105HA26

by Cde Anu

Submission date: 08-Dec-2025 03:24PM (UTC+0530)
Submission ID: 2839773778
File name: 105HA26_total.pdf (4.7M)
Word count: 63360
Character count: 360753

MEDICAL TERMINOLOGY, CLINICAL, DIAGNOSTIC AND THERAPEUTIC SERVICES

MASTER OF BUSINESS ADMINISTRATION (HOSPITAL ADMINISTRATION)

FIRST YEAR, SEMESTER-I, PAPER-V

DIRECTOR, I/c.

Prof. V. Venkateswarlu

M.A., M.P.S., M.S.W., M.Phil., Ph.D.

CENTRE FOR DISTANCE EDUCATION
ACHARYA NAGARJUNA UNIVERSITY
NAGARJUNA NAGAR 522 510

Ph: 0863-2346222, 2346208
0863- 2346259 (Study Material)
Website www.anucde.info
E-mail: anucdedirector@gmail.com

MBA (HA): MEDICAL TERMINOLOGY, CLINICAL, DIAGNOSTIC AND THERAPEUTIC SERVICES

First Edition : 2025

No. of Copies :

This book is exclusively prepared for the use of students of MASTER OF BUSINESS ADMINISTRATION (Hospital Administration) Centre for Distance Education, Acharya Nagarjuna University and this book is meant for limited circulation only.

Published by:

Prof. V. VENKATESWARLU
Director, I/c
Centre for Distance Education,
Acharya Nagarjuna University

Printed at:

FOREWORD

Since its establishment in 1976, Acharya Nagarjuna University has been forging ahead in the path of progress and dynamism, offering a variety of courses and research contributions. I am extremely happy that by gaining 'A+' grade from the NAAC in the year 2024, Acharya Nagarjuna University is offering educational opportunities at the UG, PG levels apart from research degrees to students from over 221 affiliated colleges spread over the two districts of Guntur and Prakasam.

The University has also started the Centre for Distance Education in 2003-04 with the aim of taking higher education to the door step of all the sectors of the society. The centre will be a great help to those who cannot join in colleges, those who cannot afford the exorbitant fees as regular students, and even to housewives desirous of pursuing higher studies. Acharya Nagarjuna University has started offering B.Sc., B.A., B.B.A., and B.Com courses at the Degree level and M.A., M.Com., M.Sc., M.B.A., and L.L.M., courses at the PG level from the academic year 2003-2004 onwards.

To facilitate easier understanding by students studying through the distance mode, these self-instruction materials have been prepared by eminent and experienced teachers. The lessons have been drafted with great care and expertise in the stipulated time by these teachers. Constructive ideas and scholarly suggestions are welcome from students and teachers involved respectively. Such ideas will be incorporated for the greater efficacy of this distance mode of education. For clarification of doubts and feedback, weekly classes and contact classes will be arranged at the UG and PG levels respectively.

It is my aim that students getting higher education through the Centre for Distance Education should improve their qualification, have better employment opportunities and in turn be part of country's progress. It is my fond desire that in the years to come, the Centre for Distance Education will go from strength to strength in the form of new courses and by catering to larger number of people. My congratulations to all the Directors, Academic Coordinators, Editors and Lesson-writers of the Centre who have helped in these endeavors.

Prof. K. Gangadhara Rao
M.Tech., Ph.D.,
Vice-Chancellor I/c
Acharya Nagarjuna University.

MASTER OF BUSINESS ADMINISTRATION
(HOSPITAL ADMINISTRATION)

Programme Code: 197

PROGRAMME SYLLABUS

1st YEAR – 1st SEMESTER SYLLABUS

19

105HA26: MEDICAL TERMINOLOGY, CLINICAL, DIAGNOSTIC AND THERAPEUTIC SERVICES

Unit - I Introduction: Primary care, Secondary care, Tertiary care; Rural Medical care, Urban medical care; Curative care & Preventive care; General & Special Hospitals; Clinical Terms; Common Terms of Healthcare Management: Terms related to levels of healthcare, Primary, Secondary and Tertiary; Systems of Medicine: Ayurveda, Siddha, Unani, Homeopathy, Yoga, Naturopathy, Reiki, etc

Unit - II Outpatient & Inpatient services: Medical services; Surgical services; Pediatric services; Dental services; Psychiatric services; Casualty & Emergency services; Hospital Laboratory services; Anesthesia services; Obstetrics and Gynecology services; Neuro-Surgery service; Neurology services; Intensive care unit; Coronary care unit; Burns, paraplegic & malignant disease treatment; Nursing services.

