shall be 1.8 metre wide. These facilities normally account for 1/3 of the total binding area. Telecommunication facilities, security posts should be arranged at strategic locations for the safety and protection of the hospital.

In all the above mentioned zones, physical layout with adequate dimensions is very important. In these zones, human resources and equipments play an important role in providing these facilities. The requirements of staff depends on the objectives of each department. A common staff may be appointed for both inpatient and outpatient departments. Adequate number of Nursing staff (registered Nurses, ANM's) should be appointed in the outpatient department. Additional staff are to be appointed in laboratory, radiology, and blood bank divisions. Technical staff with ECG and EEG experince are also required. Clinical staff with accounting and computer knowledge are to be

appointed for registration, billing, cash transactions, secretarial and medical record etc., In case of hospitals which provide teaching house surgeons and residents assist professors in providing care of patients. Receptionists are another group of important staff members in the outpatient department. In case of large hospitals, volunteers provide voluntary medical services. In the outpatient departments, proper equipments like physicians table, patients sitting table, examination table, X-ray view box, and wash basins, etc., should be provided.

5. Factors related to management of outpatient services:

The outpatient services are to be properly managed. The image of the hospital depends to a large extent on the management of outpatient services. The management of hospital is influenced by a number of factors which include the following:

a) Policy and Procedures:

The policy relating to outpatient services is expected to achieve continuity of high quality patient care with recent techniques and methods in order to obtain total satisfaction of patients at all times with the active co-operation of staff in the hospital working in the both inpatient and outpatient departments. The procedures in the inpatient and outpatient departments should be clearly laid down in different languages. All the procedures in these departments should be appropriately recorded and documented so that it helps patients to assess the out come of the treatment. Now-a-days many of the hospitals are implementing appointment system so that the waiting time of the patients shall be reduced. In case of some of the hospitals, group appointment system is followed. The enables the physicians to diagnose the cases of few individual patients at a time in the limited space availble in the waiting rooms. Different boards should be provided with the following details:

i) Name and specialisation of Doctors working in the hospital
ii) List of services provided by the hospital
iii) Direction symbols for different departments
iv) Different quotations and pictures to reduce the psychological depression of patients.
v) Colour coding of different services

The information relating to all the aspects should be displayed in regional language to facilitate the illiterates to understand the policy and procedures of the hospitals.

b. Fixation of timings:

The timings in the outpatient department should be fixed in such a way that the waiting time for patients should be reduced to the minimum extent possible. Normal OP timings should be fixed in such a way that it is convenient as per the local and hospital needs. Generally, an OP should be kept open from 8 AM - 1 PM and 4 PM - 8 PM on all six days. Due to various reasons, patients have to wait for longer time for consultations, diagnostics, treatment and to buy medicines at pharmacy. The reasons for this waiting time should be investigated by hospital management and necessary steps must be taken to reduce the waiting time of patients for different purposes. In case of facilities like laboratory, radiology and blood bank, these should be kept open atleast open for one hour

before and one hour after the OP hours. Seperate screening clinics which are working as a part of the OP department should help in the disposal of patients with minor illness thus leading to less crowiding and waiting time in speciality clinics. Special clinics like well-baby, diabetes, leprosy, TB, Cancer, HIV, AIDS may be opened to reduce crowding in the department. All the patients who are registered in the reception should be provided diagnosis. More number of staff should be made available in the radiology, laboratory etc., at peak hours which will go a long way in improving the patients satisfaction. The patients records of indcor and outdoor services, investigation, and treatment should be available in easy form at the time of each visit by the patient.

c) Structure of administration:

The administrative structure of the hospitals play an important role in improving the patient satisfaction and enhancing the image of the hospitals. There may be considerable differences in the administrative structure of large and small hospitals. In case of large hospital, a Director (Medical) or superintendent (Medical) may be kept in charge of the outpatient department. He employs assistants in the defferent divisions, sections of the hospital. These assistants report to him. The administrators should attend to the problems of patients in obtaining medical services from the hospital and should take necessary measures to solve them. The patients grievances include delay in attending to their diseases, high charges and wrong diagnosis etc. The Nursing section of the OP department should be under the control of a well qualified and experienced nurse whose major function is to monitor the work in various clinics. She is expected to direct the activities of the nurses and other staff working in the department.

1.6. Evaluation of Outpatient Services:

The quality of outpatient services provided by outpatient department needs to be evaluated on a continuous basis so as to improve the areas of deficiency and to improve the image of the hospital. Continuous efforts are required to improve the quality of services as the patients are ready to spend more money in order to receive qualitative health services. To improve services, data need to be collected, analysed and reported on a regular basis by a responsible officer in the hospital. The data required for evaluation of outpatient services include the following:

a) Data relating to visits by patients:

The data relating to department wise statistics of repeat and new visits on regular basis, availability of doctors and staff. Changes in new and repeat visits, frequency of visits in different days of the week or month, etc. In addition to these, clinic efficiency rate is to be calculated by considering the number of hours the clinic was opened, number of rooms available, and number of patients seen or average service time.

b) Data relating to utilization:

The data relating to utilization which consists of number of people who account for annual visit to the hospital for various services. The people who visit the hospital should be divided according to age, sex, education, and income. This data helps in planning staffing and other issues related to improve services of the hospital.

c) Special health programmes:

Many of the hospitals organise regular health check up programmes, immunization, baby check up and conduct new appointments etc., The data relating to these programmes is to be analysed for the purpose of distribution of revenues which are required to be changed to provide better services to patients.

d) Match costs with revenue:

The cost of each service should be matched with revenues from the respective service. As far as practicable, the revenue from each service must made equal to the cost of each service. Both direct and indirect patient costs are to be calculated and matched with revenues.

The evaluation of services of outpatient department should be a continuous process and the necessary data is to be collected from patients and visitors through a structured questionnaire and the problems and suggestions which are highlighted must be considered with immediate effect.

1.7. Conclusion

The outpatient services of outpatient department play important role in improving the image of the hospital. The outpatient departments provide a variety of services from minor clinical services to highly evolved and organised services. The outpatient services have to be integrated with inpatient services for the continuity of the health care. There are broadly two types of services relating to outpatient departments. Centralised and decentralised services are to be provided. The outpatient department is to be properly planned and organised with appropriate physical facilities, staffing and equipments. However, there are a number of managerial issues which are involved in organisation of outpatient department. The outpatient department should be continuously monitored to improve the health services in the hospitals.

1.8 Self - assessment Questions:

1. Explain the importance, functions and types of outpatient department.
2. Enumerate the various aspects related to planning of outpatient department.
3. Write an essay on the management and evaluation of outpatient services.

1.9. Key Words

1. OPD - Popularly called outpatient department in any hospital
2. Diagnostic Zone - a crucial and important zone in any hospital which provides a variety of health services.
3. Circulation Zone - an area which provides for lifts, elevators to carry patients into the hospital.
4. Ambulatory care - Outpatient care or services.
5. Group appointment - Calling for a group of patients to be present at a given time.

1.10. Further Readings

1. Kunders G.D., Gopinath Sand Ketakonn A. "Outpatient Services in Hospitals - Planning, Design and Management" Tata McGraw Hill Pub. Co., Ltd., New Delhi, 1999.
2. Davis R.L. and Macanlay H.M.C. "Outpatient Services in Hospital Planning and Administration" WHO, Geneva, 1966

Dr. M.S. Narayana

Lesson - 2

ACCIDENT & EMERGENCY SERVICES

Objectives:

The objectives of this lesson are to explain the role and importance of the Accident and Emergency Services, to describe the planning and other managerial aspects of Emergency Services. It also makes an effort to identify the equipments required for this department and to enumerate the appropriate measures for evaluating the services provided.

Structure:

2.1 Introduction:

A very important service which constitutes one of the most vital, important and sensitive component of acute medical care services provided by the hospital is accident and emergency services. In many of the hospitals, a separate department called "Casuality" is established. Since this is most important service, and is provided non-stop, round the clock, throughout the year, it helps a lot in contributing to the community health. This service should be maintained smoothly and in a stream lined way. Effective and efficient functioning of this department helps to improve image of the hospital. The casuality department is itself called as a 'mini hospital' within the operation of the hospital.

2.2. Scope and Functions:

Emergency in case of Medical Services is defined as a situation when the patient requires urgent and high quality medical care to prevent loss of life and limb and initiate action for the restoration of normal healthy life. Emergency can also be understood as a condition determined clinically or considered by the patient or his/her relatives or attendants requiring urgent medical services without which, it may result in loss of life or limb. An accident may be defined as "an

unexpected, unplanned occurrence, which may involve injury or an unpremeditated event resulting in recognisable damage". In the earlier days of the present century, every hospital had a seperate room meant for treating accidents. Later, these were changed as regular medical clinics in which patients used to walk in for normal medical problems. A committee which was constituted known as "Platt Committee in UK" recommended for the establishment of a separate department with the name "Accident and Emergency Department". The department gradually developed into a full-fledged department in many of the developed countries. In India, the central council of Health in 1963 urged all state Governments to set up emergency medical services in all cities and towns. Though a number of steps were taken to develop the position of the department, still the department could not make much progress as there are many necessary inputs which have to be provided to strengthen it. However, the scope of these services has been increasing and this has assumed as the role of a 'mini hospital' within the scope of the hospital.

The functions of the accident and emergency service department includes the following:

- to provide immediate and life saving medical care uninterruptedly. Services offered through this department should be fast, quick and efficient as the brought in patients are likely to deteriorate quickly.
- to be a liasion with the courts and police in medico legal cases.
- to be humanitarian to the emotional needs of patients and attendants.
- to offer education, training and research activities of medical staff.
- to provide ambulance services for pre and post hospital care and transportation of patients to and from the hospital.
- to act as the communicator and fulfil the role of information in case of disasters or any incidents resulting in loss of life.

The provision of facilities in case of these services differ according to the size of the hospital. In case of large hospitals, there will be a seperate department for the provision of accident and emergency services. In case of smaller hospitals, these services are shared with facilities in outpatient department during non-outpatient department hours. The operation of these services depends on the number of beds and the policy of the hospital.

2.3 Types of Services:

These are four major types of emergency services.

- Major Emergency Service which is provided in large, teaching and tertiary hospitals. All the specialised facilities are arranged in this service. Different categories of service like diagnostic, therc apevatic and other special services are made avail able.
- Basic Emergency Service which is available in hospitals with all basic emergency facilities. A separate centre is run by general duty medical officer round the clock. Specialists of all categories are available on call duty.
- Stand by Emergency Services which are available in Primary Health Centres and Community Health Centres. These are run by trained, skilled nurses and Medical officers are available on call duty.

- Referral Emergency Services are those in which only first aid is given and the pa tients are referred to other health centres or hospitals according to the severity of the accident and the intensity of care. These are provided by AIIMS and other ter tiary level hospitals.

2.4 Planning of Emergency Department:

The location and layout of the emergency department should be properly planned in such a way that it is convenient for the doctors to attend to the patients for immediate treatment. The location of the department should be situated near the hospital with direct access from the main road with large space for ambulance vehicles and parking. Since many of the cases belong to accidents, enough space should be provided for patients to get down from vehicles or ambulances quickly. Proper sign boards should be arranged for any identification of the department. It should be readily accessible from wards, operation theatre, ICU, laboratories, blood bank and mortuary.

The space required for the accident and emergency department depends on the number of patients expected on an average per day, the size and type of the hospital and the type of medical facilities available. The general requirement of this department may be 1000-1500 sq. metres on the assumption that the expected patients would be approximately 100-150 per day. Though there has been a change in the size of roads and other infrastructural facilities, the accidents have been increasing because of a variety of reasons. In the large hospitals, there is a need to establish a seperate independent department because the dependant population are more and concentrated. While planning for the department, scope for future expansion must be considered and adequate number of rooms with good accessibility to patients is to be considered. At the entrance of the department, enough space should be arranged for free movement of ambulances and other vehicles.

The approach way into the department should be arranged with ramps, steps with side rails and a two-way swinging type door for easy flow of patients. Immediately after entering the department, adequate space should be provided in a waiting hall with all basic necessities like telephone, drinking water, seating arrangement with news papers and magazines for the attendants. In the waiting hall, enough space should be provided for reception, enquiry and facilities for trollies and wheel chairs. In addition to the main area, treatment area occupy an important place in this department. The treatment area should be kept seperate from other departments through partitions and curtains. The area should be provided with necessary tables and benches for the examination and treatment of the patients. A seperate room should be clearly provided for observation of patients who are likely to stay in the hospital for few hours. In the treatment area, rooms are to be provided for essential drugs, medicines, treatment for fracture, staff rest room, operation theatre complex, a room for infections patients, duty room for doctors and nurses and room for other staff. The department also requires radio diagnosis unit with dark room and laboratory etc., to bring people who are dead in different accidents, a seperate room can be provided.

The department should be kept away from noise and other types of disturbances. There should be minimum hurdles for patient traffic and privacy is required to be maintained. The trolleys and wheel chairs should go uninterrupted and free with non-slippery floor. The wall colours should

be of light shades so as to give psychological strength to patients. Another important aspect of the maintenance of emergency department is installation of an effective communication system. Internal and external communication devices should be provided and necessary emergency communication links with other sections such as ICU, blood bank, pharmacy stores and other support service areas. In view of the changing technology, pagers and mobiles should be provided to the staff working in the department. A good number of extension telephones should be provided in the department.

2.5 Staffing Requirements:

Even though, the department is provided with various facilities and necessary equipments, it is equally important that the staff who are working in the department should be highly skilled and competent. The staff should be balanced, even temperament, calm and oriented to the functioning of the department. The requirements of staffing depends on a number of factors like size and nature of hospital, work load of the department, resources available. It is very much essential that a proper co-ordination and team work is essential for the effective services provided by the department. The staff must be continuously trained so as to keep them upto date with the changes in technology, equipment and other facilities.

The staffing requirements of different categories of staff may be as under:

1. Medical Staff: These include physicians, surgeons, Paediatrician, orthopaedic surgeons and anaesthetists etc. In addition to the above staff, house officers, PG students etc., should also be posted. All the staff members must be available full time on call.

2. Nursing Staff: The Nurses should be well trained, competent, intelligent, qualified and dynamic and should be able to initiate life saving measures and techniques based on the situation of the patient.

3. Para Medical Staff: These include assistants in operation theatre, ECG technicians, laboratory technicians, radiographers etc.

4. Group 'D' Staff: These include drivers, sweepers and ward boys etc., whose services are required continuously for the department.

2.6 Requirements of equipment:

The emergency services in the department, can be properly rendered only when the properly working equipments are provided. The following equipments are compulsorily to be arranged in the department:

a) centralised piped oxygen and suction supply.
b) wall mounted or postable mano meter.
c) airways, outlets and resuscitation bags.
d) respiratory equipment.
e) portable defibrillators and ECG.
f) special medications, intravenous equipments etc.

g) cardiac monitors and defibrillators.
h) sufficient bandages, drugs and plasters.
i) adequate number of trollies and wheel chairs.
j) necessary equipments required for OT and ICU.
k) utility table with emesis basin, tray etc.
l) slit lamp and ENT examination equipment.
m) other equipments which include radiology equipments, X-ray machines, CT facility, Ultra sound machines and investigation equipments.

It is also to be observed that the equipment should be properly maintained in order to ensure reliability and readiness, extend the useful life of equipment, and ensure safety of operation and minimum wastage of resources. All preventive and breakdown maintenance must be done at regular intervals. The equipments for the proper functioning should be maintained at three levels:

1. First Level or day to day maintance by the operator
2. Second Level by in house staff
3. Third Level by manufacturers, bio-medical engineers or third party.

2.7 Policy relating to Emergency Services:

The Policy relating to Emergency Services include various aspects like ambulance services, registration and records, investigation and management, admissions and referrals, and medical legal issues etc.

The ambulance service is a very important service in saving the life of the patients. It is the primary duty of the emergency department to provide this service. It is a vehicle for emergency care which carries equipment and patients for optiomal emergency care at the scene and during the period of transportation to afford maximum safety and comfort to avoid aggravation of the condition of patients. It is very important that the speed of transfer of a patient from the place of accident or emergency to the treatment centre is vital in saving life and minimising the rate of death. The ambulance should consist of facilities for life saving equipments like oxygen cylinder, ambubag, endotracheal tube and air ways, foot operated suction machine, portable ventilator, immobilising splints, emergency drugs and medicines etc.

Proper communication facilities with two-way system should be provided to facilitate the ambulance to reach the emergency department without delay and in providing necessary health care to the patient. The ambulance services can be clarified into two types i.e. urban and rural depending on the conditions of the road, distance to be covered, and differences in the location etc. While planning ambulance services, necessary precautions should be taken on the basis of above factors.

Another important aspect of emergency department is to develop and implement a simple and accurate system of registration of patients who are to be brought into emergency department. Now-a-days in many of the corporate hospitals, computerised systems and procedures are followed. However, lengthy procedures and formalities should not be implemented in case of this department. In medical and legal cases, the registration formalities and procedures should not come in the way of commencement of the treatment. Even the courts are of the view that the patients should not be

subjected to inconvenience because of the lengthy procedures. The department should be careful in providing the medical services as the Consumer Protection Act 1986 is made applicable to the hospitals and health services. The details in the emergency department records include personal details, date and time of arrival of the patient, major complaints, examination results, basic investigation and their indication, diagnosis, time of discharge, referred etc., These records should be maintained for a minimum period of two years. The record of medico legal cases should be retained by the hospital and should be entered in a medico legal register for safe custody. The investigation reports, test reports should be retained permanently.

Today it is important that many of the patients who are brought into the department require urgent and necessary investigations before the commencement of the treatment. As such an emergency laboratory unit and radiology department should be located near the emergency department. Facilities for ECG and arterial blood should also be provided to the patients in the department. The results of the investigations should be immediately entered in the records of the patient in the department. One copy of every record in the department should be kept under safe custody.

The admissions and referrals play an important role in providing proper treatment to the patients in the hospital. A record should be maintained with details of medicines, fluids and drugs given to the patient. In case of specialist treatment by various consultants, their opinions on the diagnosis should also be properly recorded in the register. In some cases, the patient should be kept under observation. In case of such a situation, the vital parameters should be recorded along with the time of recording. If the patient cannot be treated as outpatient and needs admission, a suitable record with details of admission number, date and time of admission; bed number, ward and the department, etc., should be maintained. The case sheet of indoor patient should be retained in the records department of the hospital. In case of reference to another hospital, it shoudl be ensured that the patient condition is stable in case of temperature, blood pressure, heart beat, and sugar etc., In case of any critical condition of the patient, a doctor may be deputed to accompany the patient to the hospital referred.

The emergency department in any hospital in India is normally filled up with patients who are brought in medico legal cases. If the case involves medical examination by the doctors and investigation by police, such cases are known medico legal cases. The incharge medical officers of the emergency department have to decide whether the case can be referred to as medico legal or not. The medical staff including doctors and nurses working in the Emergency Department of a Government hospital have the obligation to register, examine, and treat all medico legal cases brought into the department. The reports of injury should be prepared and documented in the register of medico legal cases and necessary communication should be sent to police department. However, the treatment should not be affected because of medico legal formalities as has been enunciated by Judgments of various courts in India.

2.8 Evaluation of Services:

The accident and emergency department is to be properl monitored and evaluated to improve the services. As it is regarded as the most important and life giving department of the hospital, it should be ensured that the most efficient and effective services are available to the community. For the purpose of evaluation of this department, continous data on various aspects like number of patients brought into the department, number of patients treated as outpatients, number of patients admitted into hospital, seasonal differences in the admission of patients, differences in the hours of admission, number of cases referred to other hospitals, and number of cases who lost their lives etc., For the purpose of evaluation, a proper checking of records is necessary. The records are to be verified with reference to their completeness, adequacy, accuracy, correctness, errors in diagnosis and the causes of complications leading to death of patients etc.

The review of these records may be taken up by a Review or Audit committee which consists of senior consultants belonging to different disciplines like medicine, surgery, paediatries, and few members from a hospital administration and records. The Committee should meet at regular intervals and take necessary measures to imporve the services of the department. Another important measure to improve the services of the department is to instal a Complaint cum Suggestion Box in which the patients and the visitors may drop their problems and these boxes should be kept at important places. A senior faculty or member may be kept incharge of this box and this box may be opened at regular intervals to take necessary steps to improve the medical services. Important persons in the society may be involved in solving the problems of the patients.

2.9 Conclusion:

The Emergency and Accident Services department play an important role in providing health care services. As very important department of any hospital, this department should be properly located to the entrance area of the hospital, provided with adequate staff with skills, equipment inter modern uses, a proper policy for the treatment of patients, adequate and necessary steps to redress the complaints etc., As the accidents have been increasing because of various indentified and non-identified resons, the department should be improved keeping in view of the increasing patient loads.

2.10 Self assessment Questions:

1. What is a Medical Emergency. Explain the role, functions and types of emergency services of hospital?
2. Elucidiate the considerations to be kept in mind in case of planning, staffing and equipment requirements of Emergency Services?
3. What are the various policy issues relating to Emergency Services?
4. Suggest measures for te evaluation of the emergency services of a hospital?

2.11 Key Words:

1. Emergency - is a situation when the patient requires urgent and high quality medical care.
2. Accident - an unexpected, unbalanced event which involves injury or damage to life or limb.
3. Stand by emergency service - a service undertaken in Primary Health Centres and Community Health Centres.
4. Ambulance Services - a vehicle for emergency care.

2.12 Further Readings

1. McGibory - Principles of Hospital Administration
2. Rowland and Rowland - Hospital Management - A guide to Departments.

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Lesson - 3

OPERATION THEATRE

3.0 Objectives:

The objectives of this lesson are
to explain the need for planning an operation theatre,
identify different types of operations normally performed in any hospital,
factors to be considered in the design of operation theatre,
and discuss the policy and procedural issues involved in the operation theatre etc.

Structure:

3.1 Introduction:

The operation theatre in a hospital is the most vital facility of service which has an obligation to bring back life in many cases. The operation involving giving birth to a baby, operation to remove infected and damaged parts of the body, operation for heart problems and operations involving minor injuries to major fractures are some of the examples which explain the need for a proper operation theatre with latest equipments and technology along with skilled medical personnel. Hence, a proper plan is necessary to provide a healthy, hygiene and fully equipped operation theatre in any hospital.

3.2 Need for planning an Operation Theatre:

The activities being performed in this department can make or mar the reputation of the hospital. In fact, for the entire hospital services, services provided by doctors, and nurses and other staff in the operation theatre are very much critical and crucial. Any bit of negligence in the operation theatre results in heavy penalty for the hospital as well as the patients and their families. Hence, it is therefore imperative that a detailed planning should be done on scientific basis while designing operation theatre in order to ensure effective functioning of the department.

3.3. Types of Operation:

The traditional way of clarification of types of operations was minor and major categories. Though this clarification is used by common man, the people in the medical field and policy makers have raised certain objections. The statistical data provided on the basis of this classification did not produce any meaningful results. Hence this classification was dispersed with. Another way of classification is emergency and elective. Emergency operations are those which must be carried out as soon as possible after the diagnosis has been made. The patient will be prepared for the operation in a systematic way. The activities of preparation for operation include information to patients and their relatives, obtaining a declaration, providing proper medicines and food before operation, and counselling the patient etc., The emergency operation may be conducted for both admitted patients and those patients who are brought from outside and are admitted as urgent cases. In case of operation, the surgeon in charge has to take an appropriate decision depending on the conditions of the patient. Some times, the operations have to be postponed in the last minutes because of sudden changes in the health conditions of the patient. Contrary to emergency, elective operations are carried out some time after the diagnosis has been made and when they suit best for the patient and doctor. There has been many advances which have taken place recently and are regarded as surgical specialities or super specialities which requires the operation theatre to be equipped with specialised equipments. These include Micro surgery, Cryosurgery, Laproscopic surgery, Bio-medical laser etc., A micro surgery is performed under magnification, a cryosurgery is based on use of liquid nitrogen at a very low temperature, a laproscopic surgery is done with the help of a laproscope, and in case of Bio-medical laser, there is absence of physical contact and the cutting is without mechanical pressure which makes the operation non-traumatic and the risk of infection is less.

3.4 a) Factors in the design of operation theatre:

The major objectives of an operating department are to:

- promote high standard of asepsis
- ensure maximum standard of safety for patient and staff from a various hazards like environmental, anaesthetic, radiological and post operative etc.
- Utilise the time of theatre and staff in an optimum way.
- provide comfortable treatment for patients.
- allow flexibility in the use of rooms.
- ensure good working conditions for the surgical staff.
- improve the psychological strength of the patients.
- achieve high image for the department and the hospital.

b) Bases of Planning:

The following may be considered as the bases for planning operation department of a hospital. The different bases are designed in such a way that they consist of functional, professional and technological requirements of the hospital.

The different bases may be explained as under:

i) **Functions performed:**

The operation department has to perform many functions which are inter-related, complicated, and psychological. The inter-related aspects include activities to be performed before and after the operation and this requires the services of anaesthecian, radiologist and other technical staff of other departments like blood bank, ambulance service etc., Some of the operations are complicated as regard to the age, diseases and other complications that are likely to arise during the course of operation and after operation. The Psychological or educative and informative aspects include providing information to the attendents of patients about the condition of the patient from time to time.

ii) Flow of work:

The flow of patients, supplies and staff in the operation department is to be preplanned. Depending on the expected flow of patients, supply of medicines, equipment, beds, arrangements in the blood bank and other material has to be planned. The staff in the operation theatre is another important aspect which has to be carefully planned. The number of doctors, assistants, nurses and other technical staff required for the department is to be preplanned and arrangements shall be made accordingly.

iii) Environmental related:

While planning operating department, the environmental aspects should also be considered for the safety and comfort of the patients and staff. The surroundings of the department should be kept free from pollution, noise and other disturbances etc.

There are a number of activities which are required to be performed by the operating department. An analysis of these activities is necessary to design an operation theatre for the fulfillment of the objectives.

These activities may be grouped as under:

1. Core or main activities related to operation or patient
   - ✡ Reception and identification of patient
   - ✡ Pre-operative care of the patient
   - ✡ Defilation of patient
   - ✡ Movement of patient to operation table
   - ✡ Application of anaesthesia
   - ✡ Intubation
   - ✡ Positioning
   - ✡ Preparation of the area of operation and surroundings
   - ✡ Drafing of patient
   - ✡ Activities like blood transfusion, parenteral fluid administration and x-ray examination.
   - ✡ Dressing up of operated part of the body
   - ✡ Removal of Drapes
   - ✡ Extubation

- Shifting of patients from operation table to wards or rooms
- Post operative supervision of patient

2. Activities related to staff of the hospital.
   - Change of dress, shoes etc.,
   - Wearing cap, mask
   - Putting on gloves and apron
   - Aseptic washing of hands and Gowning
   - Checking No. of instruments to be used for operation
   - Psychological and Physical preparation.

3. Activities related to administration:
   - Preparation of lists and duty schedules
   - information to patients
   - notification to different wards, ambulance services and other departments
   - preparation of records, equipment and material
   - Ascertain availability of doctors, and staff for emergency assistance
   - preparation and filing of operation records

4. Activities related to house keeping:
   - collection of used instruments, materials, dressings etc.
   - cleaning of operation rooms and other areas
   - disposal of refused materials
   - repairs and maintenance of equipment

3.4 (c) Location, Size and Number of Operating rooms:

The location of the operating rooms is influenced by the number of rooms to be provided. The location of the operation theatre can be conveniently located at the ground floor as location on other floors adds to design and communication problems. However, in practice, the operation theatres are usually located on higher floors in a multistory building to minimise the general traffic and better maintenance of asepsis. This department should be easily accessible to the sterile supply unit, emergency department and surgical wards. It should not be effected by sun, heat, noise, dust and wind problems. It should also consider other factors like cross infections, solar radiations, and easy access to ICU, x-ray, laboratory, blood bank, emergency ward and surgical department. The department should be provided with facilities like piped suction, medical gases, electric supply, heating, air-conditioning, ventilation and lift services. A separate small building may be constructed for this department which will help in future expansion without causing disturbances to other departments of the hospital. An operation theatre is to be located at a height of 4.2 metres (apprely) because of the requirements of the modern operation theatre. If there is only one multi story building, the operation theatre should be located on top floor of the building because of the ease in providing more height. A dedicated air handling unit for fresh air could be provided on the terrace of the multi story building.

The size of the operating room depends on the type of surgery performed in the department. For a general operation, the requirement is 40 sq. metres. Specialised types of surgery like cardio-vascular, Neuro-surgery, Orthopaedic etc., require a minimum clear area of about 60 sq. metres. In some cases, additional adjoining rooms to the main operation theatre may be needed for keeping heart lung machines, and other equipments. Additional space is required for splint and traction equipment in case of orthopaedic surgery. Endoscopic room requires procedure room with minimum area of 20 sq. metres, de-contamination room and patient preparation area etc.

The number of operating rooms required for an operation depends on a number of factors like

- Number and types of surgeons available
- Type of hospital
- Policy and procedures of hospital
- Number and nature of surgeries expected
- Number of operations per day
- Expected average stay period of patients
- Expected turnover interval in theatre
- Size of an average theatre list
- Estimated time for cleaning of theatres
- Time for staff breaks
- Time reserved for emergency patients
- Allowance for septic patients.

The number of operation rooms and number of operations per day can be calculated with the help of the formula which can be stated as under

$$\text{No. of operations per day} = \frac{\text{No. of Surgical Beds x \% of BOR x 365}}{\text{ALSx100xNo. of working days of the hospital}}$$

BOR - Bed occupancy rate
ALS - Average length of stay.
(Source:Macanlay. "Hospital Planning and Administration")

The number of operation theatres required for an hospital depends as the number of surgical beds. In different countries, the rates of surgical beds to operation theatre is differently determined. In the American context, the ratio is one operation theatre for every 25 surgical beds where as in case of European Countries, one operation theatre for every 50 surgical beds. In the Indian context, the committees suggested the European pattern. The operation theatres include minor and major for both indoor and outpatient department. A committee on the number of minor and major theatres recommended that 2 minor and 8 major operation theatres are required for an hospital which consists of 750 surgical beds. In case of the same hospital one major and one minor operation theatre is required for outpatient department. The guidelines differ according to

the number of surgical beds in the hospitals. In addition to these, additional facilities are required to be provided.

As it has been observed that an hospital requires number of operation theatres, the theatres may be centralised in one area so as to obtain various advantages of location like

- Maximum flexibility in use
- Better chances of expansion
- Improve efficiency of theatre staffing
- Economics in common facilities
- Easy and economical maintenance
- Better sterilization facilities
- Reduces infection and uses infection
- Improve better utilisation of operating theatres.
- Reduces cancellation of operation schedules

The grouping of operation theatres depends on a number of factors and in different countries, the practices differ. For example: In Germany, 6-8 operation rooms are grouped, and in Sweden, 8-10 operation rooms are grouped. Any operation is to be performed under most aseptic conditions. For this purpose, the operating department is to be divided into four district zones. They are protective zone, clean zone, sterile zone and disposal zone. In each of the zones, separate facilities needs to be provided. The description of zones and their facilities, can be presented as under:

1. Protective Zone:

In this zone, facilities like reception, waiting hall, dress changing room, pre-anaesthesia room, store room, auto clave, Trolley Bay, and control area of electrcity etc. should be provided.

2. Clean Zone:

In this zone, facilities and services like pre-operating room, recovery room, theatre work room, plaster room, x-ray unit, staff room and a store room for anesthesia should be created.

3. Sterile Zone:

In this zone, facilities like operating room, scrub room, anaesthesia room, instrument sterilization and instrument trolley area should be made available.

4. Disposal Zone:

This zone should consist of facilities like dirty wash up room, and disposal corrider room etc.

The benefits of the creation of these zones are:

- reduce the risk of infection in hospital
- minimises unproductive movement of staff, patients and supplies
- increases efficiency of staff
- reduce hazards in operation theatres
- ensure proper positioning of equipment
- proper utilization of operating theatres.
- encourages smooth flow of work

3.4(d) Uninterrupted Electricity:

Any operation theatre (whether major or minor) requires a continuous flow of electricity during 24 hours of the day. Any disturbance will affect the functioning of the department and effect the image of the hospital. A continuous supply of electricity is to be ensured for the department. If the power supply gets interrupted during operation or when the patient is on ventilator, or on any heart lung machine, power supply should not be affected even for a fraction of a second.

The mechanical and electrical equipment also requires continuous repair and maintenance. Hence plan should be made in such a way that in case of any repair or maintenance, alternative arrangements should be made immediately from alternate sources. While laying down the electricity cable, it should be ensured that the electrical points of operation theatre are distributed between two or more distribution boards. Any repair and maintenance of the board will not effect the supply of electricity for operation theatre. Operation theatre should also be provided with stand by generator and UPS for the continuous power supply. Another important component of operation theatre is lighting. A proper light and ventilation is necessary with the help of which the surgeon is able to perform the operation. The guidelines relating to lighting and ventilation are as under:

- the central field of operation luminance should be 2000-3000 candles per metre square
- wound surrounding area luminance ratio should be 2.5:1
- Floor around surgical table should be 200-300 candles per metre square and walls 300-500 candle metre square.

The instruments, clothes of operating room should be selected to avoid glare. The colour composition of the room should be such that the anaesthetist will be able to see the colour changes of the patient skin. There should be co-ordination among the operating light, complimentary lighting and colour scheme of the room, cloth etc.

In providing electrical support to the operation theatre, operating light is another essential required facility. While selecting a operating light, the following factors should be considered:

i) easy maintainability, repair and maintenance
ii) intensity of 1,00,000 lux
iii) flexible fitting
iv) quick and accurate control
v) steady
vi) shadow less

Any operation theatre requires electro-medical equipment for life support and to perform surgery. All these equipments are dependant on stable electricity. For this purpose, power outlets at convenient location are needed. In the operation theatre minimum four power outlets of duplex type should be provided on every wall of the operation theatre. Six power outlets are required near the location of the Anaesthetist. However, for the proper functioning of electrical equipments, stable voltage and frequency electrical current should be supplied in the operation theatre with the help of UPS in the operation theatre complex.

3.4 (e) Air Conditioning and Ventilation:

It is the primary duty to provide high standard of asepsis and proper environment in the operation theatre with high quality air conditioning and proper ventilation system of positive pressure with different gradients. Today many of the complicated operations are being performed in the operation theatre like transplantation of heart, kidney, etc., which require long hours. Hence, any type of infection causing to the operated patient has to be avoided at all costs. These surgeries require environment which is very conducive to patient, staff and equipment apart from providing microbes free environment. This can be provided if the planner and air conditioning consultants along with surgeons are involved in decision making in the aspects relating to air-conditioning and ventilation.

Air handling unit is another facility to be installed in the operation theatre. This is the place where the chilled water comes into contact with the air and cools it to the desired level. The treated air passes through different filters and the clean air is discharged into the operation theatre. In case of complicated surgeries like neurosurgery and kidney transplantation the surgeon requires 100% fresh air. In other cases, some recirculated air is also accepted. In many cases, a temperature of 22°c (± 2°c) and humidity level of 55% (± 5°c) is required to be maintained for achieving the optimum environment.

3.4 (f) Outlet facilities:

The operation theatres should be provided with outlets for oxygen, nitrous oxide, suction and medical air etc. The guidelines for these outlets are also provided. For ex: For a general operating room, 2 oxygen, 2 nitrous oxide, 4 suction and 2 medical air outlets are required. For post operative room, 1 oxygen, 1 suction and 1 medical air outlets are required.

3.4 (g) Service Pendents:

This is a minor aspect but important from the view of surgeons. For the free and flexible movement of surgeon team, no wires should be lying on the floor in the nearly places of operation table. Therefore certain hanging fixtures are provided in the operation theatre. These are known as service pendents. Three designs are available in case of service pendents viz., fixed length service pendent, telescopic service pendent, rotating type pendent etc.

3.4 (h) Structured Cabling:

The hospitals require reliable net work for faster access to information. This can be achieved through structured cabling which consists of adaptability, flexibility and logitivity of net work etc. As Tele-medicine has become one of the most important aspects of medical field, structured cabling is a necessity and should be planned well in advance. Now-a-days a number of companies are available who can provide the structured cable service to the hospitals.

3.4 (i) Wash rooms and sanitary installations:

Facilities like wash room, sinks and provision for the passage of sewage shaft are also required to be provided in the operation theatre and in connected rooms. Plumbing fixtures and lines should not be provided above the operating theatre because of the problems like leakage and

contaminations. These are to be provided in the change rooms provided for the doctors, female staff and other staff. Standard height of the wash room should be 91.5 cm and the sink should be 96.50 cm.