Unit – III Medical Terminology: Glossary of medical terms: Major diseases and medical specialties: Roots, Prefixes, Suffixes, Abbreviations and symbols; Common roots: element referring to, usage and definition; Common prefixes and suffixes; Common abbreviations: departments, time, general healthcare, routes of medication and laboratory; Symbols.

Unit -IV Specialty-wise terminology: Pathology terms of common use; Diagnostic and therapeutic terms; Pediatric services; ENT; Ophthalmology; Orthopedics; Dermatology: Cardiology

Unit - V Principles and methods of organizing, clinical and support services for hospitals; Role of support services in hospital functioning;

Reference Books:

1. Mogli GD: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001.
2. Francis CM, Mario C de Souza: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. Tabish, S. A. (2001). Hospital and health services administration: Principles and practice. New Delhi: Oxford University Press.
4. Rowland HS, Rowland BL: Hospital Administration Handbook, Aspen System Corporation: Rockville, 1984.
5. BM Sakharkar, Principles of Hospital Administration and Planning – Jaypee brothers publications.
6. Medical records manual: A guide for Developing countries WHO regional office, stylus Publication.

CONTENTS

LESSON-1

LEVELS OF HEALTHCARE

OBJECTIVES:

The objectives of this lesson are to:

- To understand the overview of Health system
- To understand Primary care, secondary and tertiary care
- To know the Rural and Urban Medical care
- To understand curative care and Prevention care
- To know the levels of prevention

STRUCUTURE:

1.1 INTRODUCTION & OVERVIEW OF INDIAN HEALTHCARE SECTOR:

Healthcare has become one of India's largest sectors, both in terms of revenue and employment. Healthcare comprises hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment. The Indian healthcare sector is growing at a brisk pace due to its strengthening coverage, services and increasing expenditure by public as well private players.

India's healthcare delivery system is categorised into two major components public and private. India's competitive advantage lies in its large pool of well-trained medical professionals. India is also cost competitive compared to its peers in Asia and Western countries. The cost of surgery in India is about one-tenth of that in the US or Western Europe. In FY21, gross direct premium income underwritten by health insurance companies grew 13.3% YoY to Rs. 58,572.46 crore (US$ 7.9 billion). The health segment has a 29.5% share in the total gross written premiums earned in the country.

The Indian medical tourism market was valued at US$ 2.89 billion in 2020 and is expected to reach US$ 13.42 billion by 2026. The e-health market size is estimated to reach US$ 10.6 billion by 2025.

1.2 Health system:

A health system, also sometimes referred to as health care system or healthcare system is the organization of people, institutions, and resources to deliver health care services to meet the health needs of target populations.

Healthcare is the maintenance or improvement of health via the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings. Healthcare is delivered by health professionals (providers or practitioners) in allied health professions, chiropractic, physicians, physician associates, dentistry, midwifery, nursing, medicine, optometry, pharmacy, psychology, and other health professions. It includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health.

Access to health care may vary across countries, groups, and individuals, largely influenced by social and economic conditions as well as the health policies in place. Countries and jurisdictions have different policies and plans in relation to the personal and population-based health care goals within their societies.

Healthcare systems are organisations established to meet the health needs of target populations. Their exact configuration varies between national and sub national entities. In some countries and jurisdictions, health care planning is distributed among market participants, whereas in others, planning occurs more centrally among governments or other coordinating bodies. In all cases,

According to the World Health Organization (WHO), a well-functioning healthcare system requires

- a robust financing mechanism
- a well-trained and adequately paid workforce
- reliable information on which to base decisions and policies
- well maintained health facilities
- logistics to deliver quality medicines and technologies

Healthcare can contribute to a significant part of a country's economy. Health care is conventionally regarded as an important determinant in promoting the general physical and mental health and well-being of people around the world. An example of this was the worldwide eradication of smallpox in 1980, declared by the WHO as the first disease in human history to be completely eliminated by deliberate health care interventions.

1.3 Health Care Delivery:

The delivery of modern health care depends on groups of trained professionals and paraprofessionals coming together as interdisciplinary teams. This includes professionals in medicine, psychology, physiotherapy, nursing, dentistry, midwifery and allied health, plus many others such as public health practitioners, community health workers and assistive personnel, who systematically provide personal and population-based preventive, curative and rehabilitative care services.

While the definitions of the various types of health care vary depending on the different cultural, political, organizational and disciplinary perspectives, there appears to be some consensus that primary care constitutes the first element of a continuing health care process, that may also include the provision of secondary and tertiary levels of care. Healthcare can be defined as either public or private.