3.4 (j) Other facilities and equipment:

Any operation theatre is to be provided with facilities like:

- fire fighting equipment
- hard, robust, washable and de-contaminated floors and walls
- a ceiling with a minimum height of 2.9 to 3.05 metres
- a clean room with high efficiency particulate air filters (HEPA)
- main door with 1.5 metre clear width with 2 leafs and the minimum height of the door should not be less than 2.13 metres.
- operation table with a convenient insertion of x-ray cassettes
- Microscope with remote control
- Mobile equipment like anaesthetic apparatus, x-ray equipment, ventilator, heart lung machine, and pulse monitor etc.

3.4 (k) Staff:

For any routine surgery, a team of 4 to 7 persons are required. The team consists of surgeon, anaesthetist, assistants to help the surgeon, and 3 nurses separately for scrub, circulating and anaesthetist activities. In addition to this team, four assistants are required viz., radiographer technicians, sterilising staff and disposal staff. For complicated surgeries, the number of staff required may be 20.

3.5 Policy and Procedures:

The policy and procedures relating to the operation theatre should be carefully planned and implemented so as to provide satisfaction to the patient and improve image of the hospital. The components of policy and procedures relating to operation theatre should include the following:

i) There should be no wastage of operating time of the surgical team and to avoid over-crowding of the operation list resulting in the postponement of operations.

ii) The administration of operation theatre an energetic theatre matron, a disciplined chief surgeon, and anaesthetist and a well motivated para medical staff.

iii) Punctuality should be maintained in the schedule of operations.

iv) The theatre staff should be trained on all aspects relating to the operation and its allied activities.

v) In the case of outpatients who visit the hospital for minor surgical procedures like dressing, change of plaster, etc., they should be treated immediately and should not be kept wait for long hours for attending to these minor procedures.

vi) The timings should be adhered to while transporting patients from and to the ward depending upon the time of operation.

vii) The operation theatre should be provided a day in a week for normal maintenance.

viii) Life saving equipment needs to be located in different places in the hospital. If the equipment is not working in the operation theatre, the equipment situated in other places can be made use of at the time of emergency.

ix) The staff who are affected by infection should not be permitted in the operation theatre.

x) Post operative infection rate, anaesthetic death rate should be documented and reviewed.

xi) Air conditioners, filters, outlet facilities, sterilisation equipment etc., should be checked thoroughly and they should be properly maintained.

3.6 Evaluation of operation theatre:

Generally the patients and the public evaluate the services of operation theatre on the basis of success rate of surgeries in the hospital. The pre-operative care and post operative care are considered as the important parametres in the evaluation. The surgery being performed in case of critical and complicated cases and the result of such surgeries will also be considered for evaluation. Attendants of patients expect the information on the condition of patient from time to time. Hence the staff in the theatre should provide information without showing their anger, inconvenience etc., The team of surgeons, their qualifications, experience, expertise, equipments and other facilities provided by the hospital will be considered for evaluation of the operation department. The image of any hospital will be largely influenced by the operation theatre department since this department will provide rebirth in many cases.

3.7 Conclusion:

It was established that the operation theatre play an important role in mproving the image of the hospital. Hence, there is a need to properly plan the various aspects of operation theatre department. The location, size, number of rooms, facilities, equipments, and staff etc. are the most important elements in case of the operation theatre department. The policy and procedures relating to the operation theatre should be clearly laid down and implemented. It is most important, that the image of the hospital depends on the success rate of the operations. Hence the operation theatre should be properly planned and organised.

3.8. Self - assessment Questions:

1. What are the factors to be considered in the design of a operation theatre.
2. Explain the need for planning an operation theatre and discuss bases of planning.
3. Elucidate the policy and procedures relating to operation theatre. How do you evaluate the services of an operation theatre.

3.9 Key Words:

1. BOR - Bed Occupancy Rate relating to number of operation rooms
2. ALS - Average Length of Stay which influence the number of operation rooms
3. Zones - Division of operating department into zones.
4. UPS - Uninterrupted Power Supply
5. Pendent - Hanging and related to the free movement of team in the operation theatre
6. OT - Operation Theatre.

3.10. Further Readings:

1. Golman J.W. "How to Determine optimum number of Operation Theatres" "Modern Hospital" 1969 vol.III, No.3
2. Guidelines for Construction and Equipment of Hospital and Medical Facilities 1992-93.
3. Study Material 'PG Diploma in Hospital and Health Management, Academy of Hospital Administration.

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Lesson - 9

STERILE SUPPLY SERVICES IN HOSPITALS

9.0 Objectives

After going through this lesson, you should be able to:

Understand different terms used in relation to the sterile supply services in hospitals,
The aims and objectives of sterile supply services in hospitals,
Physical facilities required for such a service or planning and design considerations for a CSSD,
Various methods of sterilisation, its usage, advantages and disadvantages,
Equipment and manpower planning for such services operating policies and procedures, and methods of quality control of CSSD.

Structure

9.1 INTRODUCTION

In this unit, you will learn the process of sterile supply services to the wards and various departments such as operation theatre, out patients department and so on. Studies in United States have identified the nosocomial infection rate to be 3% in 1997 with a cost of 1 billion dollars. Authentic information regarding the magnitude of the problem in our country is not available. However, rough estimates vary from 5% to 25%, prolonging the hospital stay of the patient and increasing their hospital bills.

Discovery of causation and transmission of disease by micro organisms led to the development of aseptic techniques and sterilisation process. In the year 1928, the American college of Surgeons initiated centralisation of all surgical supplies and dressings in one unit for supply to all departments of the hospital. Thus, the concept of Central Sterile Supply Department (CSSD) started and became a major tool for the reduction of hospital acquired infections

Centralising the functions of Sterile Supply Department has the following advantages:

* sterilization processes are carried out by well trained personnel
* Uniform Sterilisation processes for all hospital units
* Facilitates quality control of supplies.

9.2 OBJECTIVES AND SCOPE OF CSSD

CSSD provides all departments with an adequate supply of sterilised materials from a central source where safe sterilisation is conducted under controlled conditions at minimum possible cost to reduce the infection rate in a hospital.

Objectives

To provide on line supplies of sterile instruments, linen packs and other sterile items as required for patient care.

To maintain accurate record of effectiveness of cleaning, disinfecting and sterilisation process

* To monitor the quality of sterilisation.
* To maintain adequate inventory of supplies and equipment.
* To provide a safe environment for patients and staff.

CHECK YOUR PROGRESS 1

What do you understand by CSSD and state it's objective?

.....
.....
.....
.....

Scope

The scope of service vary from hospital to hospital. The items are either stocked at the CSSD or at the central stores from where these are issued to the users. The user department send these to CSSD for sterilisation or further issue to the department for reuse. With the use of more and more pre sterilised disposable items, the scope of CSSD is gradually declining. Normally the following items are catered for by the department:

Needles and glass syringes
Rubber goods(Rubber gloves, catheters and tubing)
Treatment and diagnostic sets and trays (lumber puncture, sternal puncture and paracentesis sets)
Dressing
Otline and instruments
Intravenous sets
Theatre Sterile Supply Unit (TSSU)

Some hospitals have a sterile supply unit as an integral part of operation theatre. These are known as TSSU. These units may be in addition to CSSD to cater to the emergent requirement of operation theatre or when the requirement of sterile supply is so large that necessity is felt to provide additional unit. In small hospitals where major work pertains to operation theatre and requirement of sterile supply to the department is bare minimum, there may only be TSSU or CSSD itself is integral to operation theatre.

9.3 PLANNING AND DESIGN

While planning the CSSD unit, the following design aspects have to be taken care of;
Structure and Location
The CSSD should be located in close proximity to the area it serves and to the areas that serve it for efficiency of function. Major users of the service are operation theatre, labour room, causality and the wards unit. With this in view, the CSSD should be located near the OT complex or in close proximity to the areas. Since the major requirement of CSSD is of steam, the availability of boiler service near by is also necessary. As a rule of thumb, the following location is preferred:

Hospital of 100 beds : CSSD in OT

Above 100 beds : CSSD in service area

Above 500 beds : CSSD in service area and TSSU in OT

Layout

The functional areas in a CSSD should be so arranged that equipment and materials progress in a logical sequence from receipt of contaminated and used items to sterilisation, storage and issue of sterile items. There should be no mixing of sterile items. To achieve this, the division as under should be planned.
Organisation : Following activities are important .
Disinfection
Chemical disinfection to be used for heat/ labile items:

* Thorough cleaning prior to disinfection is necessary.

Disinfectants must be carefully diluted to manufacturers specifications. Monitoring of disinfectants used should be carried out at a specified lab.
Indicator strips to test the activity of 2% glutaraldehyde should be used prior to insertion of instruments.

Heat disinfection for clean solid steel items only.
Boilers must have a functional thermostat, a time lapse lock and thermograph
Washer disinfector used for cleaning and disinfection prior to sterilisation should be monitored by internal thermostats.

Accurate record keeping for the above monitoring systems must be carried out and periodic checks must be done.

Space Requirement
As a general guide for a hospital of up to 400 beds, an area of 1.64 sq. m/bed will be required for CSSD. For a hospital with >400 beds, area of 1 sq..m/bed will be required. The total area needs to be divided to provide the following facilities:

Facilities	In Sq. Meters
Entrance	10.50
Lockers	7.00
Staff change room	7.00
Dirty receipt and disassembly	7.00
Washing, disinfection and decontamination	17.50
Asssembly	10.50
Linen processing	10.50
Sterilisation	14.00
Sterile Storage	21.00
Distribution	10.50
Trolly wash	7.00
Trolly bay	10.50
Bulk store	10.50
Duty room	17.50
Toilet	3.50
Total per 100 bed hospital	165.50

Equipment in CSSD
Equipment mentioned as under should be provided in the CSSD unit.

* Cleaning and decontamination devices
* Hot air ovens for instrument drying and dry heat sterilisation
* Glove Processing unit for processing of surgical gloves
* Instrument sharpeners
* Steam, dry heat, gas or chemical autoclaves
* Testing apparatus for efficiency of sterilisation
* Others – Trolleys, work surfaces, maintenance and repair equipment, telephones.

Cleaning and Decontamination Devices: The cleanup or wash area needs to be provided with counter top work surface made up either of stainless steel or of some easily washable hard material such as kota stone. These are to be fitted with large size sinks with foot operated taps.

Glove processing Unit: The unit is available for glove sorting, washing, testing, powdering, packaging and finally sterilisation. The glove room should be separate from other work areas so that powder does not contaminate other articles. The room should be properly sealed with rubber beading for the purpose.

Autoclaves: The common method in use is steam sterilisation for which sterilisers of varying capacity and type are available. Dry heat, gas or chemical sterilisers are also available and used depending upon the requirement. \Vacuum type steam sterilisers which are much more efficient

and require less time to reach the required temperature are generally used in the CSSD of the hospitals in India.

Testing Apparatus

Indicator tapes: Time, temperature and pressure sensitive tapes are available in the market. These tapes are put on the package. These do not indicate the sterility of items but merely indicate the items have been subjected to the required temperature pressure or have under gone the required time cycle of processing.

Bacteriological indicators: Several indicators are available which compare known population of thermophylic spore bearing colonies before and after autoclaving. These indicators are placed in the center of pack and after autoclaving are sent to laboratory for colony growth and count. The result is available after 24-28 hours.

Stock: In order to ensure continuous availability of sterile items to the users at least five times the average daily requirement should be available.

Organisation: The administrative head of CSSD should be an administrative person whereas technical head of the facility is a microbiologist. Under the administrative head, there are CSSD Managers and Supervisors who supervise the work of personnel working in the /CSSD. Normally, there are Two CSSD personnel per every 100 beds.

9.4 STERILISATION PROCESS

Sterilisation is a process of freeing an article from all living organisms including bacteria, fungal spores and viruses. Different types of sterilisation processes are in use in our hospitals. They are:

1.Heat Sterilisation:

By Steam
By Dry Heat

2. ETO Sterilisation

3. Chemical Sterilisation

4. Radiation Sterilisation

Heat Sterilisation by Steam

Steam destroys micro organisms by irreversible denaturation or heat coagulation or cellular proteins. Advantages of Steam Sterilisation are as follows:

* Economical
* Steam contains enormous energy in the form of latent heat
* Does not require purging fitness prior to use
* If used in a vacuum, penetration of steam occurs throughout the item.

Equipment
Two types of steam sterilisers:

Gravity displacement or downward displacement steriliser which displaces air from the chamber and load by gravity.

pre-vacuum sterilisers which removes air from the chamber and load by a vacuum pump. This is a more rapid method.

Controls
Air removal efficacy of pre-vacuum sterilisers should be regularly monitored. Controls carried out should be by means of micro-processors rather than manually.

Requirements of control System:
* Online data on all stages of sterilisation cycle
* Storage of data
* Diagnostic program for engineering services
* Automatic leak test cycle

Quality of Steam
* Steam should contain less than 3% moisture
* Steam at 0.92 to 0.95 % dryness is best for sterilisation

Steam supply pressure should be checked weekly by preventive maintenance department
* Regular weekly preventive maintenance to be carried out

To avoid contaminated steam from entering steriliser, steriliser should not be operated during boiler below down.

Material Compatibility

The effect of steam on all material to be sterilized should be assessed in terms of corrosion, flexible properties, impact resistance, tangible properties, comprehensive strength, burst strength, tear strength, colour, permeability and optical transmission. This should be documented.

Preparation of Items for Sterilisation
* Rinsing
* Cleaning
* Inspection and Assembly
* Packaging
* Labeling

Loading

All surfaces of items must be directly exposed to steam. All items must be opened and dis-assembled. Care should be taken to allow adequate room for all items to allow steam penetration and circulation.

Operation
Manufacturers guidelines must be strictly followed. Each type of steam steriliser is designed to achieve specific cycle parameters, usually 134 Degree Centigrade for 3 minutes or 121 degree centigrade for 15 minutes.

Unloading and Cooling
Load should be left in the steriliser until all steam has escaped and items are cooled. Cooking items should be placed separately on wire mesh racks and handled only when entirely cool.

Record Keeping
The following documentation should be maintained for a period of 2-3 years:

* Steriliser instruction manual
* Records of preventive maintenance, calibration and repair
* Loading records including contents of each load, duration and temperature of cycle, initials of operator, date, number and time of cycle.

Flash Sterilisation
Flash sterilisation allows quick sterilization of a device that is urgently required for reuse. Flash sterilisers achieve a temperature and pressure for sterilisation in minutes.

ETO Sterilisation
Ethylene Oxide (ETO) kills micro-organisms by altering the DNA of micro-organisms by the process of alkalation. ETO may be used undiluted or diluted with carbondioxide or nitrogen. ETO is supplied in small cartridges of 100% and large cylinders containing a mixture of 12 %ETO and 88% other halogenate hydrocarbons.

Sterilisation by ETO is done for those items which can not be subjected to heat sterilisation. Delicate surgical instruments such as cystoscopes, heart lung machinery, other electrical equipment and implants are sterilised by this method.

Containment Area
ETO sterilisers should be located at a place physically separate from other work areas. This area must be large enough to ensure ETO dilution and provide adequate space for loading, unloading and maintenance of steriliser and aerators.

Preparation of Load
All items to be sterilised must be thoroughly cleaned.

Humidification
* all areas utilised for sterilisation process must have humidity of 35-70 %.
* All moisture must be wiped from items to be sterilised.

Moisture content of the steriliser and packaging is important to facilitate penetration of ETO.

Packaging
Packaging material should be highly permeable to ETO and air. Paper should be used for packaging. Before sealing, all excess air should be removed to avoid bursting. All instruments should be placed in perforated trays or wire mesh bottomed trays

Operation
Manufacturer's instructions should be followed. Common exposure conditions are 37 to 60 Degrees Centigrade, exposure time 105 to 300 minutes and chamber humidity of 45 to 75 %.

Precautions for Safety
* ETO is a toxic gas.
* Permissible exposure level of ETO is 1 ppm/ 8 hours.
* Personal exposure to ETO should be minimised.

The apparatus must be handled by well trained technical persons.

Sterilisation by Dry Heat
This is carried out for items such as cutting instruments, Vaseline gauge etc. in which steam can not penetrate adequately. Uniform heating of items is achieved by means of a fan for forced air circulation.

Time and temperatures used in hot air sterilisation are;

160 degrees centigrade for 60 minutes

170	"	40
180	"	20 "

Equipment
Indian standards IS 3119- 1978 provide guidelines regarding specification of hot air sterilisers.

* Sterilisers must be automatically controlled.

* Steriliser door should have automatic locking system

A thermometer should be provided along with the temperature chart recorder.

* A lockout system should be installed to prevent overheating

Precautions
* Steriliser should have interlocked doors. Door should be opened only when cycle is complete.
* Chamber should not be over filled

Good thermal contact must take place between load items and their containers which can be wrapped in aluminium foil to facilitate this.

Radiation Sterilisation
This is the most effective method of sterilisation. Gamma rays provided by a source such as cobalt 60, caesium 137, or Electron beam generated by Linear Accelerator. This process is already being employed by ISO MED at BARC for bulk sterilisation of disposable items. This method can not be employed at the hospital level due to high cost of equipment and safety standard requirement.

Advantages
* Reliable
* Can penetrate all types of packing
* Large and diverse shaped articles can be sterilised
* There is no residual radioactivity

Disadvantages
* Glass becomes dark
* Cotton loses tensile strength
* Food may get undesirable flavors
* Not suitable to hospitals.

9.5 OPERATIONAL CONSIDERATIONS

Functional Activities
Rinsing, cleaning and drying must be done properly by trained personnel. Each item must be inspected for functionality before issue. Proper packaging and labeling must be carefully done indicating the date time and contents that are free from breakage's and defects.

Distribution Systems
The systems in use are;

Milk Round System: It includes daily filling up of each operation theatre and ward stock levels to a predetermined level. If one round is made, stock provided may be 50 % extra and 25 % extra in case two rounds of distribution is made.

Grocery System: Wards send requisition to CSSD and stock is supplied accordingly.
Clean for Dirty Exchange System : One fresh item for one used item is issued.

Operating Policies
A standard manual of policies which include staff deployment, operating procedures, maintenance of equipment, storage, receiving and issuing of items, operating schedules, sterilisation, packing and labeling procedures should be laid down. Personnel must be trained on a continuous basis in order to ensure quality support from the department.

PERFORMANCE EVALUATION
Monitoring of sterilisation and disinfection processes should be under the guidance of a medical microbiologist.

Recycling of disposable items should be controlled by hospital inspection control committee.
* Recommended standards for monitoring equipment should be met.

* Wet packs must not be accepted as sterile

9.6 MANAGERIAL CONSIDERATIONS

Proper planning should precede the activities of the department as these are highly technical in nature.

There must be a preventive schedule for maintenance as per the manufacturer's specifications.

* Inventory Management
* Inventory management should identify;
* Items required
* Reorder levels
* Quantity to be ordered
* Schedule of ordering
* Cost of items
* Approved brands or companies in each product
* Frequency of shortages
* Frequency of over stocking

Budget Considerations

* Measurement of demand for the Hospital
* Capital cost can be obtained by considering;
* Physical space
* Processing and sterilisation equipment
* Investment on instruments
* Expenditure of consumables, Packaging materials etc.
* Maintenance cost including labour cost, replacement cost
* Cost of inventory

9.7 SUMMARY

In this unit you have learned that with the increased awareness of quality of medical services and the availability of the state of the art medical technology, the challenges to the CSSD to provide appropriate sterile supplies has increased

You have also learnt that with improved effectiveness of CSSD, the rise in incidence of infections which result in length of stay, costs and mortality can be brought down. Further, you have also learnt that the scope of the CSSD has enlarged from that of an autoclave unit to a department that addresses the larger, vitally important issue of hospital infection control throughout the hospital

You learned about the planning and design considerations, operational considerations and sterilisation processes. In the end you have learnt about some of the managerial issues in CSSD inventory, monitoring and performance evaluation.

TECHNICAL TERMS

STERILISATION : Cleaning and Keeping an article free from all Living organisms including bacteria, fungal spores and viruses.

RECYCLING : Process of sterilising and reusing linen, operation theatre equipment etc., by hospitals according to accepted norms.

INVENTORY : All consumable items stocked in order to keep uninterrupted supply of required items

DISPOSABLES : Items that should be thrown out on single use. Reusing them cause infections to the patient

9.9 MODEL QUESTIONS

1. State the objectives of sterile supply services in hospitals?
2. Discuss the different methods used for sterilisation in hospitals?
3. What are the advantages of CSSD?
4. How do you evaluate the quality of sterilisation process?

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Lesson - 10

MEDICAL RECORDS DEPARTMENT

OBJECTIVES

After going through the lesson, you should be able to:

* Define medical record

Enlist the purpose of medical records in relation to patient, doctor, hospital and medical education and research: and

Comprehend the steps in planning and organisation of medical record department in a hospital

STRUCTURE

10.1 INTRODUCTION

Having learnt the planing and organisation of the CSSD in the preceding lesson, you have to learn another important area of hospital management i.e., Medical Records Department. First, you will learn about the definition of medical records including it's purpose, planning, organising and staffing consideration. You will also learn about physical facilities planning, procurement and flow of medical records. Further you learn about the storage and retrieval of records including functions and reports. In the end, you learn about the medico legal aspects of medical records

DEFINITION

The origin of medical records can be traced back to the British in 1667 at St. Barthlomew' s hospital followed by the practice of maintaining patients register in Pennsylvania Hospital in the US in 1752. Impetus to the idea of proper medical records in the form of standardized inpatients records came in USA from the American College of Physicians and American College of Surgeons in the first quarter of the 20th century.

In India, medical record keeping has not developed to the same extent as has been the case in the west. Bhore Committee (1946) first stressed the importance of keeping adequate medical records, which was reiterated by Mudaliar Committee in 1962. Subsequently, Health and Hospital review committees(Jain Committee and Rao Committee) highlighted the poor state of medical records in Indian hospitals and recommended the establishment of a proper medical record section in each hospital.

In accordance with the changes in technological advancement, the medical record keeping in hospitals undergone a rapid change over the last few decades. Now, Computers are being extensively used for record generation, analysis and retrieval. Effective methods like microfilming are being introduced for easy storage and retrieval.

A medical record is defined as a clinical, scientific, administrative and legal document relating to patient care in which sufficient data is recorded in the sequence of events to justify the diagnosis, warrant the treatment and results.

During the course of hospitalisation of a patient, the skills of many medical and paramedical specialists are utilised. They normally examine a patient, undertake required investigations and initiate the necessary therapy. Recording of the entire finding results in the medical records is necessary so that the record of the care and treatment given to the patient is available to the Doctors attending the patient subsequently.

A medical record therefore is;
A document of facts, which contains statements by trained observers of condition found and the application and the result of the examination and therapy.

It also contains whether or not the efforts of the doctors, supplemented by the hospital and related facilities are in accordance with the reasonable expectations of the present day's scientific medicine.

You might have had the experience of going through the medical record of a friend or a relative in the past. You might have observed the document arranged in the following sequence:

* Admission form
* Case sheet comprising of :
* Medical History
* clinical findings
* Investigation ordered
* Treatment initiated
* Progress reports
* Consent for surgery or specialised procedures
* Anaesthesia check record
* Notes on surgical procedure
* Lab reports in chronological order
* Films with their reports

Medical records for outpatients should also be prepared, processed and stored in the same manner as the inpatient departments. This is done in most of the modern hospitals attached to teaching and research institutions.

10.2 PURPOSE OF MEDICAL RECORD

The purpose a medical record serves is as follows:

FOR THE PATIENT
It serves to document the clinical story of the patient's illness and course of the disease.

CONTENTS

Lesson - 1

PERSONNEL MANAGEMENT

1.0 Objective:

On completion of this lesson, you should be able to understand:

* importance of Personnel Management
* significance
* definitions
* functions of Personnel Management
* objectives, qualities of Good Personnel Manager
* evolution and growth.

Structure:

1.1 Introduction:

Personnel Management is a comparatively new and rapidly growing profession in India. Employees 'on the job' inter-personnel relations is the primary concern of the Personnel Management. The main objective of an efficient personnel department should be supportive to the growth of an organisation. A Manager achives results through the people, by the people and for the

people. According to this statement, every Manager in the organisation is a personnel man and his objectives, aspirations, interest, fears, decisions, intelligence, creativity, innovation, loyalty, devotion, needs and the zeal to work in the organisation determine the ultimate success or failure of an organisation. Motivating employees, cultivating the desired habits, development of internal drive, inspiration, encouragement among the people are the job of personnel executives. Personnel Management is that part of management which is concerned with the human constituents of an organisation. Personnel Management is a science and art, which control labour and is also known by various names such as Labour Management, Man-Management, Personnel Administration, Industrial relations or Industrial Management.

1.2 Importance and Significance:

Realising the importance of Man Management, a leading industrialist of America remarked, "we do not manufacture automobiles, aeroplanes, refrigerators, radios, Televisions but we manufacture men and they, in tune, manufacture the goods". The aim of Personnel Management is to make the optimum use of Personnel Power of the employees and to get cooperation from one and all. Personnel Management is an approach, an established system, a technique and a philosophy of Management.

Significance:

During the recent years, people working in our industries have received growing attention for their well being. It has been realised that there is a need to maintain harmony between the two principal factors of production, namely, capital and work force. The efforts have been made to find a way out from the clash of interest characterised as present day personnel relations. The industrial harmony cannot be realised by sheer exercise of authority. It cannot be enforced from outside rather it must come voluntarily from within. To achieve this, there should be some real common interests among management and the workers.

Good industrial reactions are by far the greatest asset of an organisation. Labour in the unit of industrial production has an important place. Labour coordinates all other factors of production towards more production and lesser cost resulting in more profits. Personnel Management is that part of management which is primarily concerned with the task of managing the personnel and human relationships with an organisation.

1.3 Definitions:

There are number of definitions of Personnel Management. Some of the authorities on Personnel Management have defined in the following manner:

Edwin. B. Flippo states: "Personnel Management is the planning organising, directing and controlling of the procurement, development, compensation, integration, maintenance and separation of human resources to the end that individual, organisational and societal objectives are accomplished".

Dale Yoder states: "It is that phase of management which deals with the effective control and use of man power as distinguished from other sources of power".

E.F.L. Brench states: Personnel Management is that part of Management process which is primarily concerned with the human constituents of an organisation.

The Indian Institute of Personnel Management (now National Institute of Personnel

Management) observes that. "Personnel Management, Labour Management or Staff Management means quite simply the task of dealing with human relationships within organisation.

Lawrence Appley, former President of the American Management Association, has perhaps given the best possible definition of Personnel Management. According to him, "It is a function of guiding human resources into a dynamic organisation that attains its objectives with a high degree of morale and to the satisfaction of those concerned. It is concerned with getting results through people".

1.4 Concept of Personnel Management:

On the basis of the various definitions given above, a few basic facts and characteristics may be noted about Personnel Management.

First: Personnel Management is concerned with managing people at work. Such people or personnel does not simply refer to "rank and file employees" or "unionized labour " but also includes "higher personnel" and "non-unionized labour".

Second: It is concerned with employees both as individual as well as a group, the aim being to get better results with their collaboration and active involvement in the organisation's activities i.e. it is a function or process or activity aiding and directing workmen and women in maximising their personnel contribution.

Third: Personnel Management is concerned with helping the employees to develop their potentialities and capacities to the maximum possible extent, so that they may derive great satisfaction from their job. This task takes into consideration four basic elements, namely, the capacities, interests, opportunities and personality of employees.

1.5 Objectives of Personnel Management:

According to **Michael J. Jucius**, Personnel Management should aim at:

a) attaining economically and effectively the organisational goals.

b) Serving to the highest possible degree the individual goals, and

c) Preserving and advancing the general welfare of the community.

To put it in another way, Personnel Management has three pronged obligations. It must satisfy the employees by supplying them income, power, prestige, creative satisfaction or a combination of these. It must satisfy the owners by maximising their economic efficiency. And it must satisfy the community and society at large by supplying goods and services as efficiently as possible and by preserving and advancing goodwill, morale, loyalty and its reputation. This is not an easy task, for the three sets of goals are intertwined in such a way that the neglect of any one can destry or injure the others.

1.6 Growth of Personnel Management:

Nothing precisely can be said about the evolution of Personnel Management can be traced back to the end of last century. Before this, the development of this area was extremely slow. One can sub divide the evolution process of Personnel Management into following four periods:

a) Before 19th Century

b) First quarter of 20th Century.

c) Second quarter of 20th Century.

c) Current era (after 1950)

a) Before 19th Century:

It was **Robbert Owen** who can be regarded as the founder of Personnel Management. He wrote book " A New view of Society" where he has emphasised that there is a need for better labour relations, improvement in service conditions and cooperative labour movement. During this century, there has been enough emphasis on coordination and mutual welfare of labour management but there was no radical development due to lack of industrial development and growth.

b) First Quarter of 20th Century:

During this period, the emphasis was laid on Personnel Management because of the various problems arising due to the formation and development of labour unions. During this period, thoughts of **F.W. Taylor,** the Father of Scientific Management, were greatly appreciated. This quarter is responsible for introducing of new systems and also the large increase in the number of industries and their sizes. This, is turn, gave rise to complexity of work resulting in large aspirations of the work force because of the increase in production.

c) Second Quarter of 20th Century:

During this, revolutionary changes took place leading to a hierarchy system with definite norms in the organisation for the selection of the work force through different techniques like Psychological tests, interviews, group discussions etc. Norms were also designed for workers training and their welfare schemes. This period gave birth to the concept of human relations. It was in this period that **Elton Mayo** and his associates, initiated human relations in industry through various studies. After independence, a lot of effort has been made by the government and number of laws have been enacted in order to protect labour cause in the industry.

d) Current Era (After 1950):

After 1950, development of Personnel Management acquired a new profile of Professional Management, Personnel Management has now become an interdisciplinary knowledge, where industrial Psychology, behaviour Science, labour laws, labour legislation have been introduced. Personnel Management is now considered as science of Human Relations, Human Engineering, Organisational System and Design. The rapid growth of Personnel Management is because of the following reasons:

a) Fast changes in Technology

b) Industrial Revolution

c) Positive findings of Social Sciences

d) Complexity of Trade

e) Awakening in Labour

f) Government Attitude and Policies

g) Cultural and Social Changes.

h) Changes in the Social Value of Labour

i) Changes in managerial views

j) Changes in Organisational Setup.

An Industrial Revolution of 1950 has brought about specialisation and growth in the size of the organisations, awakening in labour, resulting in the formation of various labour organisations and federation. Cultural and Social changes are now very fast due to the changes in the educational background, changes in social values of labour and changes in the managerial view point etc. In addition to the above changes, there are fast changes in the form of business organisations, cooperation of science and industry and the control and coordination in industrial setups. Now the subject of Personnel Management has acquired considerable authority and is fruitfully, utilised for the welfare of personnel serving in the industry. This has acquired more dimensions, scope and significance in the wake of recent increase in industrial unrests.

1.7 Functions of Personnel Management:

Broadly speaking, experts have generally classified the functions into two major categories, viz - Managerial Functions and operative functions. Others have classified functions as general and specific functions, and yet others as "Personnel Administration Functions' and 'Industrial Relations Functions'. Functions have also been classified on the basis of the capacities; or on the basis of authority.

This type of classification of functions has been discussed in the following:

a) The General and Specified Functions:

Under "General" type of functions, the Personnel Management is required (i) to conduct personnel research, (ii) to assists in the programmes of personnel administration, (iii) to develop appraisal plans, (iv) to launch education and development programmes, (v) to develop a competen work force, and (vi) to establish and administer varied personnel services delegated to personr department.

Under specific functions the Personnel Management may involve itself in are employment, safety, wage and salary, benefit schemes, community relations and adv counselling the employees.

b) Personnel Administration & Industrial Relations Functions:

Personnel Administration functions relate to the functions of managing people from the lc to the upper level of the organisation and embraces policy determination as well as implementa of polices by the personnel the lower levels. Accordingly, "Personnel Administration" refer "creating, developing and utilising a work group' and involves all types of inter-personnel relationships between superiors and sub-ordinates".

The "Industrial Relation functions, on the other, are "not directly related to the funct of 'Managing people', but refer to interactions between the management and representatives of the Unions". Such functions involve all activities of employer - employee relationship, such as organisation of the union members: negotiation of contracts, collective bargaining grievance handling, disciplinary action, arbitration, etc, - the purpose of all these being to prevent conflict between the two participants.

The above two functions are inter-related and inter-dependent and hence, the most co mc terms used is "Personnel Management/Admir ation and Industrial Relations".

c) Functions classified on the basis of capacity:

This classification has been adopted by **Saltonstall**. According to him. "Although Personnel Managements" functions is the 'staff function', it also performs three roles, "Viz (i) He performs a line function not only because he directs the work in his own department but also in some service functions such as recruitment, administration of benefits, the plant canteen and allied activities (ii) He functions as a co-ordinar of personnel activities, in so far as he controls the functions of other departments (iii) He performs a typical staff function in the form of assisting and advising the line personnel to solve their problems.

d) Functions According to Degree of Authority:

Dale Henning and **French** made an interesting observation that "The personnel man is described in the text books and journals is like 'Abominable Snowman" much talked about but **Seldom** seen".

In this function the personnel look into the things carefully, viz. establishment of disciplinary procedure, inter-departmental data gathering etc.,

Every manager in an organisation has to perform the personnel functions in one form or the other in order to get thing done through others.

Again the personnel functions can be classified as:

I. Managerial and

II. Operative

I. Managerial Functions:

The managerial functions mainly concerned with planning, organising, directing and controlling of various activities of personnel department.

II. Operative Functions:

The operative functions are those functions which are entrusted to the personnel department such as general supervision, employment, development motivation, communication, compensation, integration and maintenance of personnel of organisation. Personnel management deals with the managing of these functions efficiently and economically.

1.8 Personnel Manager - Functions:

Personnel Manager is one of the many specialists, who has been appointed in the organisation as a result of the growth of the organisation. He is assigned the personnel functions like recruitment, selection wage and salary, administration, promotion etc. The Personnel Department gives assistance or provides services to all other departments on the personnel matters. Personnel Manager functions are line functions when he is directly responsible for wage, administration, time office, canteen, induction training and for day-to-day negotiations with the union. But in relation to all other executives his position is of an advisory and when he provides services to other department his functions are staff functions.

1.9 Future of Personnel Management in India:

One can expect several cultural, social and economic changes of great significance in personnel management to sweep through the country in the coming years. With greater emphasis on human dignity and with a stronger and more enlightened labour movement, the tenets of the

behavioural school with come popular and widespread. All this will create climate favourable for the growth and development of Personnel Management in India. As a consequence, the following changes are likely to occur in the field of Personnel Management which give a new content and form to the job of a personnel manager.

1. Greater involvement in development planning:

Our future personnel man will have to be more of a development man than a mere admistrator of personnel services. With this object he will have to get very much involved in basic organisational planning, keep pace with social, political and economic factors which can affect the internal situation of the company and advice management on the relationship between these factors and the achievement of organisational goals.

2. Change in Personnel Policies:

The ratio of educated to uneducated employed labour force has been growing in India in recent years. The aspirations and needs of educated people differ from those of uneducated people. Hence existing personnel policies and procedures, many of which were probably developed year ago when uneducated workers predominated, would no longer be adequate for a better educated work force which would demand greater autonomy and discretion in the workplace.

3. Change in Manpower:

Level of education of manpower will go up and it will become more mobile. On account of an easy access to better educational and employment opportunities, minority groups and scheduled castes and Tribes would become an important source of manpower in future with the resust that the manpower planning of every organisation will have to take account of the potential availability of talent and ability in these groups.

4. Increasing Government Rule:

In future, there will have to be greater coordination between the private and public welfare programmes. The private industry will have to support government efforts to improve public education, training and unemployment.

5. New Work Ethic:

The Personnel Manager would be called upon to mobilise new work ethic by helping line managers in the setting up and enforcement of good quality standards.

6. Greater Importance of Occupational Health and Society Programmes

7. Better Performance appraisal devices and new forms of compensation.

1.10 Summary:

Personnel Management is an important activity which is an integral part of the total management system. A great deal of time, money and efforts are invested by all managers in this function as part of their managerial responsibility and position. It is a responsibility of the personnel department to monitor the entire human resource programmes, policies and practices in the ultimate analysis to guide, train, develop, coach and assist line managers in managing their work force within the framework of organisational philosophy, policies and procedures.

The Personnel Management has come to occupy the pivotal place in the management of any organisation because of the changing attitude of people, government policies, labour legislation and changing concept of quality of work and quality of working life.

From the above, it is obvious that personnel management is a major component of the broad managerial function and has roots and branches extending throughout and beyond each organisation. It is a major sub-system of all organisations which are inter-related and inter-dependent. Every Personnel Manager's responsibilities include planning, for people, organising people; staffing with people, directing people; gaining the commitment, interest and effect of people; and applying controls to people.

1.11 Technical Terms:

1. Personnel	-	Staff-employed in a service or institution
2. Attitude	-	Position, behaviour
3. Centred	-	Mid point of anything pivot
4. Complexity	-	Involved.