1.4 Primary care:

Primary care refers to the work of health professionals who act as a first point of consultation for all patients within the health care system. Such a professional would usually be a primary care physician, such as:

- a general practitioner or family physician,
- a licensed independent practitioner such as a physiotherapist, or
- a non-physician primary care provider (mid-level provider) such as a physician assistant or nurse practitioner.

Depending on the locality, health system organization, and sometimes at the patient's discretion, they may see another health care professional first, such as a pharmacist, a nurse (such as in the United Kingdom), a clinical officer (such as in parts of Africa), or an Ayurvedic or other traditional medicine professional (such as in parts of Asia). Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

Primary care is often used as the term for the health care services which play a role in the local community. It can be provided in different settings, such as Urgent care centres which provide services to patients same day with the appointment or walk-in basis. Primary care involves the widest scope of health care, including all ages of patients, patients of all socioeconomic and geographic origins, patients seeking to maintain optimal health, and patients with all manner of acute and chronic physical, mental and social health issues, including multiple chronic diseases. Consequently, a primary care practitioner must possess a wide breadth of knowledge in many areas.

Continuity is a key characteristic of primary care, as patients usually prefer to consult the same practitioner for routine check-ups and preventive care, health education, and every time they require an initial consultation about a new health problem. The International

Classification of Primary Care (ICPC) is a standardised tool for understanding and analysing information on interventions in primary care by the reason for the patient visit.

Common chronic illnesses usually treated in primary care may include, for example: hypertension, diabetes, asthma, COPD, depression and anxiety, back pain, arthritis or thyroid dysfunction. Primary care also includes many basic maternal and child health care services, such as family planning services and vaccinations.

In the context of global population aging, with increasing numbers of older adults at greater risk of chronic non-communicable diseases, rapidly increasing demand for primary care services is expected in both developed and developing countries. The World Health Organization attributes the provision of essential primary care as an integral component of an inclusive primary health care strategy.

1.5 Secondary care:

Secondary care includes acute care: necessary treatment for a short period of time for a brief but serious illness, injury or other health condition, such as in a hospital emergency department. It also includes skilled attendance during childbirth, intensive care, and medical imaging services.

The term "secondary care" is sometimes used synonymously with "hospital care". However, many secondary care providers do not necessarily work in hospitals, such as psychiatrists, psychologists, occupational, most dental specialties or physiotherapists (physiotherapists are also primary care providers, and a referral is not required to see a physiotherapist), and some primary care services are delivered within hospitals. Depending on the organization and policies of the national health system, patients may be required to see a primary care provider for a referral before they can access secondary care.

Allied health professionals, such as physical therapists, respiratory therapists, occupational therapists, speech therapists, and dieticians, also generally work in secondary care, accessed through either patient self-referral or through physician referral.

1.6 Tertiary care:

Tertiary care is specialized consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital.

Examples of tertiary care services are cancer management, neurosurgery, cardiac surgery, plastic surgery, treatment for severe burns, advanced neonatology services, palliative, and other complex medical and surgical interventions.

1.7 Quaternary care:

The term quaternary care is sometimes used as an extension of tertiary care in reference to advanced levels of medicine which are highly specialised and not widely accessed. Experimental medicine and some types of uncommon diagnostic or surgical procedures are considered quaternary care. These services are usually only offered in a limited number of regional or national health care centres.

1.8 Home and community care:

Many types of health care interventions are delivered outside of health facilities. They include many interventions of public health interest, such as food safety surveillance, distribution of condoms and needle-exchange programmes for the prevention of transmissible diseases.

They also include the services of professionals in residential and community settings in support of self-care, home care, long-term care, assisted living, treatment for substance use disorders and other types of health and social care services.

Community rehabilitation services can assist with mobility and independence after loss of limbs or loss of function. This can include prosthesis, orthotics or wheelchairs.

Many countries, especially in the west are dealing with aging populations, and one of the priorities of the health care system is to help seniors live full, independent lives in the comfort of their own homes. There is an entire section of health care geared to providing seniors with help in day-to-day activities at home, transporting them to doctor's appointments, and many other activities that are so essential for their health and well-being.

With obesity in children rapidly becoming a major concern, health services often set up programs in schools aimed at educating children in good eating habits; making physical education compulsory in school; and teaching young adolescents to have positive self-image.

1.9 Rural Medical Care:

In medicine, rural health or rural medicine is **the interdisciplinary study of health and health care delivery in rural environments**. The concept of rural health incorporates many fields, including geography, midwifery, nursing, sociology, economics, and telehealth or telemedicine.