1.12 Self-Assessment Questions:

1. Define Personnel Management and describe its objectives.
2. Personnel Management involves two categories of functions - Managerial and Operative". Describe these functions in detail.
3. Trace the evolution and growth of Personnel Management in India. Briefly describe the factors which have impeded the growth and progress of personnel function in India.
4. "Management of Personnel is a basic responsibility of every manager". Discuss.

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Lesson - 2

DYNAMICS OF PERSONALITY

2.0 Objective:

After completion of this lesson, you should be able to understand:

* meaning of Personality
* meaning of Individuality
* characteristics Human Behaviour
* personality Pattern
* stages in Growth of Personality
* personality and Organisational Behaviour

Structure:

2

2.1 Introduction:

The main problems of present day organisation is how to maximise the contribution of individuals. The conflict between the individual needs and the organisational objectives has been of major concern both to the managers and the behavioural scientists. So, the organisation should be concerned with the development of personal characteristics and operating effectiveness among its members. These characteristics include:

* Organisational Structure
* Managerial Principles and Practices
* Effective Motivation
* Effective communication
* Personnel growth
* Navigating the Organisational changes in and outside the organisation.

2.2 Individuality:

Each of us performs different roles in our life, at home, in schools, in colleges, in social gatherings and at the work places etc. People change caps from one mole to another but by doing so they do not become different individuals. Human behaviour in specific roles and the application of information about human behaviour is available in solving the human problems.

2.2.1 Characteristics of Human Behaviour:

* Intelligence
* Ability
* Creativity
* Flexibility
* Adaptability and
* Capacity to Change

These characteristics are available in every individual in some degree. What a man becomes is entirely the result of experiences, but other thinkers of behavioural sciences are of the other extreme views: An individual is conditioned by heredity. Individual behaviour is the product of environment. Individual potential can not be assessed without understanding the inner qualities of an individual. But it is very difficult to assess the inner qualities of an individual. Individuals who had not achieved any distinguished work for many years, may produce a work of genous one day. For example, a young Austrian boy who was simple as made no success in anything became a leading scientist. He is none other than **Albert Einsten**. Individuals act differently became they thing differently. The individual ability to learn is inherited. But, after his birth, a person will become a product of environment. Those inherited characteristics are modified by learning experiences.

2.3 Personality:

Personality is the overall development of a person. It is the unit that marks off any one member of the group as being different from other members in the same group. It is the sum total of all the tendencies that an individual has inherited and that he has acquired by expenses - Personality is the dynamic organisation within the individual of those psycho-physical systems that determine his characteristic, behaviour and thought.

2.4 Personality Pattern:

It is unique. Individuals are commonly described as belonging to certain types. One individual may be ambitious type and another may be conservative and another may be aggressive type. It increases as age advances. Thus, individuality is a product of heredity and environment. The natural process of sexual production guarantees novel genetic equipment for every moral human beings. The genes influence personality by affecting the quality of the nervous system, the bio-chemical balances of the body and structure of the body.

2.5 Formation of Personality:

Personality is formed by interaction of mother, father and siblings with child. The new born child is like a partially programmed computer. The child learns from the results of his own responses from others and from his social and cultural setting, he up-dates his computer's programme and cultural setting. The strength of reward affects learning and greater the reward higher the learning.

The childhood pattern persist in industry and it is important that we know about our social isolation. For example, an individual who was an eldest child as a foreman in the organisation treats his subordinates as he treats his younger brothers and sisters in childhood. He acquires the nature of dominance without his knowledge even in the factory which he acquired at home.

2.6 Stages in the growth of Personality:

Every individual passes through these stages but few individuals continue longer with some of these stages.

2.6.1 Stage of Dependence: Every individual starts his life completely dependent on others. A few individuals never weaned out from this dependence.

2.6.2 Stage of Comfort: In this stage, the main interest is bodily comfort. Even in grownups, the feeling of comfort as most important thing in life persist.

2.6.3 Stage of Impulsiveness: The parents praise a child when he makes his first steps but scolds him when he makes his walking in streets. The child is unable to make out the difference between these two activities and thus will be in a stage of impulsiveness. The individual did not understand the change from praise to punishment for walking. The child acts first and things later so do many adults who do not have outgrown childish impulsiveness.

2.6.4 Show of Stage: Show off stage is normal in childhood. But some adults do maintained this stage and feel proud in showing off.

2.6.5 Stage of Low-boiling point: Some individuals do not like being interrupted and they go through life with a low boiling point losing temper at little things.

2.6.6 Stage of Stubborness: Every child is too small and week to win by his own strength but

he could be stubborn and thus corner his parents. If his parents handle him wrongly at this stage, it may become a permanent habit feature in his future life.

2.6.7 Gang Stage: There are certain group of individuals who form the gang unless they can be the chief while others remain a alert and still want to be the chief. Some are still in the ganghood stage. An adult who does not go out of this stage, form a clique in the office with his friends.

2.6.8 Interest in Opposite Sex: During the college days, the gangs begin to break-up because many develop more interests in the opposite sex. Some individuals do not come out of this stage. They marry because, it was the thing to do, but keep their real companionship with a small gang of the same sex.

2.6.9 Mature Stage: Soon after the education, the stage for mature independence in gradually entered. Here, one plansahead for a career, looks forward to have his own family, provides for old age, and helps his community by co-operating with large groups. One becomes responsible citizen and individual.

2.7 Personality Traits:

A trait is a predisposition to respond in an equivalent manner to various kinds of stimuli. Traits are psychological entities that render many stimuli as well as many responses equvalent. Many stimuli may evoke the same response or many responses, have the same functional meaning in terms of the trait.

Several attempts have been made to isolate traits, but the efforts have been hindered because there are so many of them. In one of the studies only 17953 individual traits were identified. It is impossible to predict behaviour when such a large number of traits requires to be considered.

One researcher identified 171 surface traits but concluded that they were superficial. He has identified sixteen personality factors and he called them as primary traits. These sixteen traits have been found to generally steady and constant sources of behaviour, subject to the influence of particular situations.

2.8 Traits Influencing Organisational Behaviour :

Some of the important personality traits which influence Organisational Behaviour are:

* Authoritarianism
* Locus of Control
* Machiavellianism
* Introversion - Extroversion
* Achievement orientation
* Self - esteem
* Risk - taking and
* Self - monitoring

2.9 Personality and Organisational Behaviour :

It is an important determinant of employee behaviour. If an employee likes monotonou

11.9 MODEL QUESTIONS

1. Discuss the importance of linen and laundry services in a hospital?
2. Why housekeeping has assumed greater importance in corporate hospitals?
3. What are the factors do you keep in mind while designing a mortuary?

4. How do you equip an ambulance? What precautions do you take to serve accident cases while you use ambulance service?

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Lesson – 12

SANITATION AND WASTE MANAGEMENT

12.0 Objectives

After going through the lesson, you should be able to :
Describe the concept of Hospital Waste Management
Understand the various processes involved in Treatment and Disposal of Waste
Understand different methods of Treatment of Hospital waste
Highlight the danger Hospital Waste pose to the Community

STRUCTURE

12.1 INTRODUCTION

Last few decades have seen rapid growth of hospitals in India and the corporate sector in particular. Accordingly, there iss a quantum jump in the wastage generated by them. In the developed countries the concept of Hospital Waste management has not really spread in our country. It is time, we realise the importance of Hospital Waste Management(HWM) and the need to sensitize the top level managers about various types of waste, their generation, collection and transportation and final disposal. The onus should be on the generators of hospital waste, and proper segregation of waste at the source is the "sine qua non " of a successful waste management programme. It is this realisation, which led to the Ministry of Environment and Forest o prepare the Biomedical Handling and Management Rules, 1998.

We have to preserve the earth for the future generations and hand it over in the same condition in which we inherited the same from our predecessors.

12.2 IMPORTANCE OF HOSPITAL WASTE MANAGEMENT

A modern hospital consumes a lot of items for the proper delivery of medicare. All these consumables leave some amount of unusable leftovers which are called hospital waste.

The waste is generated as a result of patient care activities diagnosis, treatment, immunization research etc. The waste has potential to transmit various viral, bacterial or parasitic diseases to the staff, patients and general public at large.

The health of the hospital staff is directly dependent on a clean and hygienic environment. Health hazards directly associated to poor hospital waste management are:

Injuries from sharp objects to all categories of hospital personnel.

Nosocomial infections to patients from poor infection control and poor waste management.
Risk of infections to outsider public around hospital and particularly to waste handlers, scavengers and the visitors.
Increased incidence of hospital born diseases to the patients.

Therefore, it is important to have a scientific approach towards managing hospital waste.

12.3 PROBLEMS OF HOSPITAL WASTE

Problems of hospital waste are many. Since various groups of public interacts with the hospital on a day to day basis, the problems that arise on account of this has to be thoroughly examined first.

IMPACT ON HOSPITAL EMPLOYEES

Hospital staff are involved in generating, collecting, storing and treating the waste. All the personnel are exposed to and are totally at risk of getting infections which could be transmitted through air, blood, faces, oral routes etc.

In day to day activities, all personnel are used to working with needles, blades, glass which are usually sharp objects and an injury is common . This is the most common route of entry of any kind of infection. Air borne infections find their entry through the nose. Dreaded infections like AIDS, Hepatitis and TB have the potential to transmit to staff treating them. The Hospital authority should provide adequate number of gloves, footwear, protective eye, headgear, masks and gowns. Staff working in high risk areas must be immunised against tetanus, hepatitis etc.

IMPACT ON PUBLIC

Interacting public around hospitals are attendants, patient's visitors, vendors, suppliers. Hospital waste do have some impact on the health of the masses. Public awareness has been increasing on the issue do to the coverage of media and NGOs. Hence , the problem must be tackled on an urgent basis.

IMPACT ON ENVIRONMENT

Air inside a hospital could be contaminated and contain viruses and bacteria
From patients of Tuberculosis, Chicken Pox, Rabies etc., which could pose a greater threat to community. Many times, excreta, body fluids from laboratories
Autopsy room or mortuary could give rise to a foul smell around the premises. Liquid and other chemical wastages flowing out of hospital is another potential hazard. Radioactive wastes are another serious threat to the environment. Treatment incinerators could emit poisonous gases that cause serious problem to the ecology.

HOSPITAL BORN INFECTIONS

We need to discuss in detail about the hospital acquired infection and the impact of hospital waste on the same. Various modes of transmission are:

Aerial route
Oral route
Contact Route

Parental route
Equipment and material route
Sources of infection
Patients own Flora
Flora of another patient
Environmental sources
Contamination by patients, attendants and hospital staff
Micro organisms responsible :
Enterococci
Non hemolytic streptococci
Anaerobic coccs
Claustridium tetani
Flavo Bacterium
Klebsilla
HIV
HBV

Therefore , the role of hospital waste in hospital acquired infection is of greater importance. Following measures are suggested due to medical waste:

Select safe or less hazardous substitute for chemical agents
Use closed storage for volatile agents
Use proper ventilation and exhaust fans
Use proper protective clothing with arrangements of disihfecting and disposal
Popularize use of colour and emblem code on container bags
Introduce monitoring and surveillance for problem areas on high risk situation
Proper disinfecting and sterilization practices to be followed
Universal precaution measures to be followed
Hospital infection control committee to be formed.

CHECK YOUR PROGRESS 1

List different types of problems on account of Hospital waste?

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12.4 LEGAL ASPECTS OF WASTE MANAGEMENT

Ministry of Environment and Forests, Govt. of India issued Bio-medical Waste(Management and Handling) Rules 1998 in our country. Violation to these rules is punishable upto 5 years rigorous imprisonment or a fine of rs.5000. Highlights of the rules are as under.

Every Hospital generating medical waste shall install an incinerator or shall set up a common facility.

Shall notify about the facility and operation of the same in official Gazette

Shall segregate all categories of wastes prior to its storage, transportation, treatment and disposal

All such wastes must be destroyed by incineration or any other treatment and duly get approved to that effect by the appropriate authority

Wastes that are not incenerable shall be pretreated, disinfected and shall be disposed off in an environmentally safe manner by the authorised person in such sites identified by the appropriate authority for this purpose as per the rules.

No person shall dump, discharge or dispose or cause to be dumped, buried, discharged or disposed any such waste in any place other than a site identified for the purpose by the appropriate authority.

Proper safety measures must be taken in the process of waste disposal

Treatment and disposal facilities must be located away from the Hospitals, nursing homes, veterinary institutions, residential localities and other organisations

All plastics shall be disinfected and recycled properly.

The medical waste shall not be disposed off in the municipal dustbins, open places.

No person shall recycle or reuse any such waste except glass ware, Provided such glass ware is disinfected and reused for in house purpose only .

Rules must be strictly followed while disposing medical waste

All records in connection with the waste disposal shall be subject to inspection and verification by the appropriate authority from time to time.

CHECK YOUR PROGRESS 2

Visit the Waste Disposal department of a corporate hospital and observe whether the rules set by the ministry are being followed?

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12.5 WASTE DISPOSAL

For safe and effective disposal of medical waste, following steps are followed:

SEGREGATION
DISINFECTION
STORAGE
TRANSPORT

5)

FINAL DISPOSAL

Segregation: There is a general tendency to throw all the garbage and waste in the same container. This results in mixing up of infected waste, non infected domestic waste, sharps etc. If this mix up is not avoided, entire mixture has to be considered as infected waste. The cost of treatment and disposal of this waste goes up due to larger bulk. Advantages of segregation are ;

General waste does not become infectious
Segregation reduces chances of infection to staff
Treatment cost comes down
Non infected waste can be recycled

Segregation can be done at wards, operation theatres, ICUs, stores, pharmacy, laboratories, autopsy room etc.

For easy identification of different types of waste, specific color code is followed. They are given below.
Yellow: Yellow plastic bags are used for segregating Human anatomical waste, dissected parts, tissue removed at surgery, aborted foetus, laboratory cultures, laboratory specimen, items contaminated with blood or body fluids like dressing material cotto, bandages etc., animal tissue used in experimental laboratory

Method of disposal: incineration, deep burial

Red : Red plastic bag or disinfected container is used for segregating laboratory waste, culture plates, items contaminated with blood, non sharp disposable items like gloves catheters, tubing, intravenous sets etc.

Method of disposal: Catheters, tubing etc., are shredded to prevent reuse. After shredding they are disinfected by auto clavig, microwaving or using chemicals. Finally they are sent for incineration.

Blue or white translucent plastic bag : Puncture proof container like empty cans or thick card boardboxes, translucent plastic bags of blue or white colour are used to store sharp items like needles, syringes, scalpel blades, broken glass items etc.

Method of disposal: After shredding these items either autoclaving, microwaving or chemical treatment is carried out. The waste then is sent for deep burial or incineration.

Black : Black plastic bags are used to segregate discarded medicines, cytotoxic drugs, chemicals which have been used for disinfecting, insecticides, incineration ash.

Method of disposal : \disposal in secured landfill.

Liquid : This waste is disinfected and discarded in drains.

Radioactive waste : This waste is hazardous. It is stored in lead containers in the basement of hospital building for 3 to 6 weeks for the radio activity to disappear. After this period it is discharged in drains.

Disinfection: In order to render infectious items free from pathogenic organism, disinfecting is carried out before transporting and disposing them. Different methods of disinfecting like thermal, chemical , radiation and microwave are in use.

Storage: Until adequate quantity accumulates, waste needs to be stored at the site where it is generated. It is necessary to use colored bags and also label them. Waste bags or containers are carried to specific local storage place. It is necessary to have security at this place to prevent unauthorized persons and rag pickers handling waste material. If the hospital has its own disposal site, the waste can be sent there by proper garbage trolleys.

Transport of waste : From different areas, segregated waste bags are sent to the dumping place of the hospital. Trolleys/ carts used for transporting garbage should not be used for any other purpose. Persons carrying garbage should wear disposable plastic gloves. Spillage must be avoided.

From the hospital dumping place wastage should be taken to appropriate place for incineration, landfill, vermiculture etc. It should not be mixed with general garbage. Vehicles carrying hospital waste should not carry general municipal garbage.

Final disposal: Final disposal of wastage depends on its category. Noninfectious waste like papers can be recycled. Bio degradable waste can be used for landfill, vermiculture or just be buried. Infectious solid waste is incinerated. Infectious liquid waste is disinfected and flushed out or discharged in the drains.

12.6 MANAGEMENT ISSUES

Wastage disposal system can be operated by well trained staff. Following measures are useful.

Attitude Change: Management of hospital waste requires diligence and care from a chain of people starting with nurse, doctor, labour staff, persons transporting waste, persons handling mechanical and technical aspect. If need for safe disposal is emphasized, cooperation for segregation, storage, disinfecting etc., will not be difficult.
Training and Motivation: People who handle garbage are often not aware of the risk and hazard of the activity. They are not aware of the importance of their contribution. Therefore, training of the staff is highly important.

Responsibility: It is desirable to specify job responsibility. If there are failures or problems, proper communication will sort out the same and decide on better alternatives.

Occupational Health : Health hazards due to improper handling of hospital waste must be known to all employees. The problems are not faced merely by the society but more by the staff.

Standardisation and Pricing: Steps required for safe disposal of hospital waste require some expenditure. If proper system is evolved and implemented, the cost of safe disposal works out to be 0.1% to 0..2% of the total running cost f the hospital. Saving on this activity is of little significance in proportion to total expenditure.

Surveillance: Continuous observation of the process is absolutely necessary. Hospital Infection control committee should actively carry out surveillance. They should monitor all accidents, injuries and infections separately. Staff handling waste should have regular medical checkup.

CHECK YOUR PROGRESS 3

Visit a nearby hospital and observe the waste disposal process in practice?

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12.7 SUMMARY

Hospital waste management is a social issue than a medical issue and hence every hospital must evolve systems for waste disposal. This has to be viewed as a social responsibility as well as a legal requirement. All hospitals like clinics, labs, nursing homes etc., have to follow the rules and devise their own way of waste management. Different types of medical waste requires different techniques of disposal. Failure on the part of hospitals increase the incidence of infections to the staff as well as the public. Medical waste should be classified and separated before it is destroyed and disposed to reduce the health hazard character of the same. Proper management is necessary to ensure effective disposal of medical waste.

12.8 KEY WORDS

HOSPITAL WASTE : All consumption items and leftovers in the process of health care process such as linen, blood and tissue, package of medicines, garbage etc., that could potentially damage the health of humans connected with the hospital directly or indirectly.

HOSPITAL BORN INFECTIONS : Infections that cause to humans in the premises of hospital due to unhygienic conditions ex: Hepatitis, TB .

INCENERATOR : Machine that totally destroys medical waste that is exclusively used for the same.

DISINFECTION : Process of removing the microorganisms present in the medical waste before it is being disposed off.

SURVEILLANCE : Being vigilant about the process of collecting, classifying, disinfecting and disposing of medical waste.

12.9 MODEL QUESTIONS

1. List out different types of waste generated in hospitals?
2. What are the health hazards associated to improper disposal of medial waste?
3. What are the measures to be taken for handling hospital waste?

4. Discuss the steps involved in effective disposal of hospital waste?

5. " Once you go to a hospital, you need to go there always". Examine the statement in the context of hospital born diseases.

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UNIT - IV

Lesson - 13

HOSPITAL ACQUIRED INFECTIONS

Objectives

After studying this lesson, you should be able to:
Describe the impact of Hospital Acquired Infection (HAI)
Understand the Epidemiology of HAI
Find the routes of the spread of HAI
Discuss the methods of controlling HAI
Understand the composition of Hospital Infection Control Committee
Describe the methods of Surveillance

STRUCTURE

13.1 INTRODUCTION

Hospital infection occurs in every hospital but over looked normally. It becomes big issue when damage is of high proportion in relation to the disease for which he has been hospitalized.

Hospital infection is the single most important factor that adversely affect the performance and image of a hospital. It prolongs the hospital stay of patients, increase bed occupancy rate and troubles patients, community and the society in general.

The magnitude of the problem is difficult to assess due to the lack of credible research and information. However, the overall post operative infection rate in India is estimated to be around 10 to 25 %.

Hospital acquired infections remains a problem world over. IN a recent survey conducted by WHO on 28,861 patients in 47 hospitals of 14 countries located in 4 continents, the prevalence rate of HAI of different hospitals varied from 3 to 21 per cent with an average of 8. 4 per cent. It is possible to reduce the incidence of infection.

Hospital infection can be hospital associated or hospital acquired. Hospital associated infections are those, that are acquired during hospitalization as well as those that are present upon admission, having been acquired prior to hospitalization.

The present topic is restricted in scope to "hospital acquired infection" which is also known as "Nosocomial infection" and cn be defined as, "Infection acquired by the person in the hospital, manifestation of which may occur during hospitalization or after discharge from hospital". The person may be a patient, members of the hospital staff or visitors.

The problem of hospital infection has received the attention of government of India and two high powered committees , one in 1968 headed by Dr. K.N.Rao, the then Director General of Health Services and other in 1976 headed by Dr. Sarat Kumar ,Deputy Director General of Health Services, investigated in detail the problem of hospital infection in Delhi hospitals. DR. Rao committee suggested a multipronged attack for control of hospital acquired infections occurring not infrequently and emphasised that, " The reservoirs of infections in the hospitals must be attacked, carriers must be dealt with, and rigorous asepsis in the wards and theatres introduced. Clean air clean bedding and hygienic methods of dust removal must be recognized as basic requirements, and the use of hospitals must be controlled and dictated by essential needs." Sharad Kumar committee in 1976 recommended formation of Hospital Infection Control Committee, maintenance of proper medical records, and medical audit, training of staff, control of over crowding, improvement of sanitation, kitchen and laundry services.

It is necessary to introduce the following activities in each hospital with bed strength of more than 250.

Management of HAI control activities
Surveillance of HAI
Operational manuals for different high risk procedures
Sterilisation and disinfection procedures
Discarding and disposal procedures
Manpower development in service training
Publication of information

13.2 EPIDEMIOLOGY

Like any other disease process, hospital acquired infection has also got " epidemiological triad" i.e., the agent, host and environment. Soundness of surveillance and control program depends on sound epidemiological knowledge.

The Agent
The agent includes entire spectrum of microbes e.g., staphylococci, gram-vebacilli, occasional streptococci, viral, rickettsial, fungal and protozoal infections. It is said that:

Large number of all hospital infections are due to gram-ve organisms

Some of infections are contributed by staphylococci

Proteus, e.coli, salmonella, shingella, klebsiella, ps. Aeruginosa are increasing in their involvement as causative agent of hospital acquired infection.

Carrier stage of organism and their colonization and increased resistance of antimicrobial agents are important factors of consideration..

The Host
Decreased resistance of patients due to under mentioned factor contribute to a great length on susceptibilities to hospital acquired infections. The factors are:

Extremes of ages
Primary ailments with concomitant disease like diabetes mellitus, chronic nephritis and malignancies.

The therapeutic practices e.g., whole body irradiation, use of cytotoxic and immunosuppressive drugs, indiscriminate use of antibiotics and steroids etc.

Complicated diagnostic procedures e.g. venepuncture, types of aspirations, cardiac catheterisation and length of operative procedures.

Endogenous infections.
The Environment

Everything around a patient in the hospital is his environment. These infection can be acquired from:

Other patients, hospital staff and visitors, food, water, dust and other contaminated inanimate articles.

Drug resistant microorganisms and change from non pathogenic strain to pathogenic are found commonly

Hospital acquired infections can be derived from:
The patient's own flora: Self Infection: The micro organism concerned is not pathogenic under normal conditions, but underlying disease, invasive diagnostic and therapeutic procedures including immunosuppressive even antibiotic therapy and the like, may enable it to reproduce, spread and implant itself at a site where it may produce an infection.

The flora of another patient: Cross infection: In such cases, the micro- organism concerned is transmitted ;

By direct contact between patients

By air
By the staff who collect the micro-organisms directly on their hands or cloths and transmit them to another patient

Environmental Sources: Hospital air harbors more bacteria which are more often pathogenic and milti drug resistant. Hospital surfaces are contaminated by patient's secretions, excretions, blood and body fluids, animals and insects. Contaminated by the patients, staff, visitors, blood or infected water, animals and insects.

There fore, human occupies a central position in spreading infections as a reservoir and source of micro-organisms,as a disseminator and a recipient or target.

13.3 ROUTES OF SPREAD

The organisms are transmitted by the following routes:

Direct route: Person to person carrier, hospital staff and visitors, air borne route which includes patient.
Indirect route: Through contaminated inanimate articles like food and drink, dust, bed linen and equipment.
Important considerations in the mode of transmission of hospital acquired infections for instituting effective control measure are:

Greater exposure of patients to infectious agents in hospital environment.
Inadequate ventilation, faulty design of wards and departments.
Non availability of isolation rooms, dirty and clean utility room and janitor's closets in many wards.
Over crowding in hospital wards.
Spread of infection from undiagnosed infectious patients at the time of admission.
Intimate contact between patients and staff and visitors.
Inadequate and substandard ascetic procedures, including carelessness in hand washing.
Poor kitchen service, laundry facilities and inadequate sterilization standards.

Faulty house keeping.

CHECK YOUR PROGRESS 1

Identify different sources of Hospital Acquired Infections ?

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13.4 CONTROL AND PREVENTION

Hospital acquired infections can be prevented and kept under control by following the measures discussed as below:

HOUSE KEEPING

*Effective sanitation and personal hygiene should be kept at a high level.

*Efficient house keeping and clean supply of linen and dress.

* Periodic washing of hospital wards and floor.

Separate rooms and isolation facilities should be provided for infectious Patients

*DIETARY SERVICES

Ordering, procurement, preparation and distribution of diet must be arranged through organized kitchen service. Adequate quality water must be provided for washing and cleaning of utensils.

Mechanical cooking range must be installed with least handling of humans. Periodic examination of cooks and food handlers must be done.

LINEN AND LAUNDRY

Linen and laundry has to be cleaned and disinfected as per the standards set for the same. The containers and the bags used for transporting linen should be checked properly. Drying of the linen should take place indoors only.

CENTRAL STERILE SUPPLY DEPARTMENT(CSSD)

Sterilization of all hospital supplies reduce hospital acquired infections. In smaller hospitals optimum sterilization of equipment should be ensured through autoclave and steam steriliser. Frequent check to ensure standard should be carried out.

SECURITY

Large number of visitors are found visiting patients in the hospital and sometimes in prohibited areas like ICU postoperative areas etc. They may bring with them different body flora and leaving some of them in and around the patient which further may cause hospital acquired infection. Hence, restricting visitors with efficient communication and security will decrease hospital acquired infections.

ENGINEERING AND DESIGN

Hospital designs and quality construction goes a long way in reducing hospital acquired infection by providing better ventilation and light. Positive pressure filtered air in hospital acquired infection areas reduces hospital acquired infections considerably and should be introduced in areas like OT complex, ICU, Nurseries, Labour rooms etc. Good maintenance of building and round the clock water supply decreases the chance of infections.

NURSING CARE

Special nursing care also reduces hospital acquired infections. This is very important for the patients suffering with chronic diseases and constantly using chemotherapy and immunosuppressive drugs. Further, nursing staff must ensure strict personal hygiene and hand washing, use of mask, due care for preparation of feeds, sterilization of bottles and other accessories .

WASTE DISPOSAL

We have little awareness about the discarding and disposal of hospital waste in our country. In many hospitals, the waste is dumped at a garbage collection centre from where this total waste is taken away by the municipal corporation's garbage collection vans. Before it is collected by the van, rag pickers sort out this waste and take out anything of some value without knowing the harmful effects of the material. Hence, the waste disposal process must be carried out in a scrupulous and systematic manner.

ANTIBIOTIC POLICY

Each hospital must have an antibiotic use policy so that indiscriminate use of antibiotics can be checked as indiscriminate use of antibiotics is known to cause drug resistant bacteria. Hospital acquired infection due to this drug resistant bacteria are very difficult to treat and are major cause of septicemia.

13.5 HOSPITAL INFECTION CONTROL COMMITTEE

A committee shall be constituted to take the overall responsibility to minimize and prevent hospital infections. The committee consists of the following members.

Hospital Managing Director - Chairman
Microbiologist - Secretary
Three Members (medicine, Surgery, Gynecology, pediatrics etc.)
Two Members (from super speciality departments)
Member - Nursing
Member - Maintenance staff

Committee shall meet at regular intervals and manage the following :

Cleanliness
Use of antiseptics and disinfectants
Preparing and implementing safe procedure for hospital waste disposal.
Periodical testing for microbiological flora of various sites
Deciding antibiotic policy
Trace the source of infection on receipt of report of infection
Recommend measures to be taken to prevent future recurrence and also for high risk areas.
Training and orientation of staff of all the categories.
Continuous monitoring and audit of incidence of infection
Prepare guidelines for immunization of staff members working in high risk areas
Prepare detailed guidelines for universal precautions to be observed by the staff to prevent infection
Issue regular circulars mentioning and reminding desired practices.

CHECK YOUR PROGRESS 2

Visit a corporate hospital and study the functioning of Hospital Infection Control Committee?

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13.6 SURVEILLANCE

The aim of the surveillance is to detect and methodically record all hospital acquired infections. Hence surveillance is important in hospitals for infection control. Continuous surveillance allows the early detection of out breaks. It is necessary to find out incidence and trends of HAI, causative organisms and their antimicrobial sensitivity, according to site of infection, speciality and ward/ floor. This information can also be used for evaluating control measures and policies introduced from time to time.

Predominantly, four types of hospital acquired infections can be recorded on the basis of clinical data. They are;

Urinary Tract Infections

The urinary infections may be symptomatic or asymptomatic. Their recording depends partly on the microbiological tests performed.

Infections of the Lower respiratory Tract

The clinical signs of infection(cough, pain, fever) are enough for these infections to be recorded, even if no chest X ray or bacteriological tests have been performed.

Post-operative Infections
Any surgical wound which results in a particular discharge must be regarded as a hospital acquired infection.

Systemic Infections
A positive blood culture revealing a known pathogen, or at least two blood cultures revealing a micro- organism reputed to be non-pathogenic or opportunistic, must be taken into account and listed as hospital infection.

The information collected in this manner is processed by the infection control sister. A weekly, monthly and yearly report, makes it possible to compile statistics on infections by speciality or floor and for the hospital as a whole, for each type of infection. Hospital Infection control Committee will make use of the information for effective control.

13.7 TRAINING AND EDUCATION

It is important that knowledge, skills and behavior of all categories of hospital staff is tuned to control and prevention of hospital acquired infection. This can be achieved by holding lectures and practical Sessions involving them. A part from that, training of a few groups of functionaries especially section heads like Sister Incharge, OT Complex, ICUs, Labour Rooms, Post Operative Wards, Sanitary Inspectors, Incharge CSSD, Securlty, Dietetics will go a long way in reducing Hospital Acquired Infection in the hospital.

13.8 UNIVERSAL PRECAUTIONS FOR HEALTH CARE WORKERS

Healthcare workers must take the following precautions on a continuous basis:
Gloves must be used when direct contact take place with patients.
Masks and protective eyewear or face shields should be worn in
OT. Gowns and aprons should be worn during procedures that generate blood and body fluids.
Hands should be washed immediately after gloves are removed
Be aware of the injuries caused by needles, scalpels and sharp instruments.
Resuscitation bags or other ventilation devices should be used when mouth to mouth contact with the patient is necessary.

Pregnant health care workers should be away from HIV patients to minimize the risk of infections.

13.9 LEGAL ASPECTS

Hospital acquired infections will increase average length of stay of patients. This may cause greater productivity loss to the nation besides increased treatment costs. Patients and their relatives suffer and some cases mortality may occur. In such cases any patient may approach Consumer Protection Forums for Compensation under Consumer Protection Act. There fore it is in the best interest of the hospital the infections should be eradicated.

13.10 SUMMARY

Hospital Acquired Infections are known to take place leading to large amount of morbidity and mortality. It also increases the length of stay of patients in hospitals. Effective control of hospital infections may reduce the recovery time by 20 % which is beneficial to the patients as well as to hospitals. There fore continuous surveillance has to be maintained and information regarding infections has to be collected processed and Infection control committee has to function effectively on the basis of the lead given to them.

Training in this area is very much essential and need to be organized on an emergency basis.

13.11 KEY WORDS

HOSPITAL ACQUIRED INFECTION : Infection that occurs on account of a hospital visit to a patient, staff or visitor.

EPIDEMIOLOGY : Process explaining how a disease spreads between the source, carrier and the affected in an environment.

SURVEILLANCE : Constant study, monitoring and informing about the nature , type and magnitude of infection in hospital.

13.12 MODEL QUESTIONS

1 Explain different sources of Hospital Acquired Infection(HAI) ?

2. What measures do you take while preventing HAI?

3. What is the importance of surveillance and training to control HAI?

4. Discuss the role of staff in prevention and control of HAI in Indian Co context?

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Lesson - 14

DISASTER MANAGEMENT

Objectives

After going through this unit, you should be able to:
Understand the concepts of disaster and it's management
Disaster Planning and the preparation of disaster plan
Describe the composition ,functions and responsibilities of disaster committee
Out line the role and responsibilities of medical nursing staff and Departments
Understand the disaster facilities required, and decide upon a manual or disaster response

Structure

14.1 INTRODUCTION

Disasters existed in the history of mankind and no community is ever found a way out to avoid them. Disaster events result in number of deaths, injuries, destruction of property, economic losses etc., and community requires immediate assistance to overcome them.

A study of United Nations Environment program (UNEP) found that India is one of the most disaster prone areas in the world. Globally the death toll in natural disasters is increasing. Cost to the global economy is estimated to be around 50,000 million US $ a year. Death toll may be around 250,000 per year the world over. Hence it is important to understand the implications of disasters and the remedial measures to be taken by institutions and individuals in this regard.

14.2 CONCEPT

The most important aspect of disaster management is to understand it. Each disaster is different and has it's own characteristics and problems. Clear understanding of the basic concepts is necessary for planning and proper response.

The basic concept of disaster has changed over the time. Disasters have been defined in several ways on the basis of degree of physical impact of the event, magnitude, disruptions of public safety, efforts required to control the event.

The WHO defined disaster as any occurrence that causes damage, ecological disruptions, loss of human life and deterioration of health and health services on a scale sufficient to warrant an

extraordinary response from outside the affected community. Pan American Health Organization(PAHO) defined disaster as an overwhelming ecological disruption which exceeds the capacity of a community to adjust and consequently requires assistance from outside.

Disasters have been classified into two types:
Natural and manmade disasters.
Natural Disasters
Meteriological Disasters : Storms, Cold spells, Heat waves, and draughts
Telluric and Teutonic Disasters: Earth Quakes, Tsunamis and Volcanic Eruptions
Typological Disasters: Avalanches, landslides and floods
Biological Disasters : Insect Swarms, Epidemics , communicable Diseases

Manmade Disasters
* Civil Disturbances: Riots and Demonstrations
* Warfare : Conventional warfare

Non conventional warfare: Nuclear, Biological and chemical warfare, Guerrilla warfare including terrorism

Refugees : Forced movement of large number of people usually across Frontiers

Accidents : Transportation calamities, collapse of building, dams and the structures, mine disasters
Technological Failures : Mishap at a Nuclear power station, Gas leakage in chemical Industries

However, the division between natural and manmade disasters is to some extent inaccurate as one may follow the other. Some of the worst calamities of our time have caused due to the cumulative effect of several of the above.

Disaster process

Every disaster situation has been conceptualized as a process with differing phases. In each phase, the information property and to dealing with the immediate damage caused by the disaster. It's success depends vitally on good preparedness.

Disaster Recovery : Recovery is the process by which communities and the nations are assisted in returning to their proper level of functioning following a disaster.

Disaster Behavior : Analysis of disaster situations over a period of time revealed a general behavior of individuals and organizations in such situations. Each must be understood in order to cope with the situation.

The Victim: Most people believe that they are not going to be affected by the disaster. As a result they are likely to ignore or minimize warning and refrain from taking preventive measures. Prompt setting up of communications will minimize the harm from this sort off psychological pattern.

Disaster Syndrome: A form of stress or shock reaction called a disaster syndrome is observed in the aftermath of relatively sudden and extensive disasters. It occurs for a short while with a few people.

Convergence : A common problem in most disaster events and it has an impact bearing on disaster management characterized by the movement of large number of people. The convergence is motivated by a concern for victims, a desire to help, simple curiosity and the search for information. The convergence is described to be of three types:

Personal convergence: The physical movement of people.

Material convergence: The physical movement of supplies and equipment.

Information convergence: The quest for information through the transmission of messages by word of mouth, telephones wireless etc.

Leadership : In order to bring order and efficacy of administration of relief, sound leadership is necessary. It can save lives and prevent deaths. Disaster management involves many agencies with many functions at various stages. Integration and optimization of resources using multiple channels requires effective leadership. Leadership issues commonly found in disaster situations are:

Leadership must be shared
Organization of leadership must be well defined
Higher levels of leadership must be held by some one enjoying legal authority.
Leadership must understand principles of organization and delegation.
Leadership should be open minded.