Rural context

***1.9.1 The social environment*:**

- Rural elders have significantly poorer health status than urban elders.
- Rural residents smoke more, exercise less and have poor diets.
- Need for a focus on prevention and a healthy lifestyle.
- Rural areas have higher levels of unemployment, poverty, and lower levels of education.

Despite negative health behaviors, many aspects of rural social life contribute to positive health outcomes. The strengths of rural areas are stronger social networks, social ties of long duration, shared life experiences, some level of self-help, and reciprocity.

***1.9.2 The physical environment*:**

• Rural women are less educated and are more sedentary than urban women
• Insufficiencies in facilities and infrastructure make it difficult for rural residents to exercise and maintain healthy habits

Access to health and social service: Evidence indicates that

- rural residents have limited access to health care
- rural areas are underserved by physicians
- many rural individuals must travel substantial distances for basic medical care

Problems of Rapid Urbanization

More than 50% of the world's population now lives in urban areas. Urbanization includes

- considerable changes in the ways in which people live,
- how they earn their livelihoods,
- the food which they eat, and
- the wide range of environmental factors to which they are exposed

The assumption that urban populations will be healthier than their rural counterparts and that urbanization means modernization is not true. Aspects of urbanization that influence health usually indicate increased health hazards. With the onset of modernization it was thought that the burden of disease would shift from infectious to chronic causes. While this transition does exist in some extent, today it is more appropriate to talk about a "double burden" of disease, both infectious and chronic. To understand urban health and the phenomenon of urbanization, we must look at the characteristics of the urban context that influence health and well-being. This will include methods relevant to the study of urban health like epidemiology, health policy, and urban planning. In addition, practical issues for developing healthy cities should be addressed, such as preventive strategies, the provision of health services, and education.

1.10 What's Different about Rural Health Care?

The obstacles faced by health care providers and patients in rural areas are vastly different than those in urban areas. Rural people face a unique combination of factors that create disparities in health care not found in urban areas. Economic factors, cultural and social differences, educational shortcomings, lack of recognition by legislators and the sheer isolation of living in remote rural areas all conspire to impede rural people in their struggle to lead a normal, healthy life. Some of these factors, and their effects, are listed below.

- Very few physicians practice in rural areas despite the fact that nearly three fourths of the population lives in these areas.
- Rural residents tend to be poorer.
- Abuse of alcohol and use of tobacco is a significant problem among rural people.
- The suicide rate among rural men is significantly higher than in urban areas, particularly among adult men and children.
- Rural residents have greater transportation difficulties reaching health care providers, often traveling great distances to reach a doctor or hospital.

1.11 Urban Medical care:

Urban health is the study of urban characteristics – including features of the social and physical environment and features of the urban resource infrastructure – that can influence health and disease in the urban context. Global demographic trends suggest urban living has become normative and thus there is an urgent need to consider how urban living may influence the health of populations. The study of urban health requires a multidisciplinary perspective that can consider different types of studies, including inter- and intra urban studies and urban–rural comparisons, and employs a multiplicity of methods including qualitative and quantitative methods.

Urban Health

The social environment: Urban environments have the following issues:

- Large populations

- Huge inequalities in socioeconomic status,
- Higher rates of crime and violence,
- Presence of marginalized populations (e.g., sex workers) with high risk behaviors,
- Higher prevalence of psychological stressors

The physical environment: In densely populated urban areas, there is often

- A lack of facilities and outdoor areas for exercise and recreation
- Air quality is lower which can contribute to chronic diseases such as asthma.
- Large slums which lack basic sanitation and utilities such as water and electricity
- Lack of basic infrastructure can exacerbate rates of infectious disease and further perpetuate the cycle of poverty.

Access to health and social services:

- Large numbers of people of lower socioeconomic status and minorities who lack health insurance
  - ✓ these populations face barriers to care
  - ✓ receive poorer quality care
  - ✓ They usually use emergency systems when their health deteriorates
- Undocumented immigrants and transient populations in cities are also without health insurance. This creates a greater burden on available systems. This often leads to vast disparities in health care outcomes as well as a two-tiered health care system where insured individuals have access to preventive and routine health care while marginalized populations utilize "safety-net" emergency room care

2. URBAN VERSUS RURAL HEALTH

Differences between urban and rural health care are usually expressed in terms of:

- Healthcare availability and access
- Utilization of services
- Cost of providing health care, transportation costs etc.
- Availability and accessibility of providers
- Geographic distribution of services

Due to rapid urbanization in recent years, there have been changes in global political, economic and social environments in all fields. Thus, the health of urban populations has changed as cities have evolved. As more people worldwide live in cities, it is necessary to understand how urban living affects population health positively or negatively

1.13 Curative care:

Curative care or curative medicine is **the health care given for medical conditions where a cure is considered achievable, or even possibly so, and directed to this end**.