CHECK YOUR PROGRESS 1

Track down some of the disasters happened in Andhra Pradesh?

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14.3 DISASTER MANAGEMENT IN INDIA

India is a vast country with an area of 32,37,782 square kilometers. India with 2.4 % of world land mass, is the 7th largest country in the world. Our country is the second most populous country in the world with 15 % of the world population staying . India manifests many natural disasters like floods, earthquakes, cyclones and droughts along with manmade disasters like MIC disaster in Bhopal, collapse of buildings, train and Aircraft accidents etc. Our vulnerability to disasters can be seen from the following:

Floods: India is the most flood prone countries in the world. On an average 9 million hectares of land is affected by floods every year.

Earth quake: The country has about 56 % of a total area of 3.3 million sq kms vulnerable to seismic activities of varying intensity. The earth quake prone areas have witnessed over 33 major earthquakes within the country. During the past 80 years, India has lost about 70,000 lives due to earth quakes.

Cyclones: India has a long coast line of 5,700 kms which is vulnerable to tropical cyclones arising in the bay of Bengal. Cyclones are causing greater damage t life and property in the coastal areas of India.

Manmade Disasters: India suffered the largest manmade disaster in Bhopal tragedy where thousands of lives were lost apart from permanent disability to lakh of people.

In our country, a national disaster policy is in the making and the present policy of the government is to provide quick relief to the affected upon any disaster of high magnitude. In the central govt. the Home minister is in charge and at the state level Chief Secretary is in charge . While providing relief and rehabilitation, each District is taken as a unit.

14.4 DISASTER PLANNING

Disaster management requires a planned and systematic approach towards understanding and solving problems of people in the wake of disasters. The effect of disasters could be minimized , if there is pre disaster preparedness and a disaster plan. Some general principles of Disaster planning are as under:

It should be a continuous process.
It should reduce the unknown in a problematic situation by foreseeing what is likely to happen.
Plan must evoke appropriate response.
Plan must be based on appropriate knowledge.
Plan must focus on general principles.
Plan should serve as an educational activity.
Plan must be tested.

Adjust the plan according to the behavior of people who have to follow the plan rather than expecting them to learn behaviors and rules instead of working.

Greater the preparedness, greater the operational success.

Though disasters vary in nature, the problems posed by them may be similar or general.
Plan must be realistic and adaptable.
Plan must be using the existing structure rather than creating a new one.
Plans must be clearly written.

Each disaster requires disaster medical experts. Disaster medicine is a mass and multiple trauma medicine and it is not different from normal medicine. Some types of disasters result in a large number of casualties, which are beyond the routine handling capacity of health care system. Some of the principles are:

Doing the best for the most within the available resources.

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Graded care of casualties, first aid and lifesaving measures, preparation for evacuation, primary surgery and definitive treatment.
First aid measures carried out at the earliest assumes life saving significance.
Simple and standard therapeutic principles.
The casualty must be conditioned or treated so that the degree of urgency is lessened.

CHECK YOUR PROGRESS 2

Discuss the principles of Disaster planning?

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14.5 HOSPITAL DISASTER PLAN

Hospitals play a vital role in the medical care of the community during disaster situation. Disasters pose lots of challenges to the health care system and only those hospitals that are prepared can meet the demand of such situations.

Objective and Purpose
The purpose of a disaster plan is to make it possible to attend, promptly and effectively , to the largest possible number people requiring medical care, in order to reduce the number of deaths and disabilities. The principle objectives are:

To prepare the staff and institutional resources for optimal performance in an emergency situation of certain magnitude.

To make the community aware of the importance of the disaster plan, how it is executed and the benefits it provides.

To train the staff as a part of educational activity.
To carryout periodic drills and it's evaluation to update plans.

Development of Plan
A prerequisite to disaster management is that emergency systems must be functioning well on a routine basis. The response capability of the hospital will vary from hospital to hospital based on it's size, type of hospital, location of the hospital resources available and role allotted to the hospital in over all community plan. Development of disaster plan should take into account the planning process:

Analyse the risk and hazards in the geographic location concerned with the hospital.
Carryout vulnerability analysis of the community exposed to the risk and Hazards.
The probable demand and nature of work expected during disasters.
assess there sources available.
Determine response capabilities
Determine the aim of disaster plan
Determine organization structure for disaster

Development of organization, allocation of role and responsibilities. Authority structure should be made clear.

Training of organization
Testing of the organization
Testing of the plan
Periodic revision of plan and organization

Hospital disaster plan should include the following:
Efficient system of alert and staff assignment
Conversion of a usable space into clearly defined areas , patient observation and immediate care

Removal of casualties to more appropriate and definitive medical care facilities.
Special medical services for disaster cases
Procedure for prompt transfer of patients within the hospital

Security arrangements
Establishment of a public information centre
Evaluation of hospital services and it's sources of electricity ,gas, water, food, and medical supplies.
Method of identifying patients who are immediately dis chargeable or transferable
Special disaster medical record and medical tag
Planning use of OT, X-ray, Blood bank and laboratory.

14.6 DISASTER COMMITTEE

The hospital disaster management committee operates as a decision making level and the action decided upon has to be executed by the medical staff supported by the institution's logistical and general service units. The committee should include doctors and nurses as well as administrative staff. The membership of the committee include the following:

The Managing Director
In charge of accidents and emergency services
Department heads
Nursing superintendent
Hospital administrator
A staff representative
Functions of the Hospital disaster committee are:
To develop the hospital disaster plan
To develop departmental plans in support of the hospital plan
To allocate duties to the hospital staff
To establish standards of emergency care
To conduct and supervise training programs
To supervise the drills to test hospital plan
To change and revise disaster plan as and when a disaster occurs of a different kind.

14.7 DISASTER RESPONSE

Disaster response is heavily dependent on the disaster plan, preparedness, training and periodic rehearsals. The response must be in chronological order to facilitate execution. Designated hospital staff should be responsible to activate the disaster plan. The casualty medical officer, hospital administrator on duty or senior consultant on call can be designated for putting plan into action. Plan often fails because all or none respond. Phased response has been suggested to overcome this problem. The graded response system in practice is as under:

Green Alert: In case of sudden influx of causalities, it mobilizes staff on duty to take care of them without disturbing normal activity.

Amber Alert : Prepares the hospital to admit a large number of causalities. It is an extension of green alert, which must be completed first. Receiving wards are cleared, staffed and prepared together with ICU and OT.

Red Alert : It prepares hospital for a major community disaster. An extension of the green and amber alert mainly in time scale involved.

Disaster Administration : Important steps towards this direction are;

Control Centre
An efficient execution of disaster plan needs effective control to meet the task. Key functionaries Organize, communicate and control the implementation of disaster plan.

Staff Report Board
Whenever key members of the staff arrive in the hospital, they report by telephone to the information center and whereabouts of each individual is plotted on staff report board to facilitate easy contact.
Information center

Information center is vital to pass on authentic information and minimize confusion and rumors. It should be put under the control of a senior person to coordinate with the control center and solve bottlenecks in operations.

Communication
Without communication, Information Control center can control nothing. Communication center must be established with modern facilities which should function round the clock.

CHECK YOUR PROGRESS 3

What are the important initiatives do you suggest in Disaster Response?

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14.8 DISASTER MANUAL

Manual is a must for each hospital. It serves to provide information, educate staff, helps in orienting new staff and help as a reference manual. All items in the plan should be presented in order of application and importance. The expression must be concise and clear. The manual should cover the following important aspects:

General hospital policies and procedures

Disaster Notification
Accident and Emergency Department
Special Duties and Responsibilities
Nursing Services
Departmental Duties and Responsibilities
Special Facilities
Staff Responsibilities

14.9 DISASTER DRILL

The disaster drill is to test the hospital preparedness and response to determine whether response was effective and efficient. In the absence of a real disaster, the success of plan prepared by the hospital can be tested and gaps can be identified. The system is put to rehearsal and the participants will be familiar when they have to handle real situations. The aim of the drill is to train, test, performance and to demonstrate weakness that requires changes.

Evaluation of the drill is an essential requirement and must be built in to disaster plan. It validated and complements planning and helps arrive at a critical assessment of the performance as under:

Whether the organizational methods provided in the plan were carried out in a timely and proper manner.
Whether medical care in the disaster area was adequate and efficient.
Whether the evacuation to hospital proceeded according to plan.
Whether intra hospital care was adequate, timely and speedy.

14.10 SUMMARY

In the lesson the concept of Disaster, it's process and management have been discussed at length. The focus is on internal preparedness and coordination with adequate planning and organization. The medical care during disaster events is really difficult as there will be a lot of chaos and confusion. Therefore, proper manuals must be developed with details for ready reference. Drilling and training improves the effectiveness of disaster management of hospitals.

14.11 KEY WORDS

DISASTER : Any calamity, natural or manmade involving destruction and suffering to the public that requires immediate rehabilitation, relief and medical care.

DISASTER SYNDROME: A form of shock or stress reaction during the aftermath of a disaster in which people suffer with acute disorientation and apparent loss of individual purpose or direction.

DISASTER RESPONSE : How the hospital views a disaster with certain anticipation, understanding and moves on immediately upon noticing a disaster.

DISASTER DRILL : Simulation or rehearsal of the actual situation and role play of different staff in response to an imagined disaster.

14.12 MODEL QUESTIONS

1. Discuss the important functions of Disaster Management?
2. Describe the elements of Disaster Planning Process?
3. What are the aspects of disaster plan?
4. How do you improve the effectiveness of Disaster Committee in a hospital?

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Lesson - 15

FIRE FIGHTING

Objectives

After studying this lesson, You will be able to:

Assess the magnitude of the problem of Hospital Fire

Examine the basic principals of hospital planning considerations in relation to the Fire emergency plan

.ist out the causes and sources of hospital fire and various types of fire fighting devices and :quipment, and

:xplain various structure planning and design consideration for fire detection and prevention.

Structure

15.1 INTRODUCTION

Fire is a potential hazard. Especially in hospitals the problem is very serious because of the difficulties and dangers associated with emergency evacuation of patients. When they occur, they should be rapidly detected and effectively controlled. In order to achieve this, the role of hospital management and the overall fire safety policies, fire prevention and fire protection measures in hospital premises assume higher significance. IN the same context, the physical factors like building design and construction, equipment, furnishings, installation and maintenance of alarm system, the policy towards fire prevention and the training for staff are the significant issues. They have been studied and discussed in detail.

15.2 ELEMENTS OF FIRE

Fire takes a heavy toll of human life through out the world. Perhaps, there would not be any other worst tragedy for the dead and the family members. As per statistics, fire has been ranked as the third largest accident killer next to motor vehicle accidents and accident falls.

Health care centers comprising of hospitals and Santeria fall under the sub-division C-1 under the main head Group C- ' Institutional Buildings' in accordance with the classification of buildings based on occupancy as incorporated in the National Building Code, part IV. The subdivision C-1 obviously includes any building or a group of buildings under one management which is used for housing persons suffering from physical limitations because of health or age, e.g., hospital infirmities, Santeria and nursing home. Therefore, hospital building fall within the purview of institutional buildings where a large number of visitors could be expected at the peak hours besides patients and hospital staff.

The three elements essential to start a fire anywhere can best be illustrated as a fire triangle. In the absence of the three elements, Oxygen, Material and heat, fire can not start and this fact is to be borne in mind while designing fire safety plans. Since oxygen can not be eliminated, planners should concentrate on restricting the fuel, i.e., inflammable material, substances, interior finish materials of the building. Third one is heat that may arise due to electric sparks, open flames, static electricity which ignite fire.

When the three factors work, fire poses a hazard. Another three factors that actually make fire a hazard are cause of fire, spread of fire and our response to fire. An effective plan for fire safety should address to all three factors adequately.

15.3 CAUSES OF HOSPITAL FIRE

Analysis of the most frequent causes of hospital fire indicates that human carelessness is the major factor in starting fires in a hospital and therefore, a major effort for combating fire should be directed towards education and motivation of various users of hospital.

MOST FREQUENT CAUSES OF HOSPITAL FIRE

Sl.No	Cause	Per cent
1	Smoking	33
2	Contractors Carelessness	18
3	Carelessness of Hospital Staff	16
4	Defective equipment	14
5	Visitors Carelessness	13
6	Defective wiring	03
7	Lighting and unknown causes	03
	Total	100

CHECK YOUR PROGRESS 1

List out the elements of Fire Accidents in your residential area?

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15.4 FIRE PROTECTION

Fire protection measures for multi-storied and high rise buildings have in general been discussed in Part IV of the National building Code and ISS 3844. Hospitals housed in multistoried buildings though not exactly falling in this category , high rise buildings need to be provided with fixed installation facilities and adequate means of escape for certain special reasons. In hospitals, majority of patients are incapable even to sit or walk, by their own feet, therefore, in a major fire,

intensive approach is necessary for large scale rescue operations and orderly evacuation. It is for these extra protective requirements, internal hydrant installations envisaging wet riser installation etc. is recommended for multi-storied hospital buildings irrespective of their heights etc.

15.5 STRUCTURAL DESIGN AND PLANNING CONSIDERATIONS

This aspect is single most important part where if due care is taken during planning and design period the accident rate and it's gravity can be reduced significantly, therefore one should learn this component in more details in the context of fire safety.

The degree of hazard in any structure bears direct relationship with the design of the building, type of occupancy, facilities provided for effective discharge of functional obligation, electrical installation provided in pursuant to the functional facilities, means of escape, compartmentation to keep the premises free from smoke logging and effects of radiated heat. To some extent it also depends on use of treated and untreated vegetable and synthetic fiber and plastics commonly used for upholstery, mattresses, bed and bedding. Identification of risk and quantification of fire protection facilities directly varies with the gravity of hazard in relation to the factors enumerated above. The gravity of potential risk generally encountered in hospitals are given below:

Building-Structure, Design, quality of building material and workmanship.
Building Services.
Central Air conditioning facilities
Electrical Installations and transformers etc.

Functional facilities or special hazards like provisioning of kitchen, laundry, boiler room, operation theatre, storage for gas cylinders, storage of radioactive material, laboratories and sensitive electrical installations.

The fire protection and prevention facilities in relation to the above elements are discussed below:

BUILDINGS:

Hospital planners follow a process of standardization for new premises based on a horizontal development in which standard hospital departments are linked together by a main common passageway/ corridor/ gallery at each level, together with standard form of vertical access, provided by lifts and stairways .The whole communication system is referred to as the 'harness communication zone', and the main backbone of this on each floor is known as the harness street. The whole building form, which is limited to 4 floors in height, is designed with in a master grid each square being 16.2 meters in length. Within this grid, series of modules are designed, each becoming a standard department, with alternate units becoming courtyards to provide natural lighting and ventilation. The maximum depth will be equal to 4 modules on each side of a harness zone. The structure proposed is made to offer one hour's fire resistance to both the structural frame and compartment walls between departments, The harness zone which is designed for the flow of people and the distribution of supplies and services is 10 meters wide, consisting of two main elements; the harness street and vertical linking, services, plant rooms and miscellaneous accommodation. The vertical linking part of the harness zone contains staircase lifts, ramps, escalators, chutes, ducts, plant rooms and some offices. All these, either individually or in a group, will form separate fire compartments apart from the harness street.

As a rule of thumb, structure of the building should offer fire resistance up to 2 hours. To keep the area free from smoking logging, lobby approach to lift and stair cases should be protected by a self closing door of atleast half an hour fire resistance. Self close dooor opening should be provided in the direction of escape. Two hours fire resistance could be achieved with brick work walls of 22 cms thickness or reinforced concrete of 10 cms floors. Protection to steel columns and beams is achieved with concrete of 4 cms thickness. Paneled door of minimum finished thickness of44 mm provides half an hour fire resistance. To achieve one hour fire resistance, minimum finished thickness of the door should be of the order of 54 mm.

Compartmentation: A very small percentage of causalities in fire are the result of direct burning and most people die due to severe exposure to heat and smoke, which mostly contain toxic gases. Human body can endeavor this punishment only to a limited degree and only for a very short duration. Taking heat first, the medical authorities believe that a skin temperature of 44 Deg. C will result in second degree burns and the temperature is unbearable if skin remains at that point for long enough. However, if the temperature is raised to 55 Deg. C similar burns will result in 20 seconds. Exposure time is reduced to one second at 65.5 DEG. C. Similarly, the air inhaled at higher temperature has serious effects on lungs etc. According to medical authorities, 149 Deg. C is the maximum survival temperature and that also for a very short time and not at all in humid conditions. Compartmentation in relation to fire safety means dividing the building or portion of the building into number of parts ensuring that resultant smoke and heat are confined to the place of origin for as long period as possible until fire is extinguished or safe evacuation is carried out. Compartmentation, properly designed and installed has been successful in limiting fires to the unit of origin. Smoke stop doors are also interposed between galleries and lobbies and between ward and ward and compartment and compartment to stop ingress of smoke. The smoke stop doors usually have a fire resistance of half an hour and shall be a single swing type opening in the direction of escape, placed across the corridors to give access to the staircases in their direction. It shall be fitted in a wall or screen having a fire resistance of not less than half an hour. Walls or screen may be incorporated with fixed glazing fire resistance rating of not less than half an hour.

BUILDING SERVICES

Each component of building services has been discussed below:

Electricity and Gas: These are the principal sources of energy for power, light, heat, in any building. Both of these are major sources of ignition where they are installed. The passage of electrical current generates heat, which may be used intentionally for functional facilities and space heating. Heat is also generated in electrical illumination wherever electricity is transmitted along a cable. All electrical equipment must be carefully rated according to the work it is expected to do. If it is overloaded, excessive heat will be generated leading to the appearance of spark of fire. Fires are also caused be defects in electrical equipment and through damage to electric wiring insulation. They are also caused by defects in allowing dry combustible materials to come in direct contact with electrical circuit.

LIFTS: Lifts are main evacuation system and should confirm with following norms:

*Walls of lift enclosure shall have a fire rating of 2 hours, and lift door shall have a fire resistance rating of one hour.

*Lift Motor room should be located on top of the shaft and fire extinguishers should be provided to deal with any electrical risk.

One lift bank should not accommodate more than four lifts.

Fire lifts should be worked with an independent source of power other than the source feeding the building.

Arrangement should exist that in case of power failure, automatic switchover to generator should be ensured.

BASEMENT

Each basement shall be sharply lighted and ventilated. The stair case of basement shall be closed type having fire resistance of not less than two hours and shall be situated at the periphery of the basement. If the travel distance exceeds 18.5 m , additional staircase at proper place shall be provided. Storage of corrosive chemicals, flammable liquids, gases or substances, which liberate toxic vapour on heating is not permitted in the basement.