Function

- ✓ It is the primary function of the hospital and concerned with providing patient care
- ✓ It referes to any type of care given to the patients by the health team members for ex. Physician, nurse, dietician
- ✓ Also includes health education to patients

1.14 Preventive care:

Preventive healthcare (alternately preventive medicine or prophylaxis) consists of measures taken for disease prevention, as opposed to disease treatment. Just as health encompasses a variety of physical and mental states, so do disease and disability, which are

affected by environmental factors, genetic predisposition, disease agents, and lifestyle choices. Health, disease, and disability are dynamic processes which begin before individuals realize they are affected. Disease prevention relies on anticipatory actions that can be categorized as primal, primary, secondary, and tertiary prevention.

Each year, millions of people die of preventable deaths. Leading causes included cardiovascular disease, chronic respiratory disease, unintentional injuries, diabetes, and certain infectious diseases, a poor diet and a sedentary lifestyle. According to estimates made by the World Health Organization (WHO), two thirds of deaths are from non-communicable diseases, including cancer, diabetes, and chronic cardiovascular and lung diseases.

There are many methods for prevention of disease. It is recommended that adults and children aim to visit their doctor for regular check-ups, even if they feel healthy, to perform disease screening, identify risk factors for disease, discuss tips for a healthy and balanced lifestyle, stay up to date with immunizations and boosters, and maintain a good relationship with a healthcare provider.

Some common disease screenings include

- checking for hypertension (high blood pressure),
- hyperglycaemia (high blood sugar, a risk factor for diabetes mellitus),
- hypercholesterolemia (high blood cholesterol),
- screening for colon cancer, depression, HIV and other common types of sexually transmitted disease such as chlamydia, syphilis, and gonorrhea, mammography (to screen for breast cancer), colorectal cancer screening, a pap test (to check for cervical cancer), and screening for osteoporosis
- Genetic testing can also be performed to screen for mutations that cause genetic disorders or predisposition to certain diseases such as breast or ovarian cancer

However, these measures are not affordable for every individual and the cost effectiveness of preventive healthcare is still a topic of debate.

1.15 Levels of prevention:

Preventive healthcare strategies are described as taking place at the primal, primary, secondary, and tertiary prevention levels.

a. ***Primordial prevention***: Primordial prevention refers to measures designed to avoid the development of risk factors in the first place, early in life.
b. ***Primary prevention***: Methods to avoid occurrence of disease either through eliminating disease agents or increasing resistance to disease. Examples include immunization against disease, maintaining a healthy diet and exercise regimen, and avoiding smoking.
c. ***Secondary prevention***: Methods to detect and address an existing disease prior to the appearance of symptoms. Examples include treatment of hypertension (a risk factor for many cardiovascular diseases), cancer screenings.
d. ***Tertiary prevention***: Methods to reduce the harm of symptomatic disease, such as disability or death, through rehabilitation and treatment. Examples include surgical procedures that halt the spread or progression of disease.
e. ***Quaternary prevention***: Methods to mitigate or avoid results of unnecessary or excessive interventions in the health system

1.16 Primary prevention:

Primary prevention consists of traditional "health promotion" and "specific protection." Health promotion activities are current, non-clinical life choices. For example, eating nutritious meals and exercising daily, that both prevent disease and create a sense of overall well-being. Preventing disease and creating overall well-being, prolongs our life expectancy. Health-promotional activities do not target a specific disease or condition but rather promote health and well-being on a very general level.

On the other hand, specific protection targets a type or group of diseases and complements the goals of health promotion. In the case of a sexually transmitted disease such as syphilis health promotion activities would include avoiding microorganisms by maintaining personal hygiene, routine check-up appointments with the doctor, general sex education, etc. whereas specific protective measures would be using prophylactics (such as condoms) during sex and avoiding sexual promiscuity.

1.17 Secondary prevention:

Secondary prevention consists of "early diagnosis and prompt treatment" to contain the disease and prevent its spread to other individuals, and to prevent potential future complications and disabilities from the disease. For example, early diagnosis and prompt treatment for a syphilis patient would include a course of antibiotics to destroy the pathogen and screening and treatment of any infants born to syphilitic mothers.

1.18 Tertiary prevention:

Tertiary prevention attempts to reduce the damage caused by symptomatic disease by focusing on mental, physical, and social rehabilitation. Unlike secondary prevention, which aims to prevent disability, the objective of tertiary prevention is to maximize the remaining capabilities and functions of an already disabled patient. Goals of tertiary prevention include:

- ✓ preventing pain and damage,
- ✓ halting progression and complications from disease, and
- ✓ restoring the health and functions of the individuals affected by disease

Rehabilitation includes measures to prevent complete disability from the disease, such as implementing work-place adjustments for the blind and paralyzed or providing counseling to restore normal daily functions to the greatest extent possible

Leading causes of preventable death worldwide:

a) Hypertension
b) Smoking
c) High cholesterol
d) Malnutrition
e) Sexually transmitted infections
f) Poor diet, Overweight and obesity
g) Physical inactivity
h) Alcohol
i) Indoor air pollution from solid fuels
j) Unsafe water and poor sanitation.

1.19 Summary: Healthcare has become one of India's largest sectors, both in terms of revenue and employment. Healthcare comprises hospitals, medical devices, clinical trials, outsourcing, telemedicine, medical tourism, health insurance and medical equipment.

Healthcare is the maintenance or improvement of health via the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings. Healthcare is delivered by health professionals (providers or practitioners) in allied health professions, chiropractic, physicians, physician associates, dentistry, midwifery, nursing, medicine, optometry, pharmacy, psychology, and other health professions. It includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health.

1.20 Key Words:

Health system **:** A health system, also sometimes referred to as health care system or healthcare system is the organization of people, institutions, and resources to deliver health care services to meet the health needs of target populations.

Primary care **:** Primary care refers to the work of health professionals who act as a first point of consultation for all patients within the health care system. Such a professional would usually be a primary care physician

Secondary care **:** Secondary care includes acute care: necessary treatment for a short period of time for a brief but serious illness, injury or other health condition, such as in a hospital emergency department.

Territory care **:** Tertiary care is specialized consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital

Urban medical care **:** Urban health is the study of urban characteristics – including features of the social and physical environment and features of the urban resource infrastructure – that can influence health and disease in the urban context

1.21 Self-Assessment Questions:

1) Give an overview of various levels of Healthcare in India?
2) write in detail about Rural and urban Healthcare
3) Briefly explain Preventive and curative care

1.22 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-2

GENERAL & SPECIAL HOSPITALS

OBJECTIVES:

The Objectives of this lesson are

- To understand General & Speciality Hospital
- To know services offered by the speciality Hospital
- To understand pros and cons of speciality Hospital
- To know common terms of Healthcare Management

Structure:

2.1 INTRODUCTION:

A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment.

Hospital is an organization of public health. It is an institution which takes care of the health and diseases of people with the help of sophisticated equipment and instruments,

by a group of specially trained persons. As many people think hospital is not only a place where sick people are taken care off; it also looks after the health or wellbeing of the people and maintains it. It tries to keep them in good health and disease free by undertaking immunization, educational program and by teaching personal and social hygienic practices.

2.2 About General Hospital: A general hospital is a hospital in which patients with many different types of ailments are given care.

The best-known type of hospital is the general hospital, which typically has an emergency department to treat urgent health problems ranging from fire and accident victims to a heart attack. A district hospital typically is the major health care facility in its region, with large numbers of beds for intensive care and additional beds for patients who need long-term care.

According to the Standards, General hospitals must provide the following services:

- Organization and general services
- Nursing services
- Pharmaceutical services
- Radiological services
- Laboratory services
- Food and dietetic services
- Medical record services
- Quality assessment and improvement
- Physical environment

- Infection control and respiratory care services

2.3 Services of General Hospital

General Hospitals may provide the following additional services:

- Surgical services
- Anaesthesia services
- Nuclear medicine services
- Outpatient services
- Rehabilitation services
- Psychiatric services
- Obstetrical and new-born services
- Paediatric services and emergency services

2.4 Pros and Cons of a General Hospital:

Pros-

• You can get all your queries solved under a roof

• Treatments in general hospitals may be less expensive than in specialized hospitals

• Due to their big size, they usually have more beds than the specialized hospitals

Cons–

• Their sheer size itself is a big issue, especially when it comes to hygiene, quality of services provided and maintenance

• There may be less of a personalized care, since there are a variety of patients with a variety of ailments under one roof

2.5 About Special Hospital

Special Hospital: A specialty hospital is a hospital that specializes in the treatment of particular illnesses or patients. Specialised hospitals include trauma centres, rehabilitation hospitals, children's hospitals, seniors' (geriatric) hospitals, and hospitals for dealing with specific medical needs such as psychiatric treatment and certain disease categories (example infectious diseases or cancers). Specialised hospitals can help reduce health care costs compared to general hospitals. Advocates of specialty hospitals argue that focusing care and treatment on a single specialty or limited number of specialties results in higher quality of care and efficiency in operations, and physicians have greater control over scheduling than they do in a full-service hospital. Surgical specialty hospitals cite lower rates of infection. Some anecdotal evidence suggests that the efficiencies lower costs.