L.P.G. Cylinders: Liquefied petroleum gases consisting of mixture of propane and butane are generally used in laboratory, kitchen and cafeteria as a source of energy. In the kitchen, a battery of cylinders are used at a time for supply of gas to the gas stove. To overcome shortage, about 25 to 30 charged cylinders are always kept in storage shed. The following points are worth consideration from fire prevention angle:

A common manifold connecting a series of cylinders must be equipped with an individual cylinder valve and should also carry a main control valve at the pipe leading to stoves.

Cylinders should be kept at a place separated by brick wall of 34 cms thick or by reinforced concrete wall of 15 cms thick so that the flame generated from the stove could be trapped inside.

The storage shed for cylinders should be located at an isolated place.

To avoid the chance of any spark by friction, a sand bed of 5 cms thickness should be provided.

No electrical conductors should be installed inside the storage shed.

' No Smoking ' board should be displayed at a conspicuous place near the storage shed.

CENTRAL AIRCONDITIONING FACILITIES

Following aspects must be taken care while installation of Air Conditioning.

AC ducts: AC ducts are the major cause for spread of fire in the building. To eliminate the chance of spread of fire through AC ducts, the following measures are recommended:

Insulation, lining and filters used should be of noncombustible material.

Air conditioning ducts must be provided with sound alarms when temperature exceeds a limit and also they must switch off the AC plant automatically.

AC plant room must be fitted with fire extinguishers.

ELECTRICAL INSTALLATION

Electrical services in general should confirm to the following provisions:
Wiring should be laid in separate duct with fire resistance.
Telephone lines, gas pipes and water main should never be laid in the duct used for electric cables.
Separate lines and pipes should be provided for operation of water pumps, lifts, staircases and corridor lighting.
Emergency lighting shall be provided in the staircase/ corridors.
A stand by generator should be installed to supply power to emergency lighting circuits.
Powerhouse should be equipped with a extinguisher of suitable capacity.
Transformers should be installed wih a fire resistance of 5 hours and they should be protected by an automatic high velocity water spray projection system.

SPECIAL HAZARDS

Certain areas in the hospital need to be given special attention from fire fighting point of view. They are,
Operation theatre is always having inflammable liquids and gases which may cause fire.
Presence of radioactive materials require the need for exercise of every precaution to avert fire.
Laundry rooms, Stores and kitchens should be provided with heat detectors.
Selecting the right type of furnishing material, curtains, dresses, beds and bedding material to minimize the spread of fire.

CHECK YOUR PROGRESS 2

Visit a corporate hospital and observe the structural design of its fire safety?

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15.6 FIRE POINTS AND ESCAPE ROUTES

Adequate number of fire points should be provided outside as well as inside the building at conspicuous places so that these are accessible from all directions. As per stipulated requirements, one fire point should be erected on each floor near the staircase and it should be equipped with the following first aid extinguishers:

Stored pressure type water extinguisher, 9 litre capacity	2
Dry power extinguisher 10 kg capacity	1
CO 2 Extinguisher 4.5 kg capacity	1
Ceiling hook	1

Water Buckets 2

Requisite number of CO 2 extinguishers of 2.0 capacity should be provided in corridors

* An internal board of officers must be constituted to identify the locations for erection of fire points.

ESCAPE ROUTES

In view of mass evacuation of patients, visitors and staff, escape routes are very important. In this connection, reference is invited to the contents of IS 3844 and part IV of the National Building Code which are the main guidelines followed by all concerned with in the country. Fire authorities in the area may be consulted in assessing the means of escape. Following points must be given due consideration.

The size of doors should be 3 units in width i.e., 1500 mm

Each ward must be provided with escape route with 2.5 meters breadth.

Ramps have to be constructed to move stretchers while evacuating on emergency.

Emergency lift has to be constructed to evacuate wheel carriage/ stretcher patients.

Enough space must be left on all sides of the structure to allow passage for fire engines.

Directional signs must be painted all over the building indicating exit points.

CHECK YOUR PROGRESS 3

Discuss the Fire fighting measures and Escape routes that should be arranged in a hospital?

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15.7 RISK EVALUATION

Generally, hospitals are located in old pre-existing buildings and it may not be possible now to change the design to suit the norms of safety. Still it is useful t undertake a risk evaluation of the hospital building before occupation. The risk evaluation is calculated from the point of the following five factors.

Patient's Mobility: It represents the degree to which patients must be assisted for their safety

Patient's Density: It refers to the number of people at risk in a fire zone

Fire Zone Location: It reflects the accessibility of the zone to the fire fighting facility, for suppression of fire and rescue operation.

Ratio of Patients to Attendant: The number of staff available in proportion to the number of patients in an emergency

Patient's Average Age: It reflects the age of the patients.
The total occupancy risk is therefore, the product of the fire factors and the calculated risk which should be considered in the planning stage.

15.8 SUMMARY

In the lesson, we have discussed about various aspects of fire accidents in health care setup. The knowledge and importance of these factors must be kept in mind while planning and designing a hospital building. Depending upon the fire hazard present in different parts of hospital premises, one can assess the need of first aid fire fighting appliances including hose reels, portable extinguishers and fixed fire protection system to cater for any special risk. Based on these factors, you can draw a fire plan of the hospital building indicating escape routes, compartmentation and other fire protection facilities and incorporate all these in routine fire evacuation mock drill.

15.9 KEY WORDS

COMPARTMENTATION : Dividing the building into number of parts ensuring that smoke and heat does not spread out of the place of fire into other parts before being extinguished.

FERE POINT : Any location in the building, where fire fighting equipment is erected and people can fight fire conveniently that arises around the point.

ESCAPE ROUTES : Different means of escape in the event of fire like elevator, stair case, ramp emergency elevator etc.

15.10 MODEL QUESTIONS

1. What are the five most important causes of hospital fire?
2. How compartmentation helps fighting fire in a big hospital?
3. Examine whether the electrical equipment and wiring as a potential source of fire?
4. How do we maximize safety of people by designing escape routes?
5. What is the rationale behind risk evaluation of a building?

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Lesson - 16

SECURITY SERVICES

16.0 Objectives

After going through the lesson, you should be able to:
List the goals and objectives of security management
Describe role and functions of Security as a Service in Hospital
Familiarize with the various aspects of protection, loss prevention and Security organization of hospital administration
Understand the legal aspects of Security

Structure

16.1 INTRODUCTION

Hospitals have the following unique characteristics;

They provide access to all any time any day throughout the year. Patient population and their relatives make the floating population high.

Staff of the hospital operates under continuous stress which may cause irrational, confrontation behavior giving rise to conflicts and aggression.

People near a hospital generally fall into three categories- patients, visitors and staff. Security will have a distinct relationship with each group.

The hospital security staff present a visible image of a service to the patients, visitors and staff, carefully combining with it the fundamental objective of security, which is protection of people and assets.

Most hospitals lack a professionally run security system.

Hospital security staff members need to be tactful, sensitive, patient and diplomatic, while dealing with situations in a stressful environment.

Hospitals are no longer sheltered or isolated from the anxieties of our society. Hospitals have to grow up to the growing challenges. According to a recent study carried in the US hospitals lose

about 10% of their purchase inventory due to preventable security lapses. The causes are mainly attributable to security in hospitals. It is treated as a peripheral function rather than a Vital objective of top management for protection of the facility's total assets- property, staff, patients, image and information.

The top management of a hospital is responsible to lay down the policy frame-work to integrate" Comprehensive Security" in organizational culture of a hospital. A well organized hospital security department and well trained security staff should assist in creating an atmosphere of safety, goodwill, service and human concern so that the patient care can be maximized.

16.2 SECURITY THREATS OF HOSPITALS

All hospitals are liable to seen and unseen vulnerabilities. A vulnerability in the context of hospitals can be defined as, "something that could lead to injury, harm,or threat to persons, property, ideals or image". In order to minimize this, every hospital has to evolve it's own security department to tackle common threats and vulnerabilities. They may be as follows:

Thefts- external or internal
Patients property losses
Employees property losses
Destruction or damage of property including vehicle accidents.

Informational loses, pertaining to confidential or privileged information, medical records of patients, research material and computer security

Assaults or robbery upon employees, staff or visitors

Fire and arson
Violation of work safety norms, including environment pollution, hazards to safety, health and hygiene

Anti- national activities- bomb threats, sabotage and subversion of employees
Threats to medical and non medical executives or their family members
Drug theft and drug abuse
Internal or external disasters

Medical imposters

White collar crimes like corrupt practices by unethical employees
Cases of sexual assault
Strikes or civil disturbances

Infant abduction
The above threats may emanate from any of the following sources

Criminals
Disgruntled Patients/ former patients/ relatives/ employees/ former employees or their friends
Members of the public with real or imagined grievances
Terrorists/ sympathizers

Security Sensitive Areas/ Functions of Hospitals

There are a number of places and functions, in a hospital, that can be considered security sensitive. Some of the more sensitive area and functions of a hospital are listed below

Pharmacy
Cash handling areas
Medical records Office
Emergency Department
Computer Centre
Infant and Pediatric Units
Parking Areas

A pragmatic assessment by the hospital administration of security vulnerabilities and visualization of threats must form basis for formulation of an efficient and cost-effective security management plan of a hospital. Hospitals have become attractive targets to crime because of valuable equipment, materials, and drugs. Hospital management must therefore, constantly, assess, evaluate and minimize security threats through appropriate security policies.

CHECK YOUR PROGRESS 1

List some of the security threats to hospitals?

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16.3 ROLE AND FUNCTIONS OF SECURITY SERVICES

The role of hospital security department is," to provide security services to All staff, patients and visitors and for protection of hospital property on the premises, through use of well trained personnel, technology, prevention activities and timely response to requests". It involves treating people equally and with total care and respect, regardless of their gender, religion, age, handicap or any other factor which may put them in a minority category.

Functions of hospital security department are:

Analysis of security threats and vulnerabilities in conjunction with the management, civil police and others.

Preparation of strategic security plan, security standing instructions and security operational deployment plan and their periodic updating, based on directions of the management.

Organisation and monitoring of security operations and implementation of security plans to achieve elimination/ reduction of incidence of theft/ pilferage of property/ information and crime on premises.

Advising hospital management on all security matters

Conduct of inquiries / investigations, as directed by the management in a professional, efficient and confident manner.

Conduct of initial, 'on the job' and refresher security training, as relevant for all segments of hospital staff.

Surveillance and patrolling of the premises

Access control, issue and record keeping of identity documents for the employees, contract and casual staff and visitors.

Control of movement of vehicular traffic within the premises and in it's immediate vicinity, falling under limits of external control of the management.

Reception and conduct of visitors and attendants

Assistance with pooled manpower for fire control and emergency plan

Assistance in monitoring implementation of fire and safety instructions and accident prevention.

Represent management in mutual aid deliberation as directed

To keep aware of potential threats of criminal activity, through liaison with civil police and other appropriate agencies.

Vigilance and intelligence duties, as assigned.

Performance of any other tasks and functions, as may be assigned by the management.

An efficient and effective security service will safeguard the interests of the hospital in a long way.

CHECK YOUR PROGRESS 2

Analyse the functions of hospital security department ?

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16.4 SECURITY ORGANISATION AND SECURITY MEASURES

A hospital may vary in size, place, ownership etc., but the security it requires must be professional for ensuring efficient loss prevention and organization of the security functions. It is important that the security's control is kept under a single agency. Number security personnel will be under the direct control of the Managing Director of the hospital.. They are:

Chief Security Officer
Security Supervisors

Security guards

The security staff may be departmental, agency or a mix of both. However, most of the hospitals are outsourcing security services to achieve efficiency and cost effectiveness.

Physical Security Measures
Physical security measures are vital element of any hospital's security system. These measures should be Planned in-depth, as a single barrier system fails to provide total security. These measures can only be expected to act as physical deterrents, ' to discourage the undetermined and delay the determined' and need to be backed up by a series of other contributory measures.

Premier Protection System

It comprises:
Outer Protective Ring: Fencing or walls to define the ownership and to channelize movement.

Middle Protective Ring: Exteriors of the buildings comprise the middle ring.

Inner Protective Ring : Within the hospital, a number of protective rings should be established to safeguard vulnerable/ sensitive areas, e.g., Pharmacy, Offices, Medical records, Computer Room, Telephone Exchange, Cashiers locations, Infant Security, Laundry, Kitchen/ Stores etc.

Implementing Physical Controls

Hospital administrators are often reluctant to implement such physical control which may reduce friendly atmosphere between visitors and staff. This attitude has to be balanced with a judicious mix of physical controls to ensure minimization of losses and to enable patient care. Traditionally, the administrators respond to security problems by increasing the security manpower. This philosophy needs to be reviewed in the light of available and effective security technology devices, which are coming available in a cost effective manner.

The hospital administration must constantly review the security organization and it's composition, based on ever changing threats and vulnerabilities. Physical Security controls are only one component of a hospital security system and can not be the sole means of protection. They have to be complemented by correct policy, security procedures, staffing and operational control, reinforced by technology devices.

16.5 ACCESS CONTROL CONCEPTS
Access control is 'controlling the movement of people '. It mens permission or denial of entrance to a given premises or within a defined place against unauthorised observations or removal and to prevent injury to persons or damage to things.

In hospitals, checking people entering or leaving a building is a form of access control. Essential aspects of access control system are:

Identification system for staff: Hospital management must make it mandatory for all staff members to display identification badges all the time to allow them access to the premises or specified segments therein , while on duty. Failure to produce identity badge regardless of

designation or seniority, will subject individuals to being challenged and reported for possible disciplinary action. An identification badge should include the following details:

Logo of the hospital and serial number

A photograph fixed permantely
Name of the individual in big bold letters which can be read from three feet.

Individual's job title and area of work
Temporary Identification Badges: The badges should be used as a form of access control for contractors, visitors and casual workers.

Card Access System: Card access system requires a plastic rectangular card, which needs to be passed through a wall mounted reader.

Locks and Keys: Locks restrict movement of people into or within certain areas like computer room, stores, pharmacy etc. Locks must be controlled by a centralized key cabinet.

The system should be designed according to the needs of the hospital and reviewed from time to time to prevent breackages in the security system.

CHECK YOUR PROGRESS 3

Analyse the components of access control system?

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16.6 SECURITY TECHNOLOGY

Security systems are changing very fast. Human however efficient may be have certain limitations on biological and physical front. To supplement human efforts and achieve maximum effectiveness technology is being used in all areas of security services.

A security technology plan needs to be implemented for integration of security equipment, which would strengthen the quality of monitoring and supervision. The following types of equipment should be considered.

CCTV for surveillance at selected locations
Access control equipment
Intrusion Detection Devices
Guard Watch Equipment to monitor regularity of search patrols
Alarms
Security Lighting
Security Communications and Walkie-talkie sets.
Metal and Explosive Detectors
Computer and Information Security

Key assignments of EDP staff should be identified and a verification system should be instituted.
Simultaneous update of Important data and programs.
Regular backups of data and programs. It should be duly Indexed
Annual Maintenance Contract (AMC) should be carried out under supervision of EDP staff.
Formal training for new entrants
Anti-Virus Precautions
Allocation of computers for security operations

16.7 MANAGERIAL ISSUES IN SECURITY SERVICES

A hospital has two alternatives of security systems. To own your system or to hire the best one around. Hospital management must evaluate the pros and cons of the two alternatives and decide on the best one. However, they may also mix both the systems to gain maximum advantage.

Selection of Security Agency : Following aspects must be taken care of.
Establishing objectives of Security Services
Notification Inviting bids
Submission of bids by agencies
Final Selection of the agency
Verification the Agency Record
Police Advice and Inquiry
Finalization of Security Services Contract
Security Training
Continuous Training is a must through a professional body under the control of Chief Security Manager

Induction Training	15 to 30 Hours
On the job training	15 Hours
Refresher Training	One Week duration every 6 months
Security Awareness Programs	10 hours a year

Security manpower must be paid properly inorder to deliver quality security services. They must be preferably drawn from the Exarmy , Expolice personnel for effective service since they were trained in this responsibilities.

16.8 LEGAL ISSUES IN SECURITY SERVICES

Security Service involves following the norms laid down by the hospital. However, these norms should not in any way inconvenience the consumers of hospital service as any offensive behavior on behalf of security personnel may have legal implications to the hospital management.
It is pertinent at this juncture to focus on some of the provisions of the Indian Penal Code (IPC) involving rights of people in general.
Right of Private Defence : Nothing is an offence, which is done in the exercise of private defence. Firstly his own body and the body of any other person, against any offence against the human body.

Theft: A theft is always committed in relation to moveable property.
Pilferage: Is removal of small items due to temptation of daily needs like pencils, pens, food etc.

Robbery: Robbery is an aggravated form of theft. The most important element of robbery is the presence of imminent force or violence.
Dacoity : When five or more persons jointly commit a robbery, it will amount to dacoity.
Mischief : Whoever causes or intends to cause or knows that he is likely to cause loss or damage to the security of the property, commits an offence of mischief.
Criminal Trespass : Whoever enters into the property of another with an intention to commit the offence or to intimidate, to insult or to annoy the owner of the property, commits the offence of criminal tress pass.
The hospital security officials do not enjoy the authority normally vested in the civil police authorities. They may with the authorization of the administration temporarily detain, search or inspect any person till the case is handed over to the police according to the lawful prosecution.

Security function in a hospital is sensitive, challenging and responsible task. It has to be discharged properly with utmost care.

16.9 SUMMARY

You have learned the importance of Security Services in the lesson. Different types of Security threats have been studied in view of the changing requirements of corporate hospitals. The role and functions of Security services is defined and the techniques and technology used in security organisation have been properly examined. Some of the managerial issues have been covered. The legal issues involved in discharging the duty of security are included in the end.

16.10 KEY WORDS

VULNERABILITY : Something that could lead to injury, harm, or threat to persons, property, ideals or image.
ACCESS CONTROL : Controlling the movement of people including vehicles.
THREAT GROUP : Any group that has the potential to cause security risk to a hospital in a situation or place.

16.11 MODEL QUESTIONS

1. How do you estimate the Security Threats and Vulnerabilities of a hospital?
2. What type of Roles are played by Security Services in Hospitals?
3. Analyse the Significance of Access Control in a Hospital?
4. How can we use latest Technology in Hospitals?
5. How do you balance between the consumer right to access and providing security to hospital?

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(కత్తిరించి పంపవలెను)

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Course	Paper No. & Title
P.G.D. in Hospital and Health Care Management	Paper - IV : Diagnostic, Support and Utility Services

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