2.6 Patients at specialty hospitals have access to

1. Extraordinary expertise
2. Resources and therapy programs that aren't often available at general hospitals.
3. Specialty hospitals often have years of experience treating individuals with special issues.
4. These dedicated facilities have special patient and family support programs.
5. Staff at specialty hospitals know how to help families navigate complex care issues at an emotionally challenging time
6. Specialty hospitals offer better outcomes

2.7 Advantages of Special hospitals:

- Improved functional independence
- Reduced medical complications
- Relevant education and resources
- Improved productivity
- Lower long-term costs
- Better preparation and support for a successful future
- Because specialty hospitals put together a custom team of physicians, therapists and caregivers, every patient's plan is designed with unprecedented expertise

Benefits of Choosing speciality Hospital

1. High-quality staff with focused experience
2. Peer support from patients with similar injuries
3. Specialized patient and family education and resources
4. More options to participate in research
5. Access to services not found in most rehabilitation centers
6. Specialized long-term support

2.8 Pros and cons of a specialized hospital:

Pros

• Critics suggest that specialized hospitals can draw large volumes, thereby reducing costs and improving the quality of the services provided to you.

• Specialized hospitals may increase their standards of quality, thereby encouraging the general hospitals to improve their quality standards too as a result of competition.
• Specialized hospitals are seen to deliver better amenities for its patients and also achieve a higher percentage of patient satisfaction.
• Specialized hospitals also put greater management responsibilities on the doctors that help to improve quality as well as productivity.

Cons

• Specialized hospitals may tend to prefer well-insured patients, while neglecting uninsured patients.
• Specialized hospitals tend to threaten the capability of the general hospitals to cross subsidize services or patients that are less-profitable.
• Specialized hospitals may not be able to manage critical emergency situations all the time since the particular physician may not be present on site all the time.
• The ownership structure of the specialization hospitals may encourage physicians to self-refer to over utilize hospital services.

2.9 Effect of specialised hospitals on general hospitals:

Studies have found out that competition from the specialized hospitals have affected the financial well-being of the general hospitals through competition for doctors and staff members, efficiency in providing emergency services etc. Critics review that the specialty hospitals are responsible for drawing more-profitable and less-complicated patients with private insurance away from the general hospitals. This threatens the ability of the general hospitals to cross-subsidize services that are less profitable and provide uncompensated care.

2.10 Clinical Terms; Common Terms of Healthcare Management

The charts providers uses for making notes are often filled with this kind of medical terminology. You might even know some of them by a different name.

1. Abrasion : A cut or scrape that typically isn't serious.
2. Abscess : A tender, fluid-filled pocket that forms in tissue, usually due to infection.
3. Acute : Signifies a condition that begins abruptly and is sometimes severe, but the duration is short.
4. Benign` : Not cancerous.
5. Biopsy : A small sample of tissue that's taken for testing.
6. Chronic : Signifies a recurring, persistent condition like heart disease.
7. Contusion : A bruise.
8. Defibrillator: A medical device that uses electric shocks to restore normal heartbeat.
9. Edema : Swelling caused by fluid accumulation.
10. Embolism : An arterial blockage, often caused by a blood clot.
11. Epidermis: The outer layer of the skin.
12. Fracture : Broken bone or cartilage.
13. Gland : An organ or tissue that produces and secretes fluids that serve a specific function.
14. Hypertension: High blood pressure.
15. Inpatient : A patient who requires hospitalization.
16. Intravenous: Indicates medication or fluid that's delivered by vein.

17. Malignant: Indicates the presence of cancerous cells.
18. Outpatient : A patient who receives care without being admitted to a hospital.
19. Prognosis : The predicated outcome of disease progression and treatment.
20. Relapse : Return of disease or symptoms after a patient has recovered.
21. Sutures : Stitches, which are used to join tissues together as they heal.
22. Transplant : The removal of an organ or tissue from one body that is implanted into another.
23. Vaccine : A substance that stimulates antibody production to provide immunity against disease.
24. Zoonotic disease : A disease that is transmissible from animals to humans.
25. **Cardi/o** : Related to the heart.
26. Derm/a/o, dermat/o : Pertaining to the skin.
27. Encephal/o : Related to the brain.
28. Gastr/o : Related to the stomach.
29. Hemat/o : Pertaining to blood.
30. My/o : Related to muscle.
31. Oste/o : Related to bone.
32. Pulmon/o : Refers to the lungs.
33. Rhin/o : Related to the nose.
34. Sclerosis : Hard or hardening.
35. Stasis : Slowing or stopping the flow of a bodily fluid.
36. Therm/o : Indicates heat
37.**ALS** : Advanced life support.
38. Bl wk : Blood work.
39. BMI : Body mass index, a measure of body fat based on height and weight.
40. BP : Blood pressure.
41. CPR : Cardiopulmonary resuscitation, a life-saving technique that's also called mouth-to-mouth resuscitation.
42. C-spine : Cervical spine.
43. DNR : Do not resuscitate, a medical order indicating providers should not perform CPR.
44. ED/ER : Emergency department or emergency room.
45. EKG : Electrocardiogram, a way of monitoring the heart and testing for problems.
46. HDL-C : High-density lipoprotein cholesterol, often called "good" cholesterol.
47. HR : Heart rate, expressed as beats per minute.
48. LDL-C : Low-density lipoprotein cholesterol, often called "bad" cholesterol.
49. Lytes : Electrolytes.
50. NICU : Neonatal intensive care unit, a specialized unit that cares for premature infants.
51. OR : Operating room where surgeries are performed.
52. Pre-op : Preoperative.
53. Psych : Refers to psychiatry or the psychiatric ward.
54. PT : Physical therapy, a type of treatment to help patients move and feel better.
55. Rx : Prescription, usually for medication but can also signify

another treatment.

56. Stat : Immediately.

2.11 Terms related to levels of healthcare, Primary, Secondary and Tertiary;

Health system: A health system, also sometimes referred to as health care system or healthcare system is the organization of people, institutions, and resources to deliver health care services to meet the health needs of target populations.

Healthcare is the maintenance or improvement of health via the diagnosis, treatment, and prevention of disease, illness, injury, and other physical and mental impairments in human beings. Healthcare is delivered by health professionals (providers or practitioners) in allied health professions, chiropractic, physicians, physician associates, dentistry, midwifery, nursing, medicine, optometry, pharmacy, psychology, and other health professions. It includes the work done in providing primary care, secondary care, and tertiary care, as well as in public health.

Access to health care may vary across countries, groups, and individuals, largely influenced by social and economic conditions as well as the health policies in place. Countries and jurisdictions have different policies and plans in relation to the personal and population-based health care goals within their societies.

Healthcare systems are organisations established to meet the health needs of target populations. Their exact configuration varies between national and sub national entities. In some countries and jurisdictions, health care planning is distributed among market participants, whereas in others, planning occurs morecentrally among governments or other coordinating bodies. In all cases,

According to the World Health Organization (WHO), a well-functioning healthcare system requires

- a robust financing mechanism
- a well-trained and adequately paid workforce
- reliable information on which to base decisions and policies
- well maintained health facilities
- logistics to deliver quality medicines and technologies

Healthcare can contribute to a significant part of a country's economy. Health care is conventionally regarded as an important determinant in promoting the general physical and mental health and well-being of people around the world. An example of this was the worldwide eradication of smallpox in 1980, declared by the WHO as the first disease in human history to be completely eliminated by deliberate health care interventions.

2.12 Health Care Delivery:

The delivery of modern health care depends on groups of trained professionals and paraprofessionals coming together as interdisciplinary teams. This includes professionals in medicine, psychology, physiotherapy, nursing, dentistry, midwifery and allied health, plus many others such as public health practitioners, community health workers and assistive personnel, who systematically provide personal and population-based preventive, curative and rehabilitative care services.

While the definitions of the various types of health care vary depending on the different cultural, political, organizational and disciplinary perspectives, there appears to be some consensus that primary care constitutes the first element of a continuing health care process, that may also include the provision of secondary and tertiary levels of care. Healthcare can be defined as either public or private.

Primary care: Primary care refers to the work of health professionals who act as a first point of consultation for all patients within the health care system. Such a professional would usually be a primary care physician, such as:

- a general practitioner or family physician,
- a licensed independent practitioner such as a physiotherapist, or
- a non-physician primary care provider (mid-level provider) such as a physician assistant or nurse practitioner.

Depending on the locality, health system organization, and sometimes at the patient's discretion, they may see another health care professional first, such as a pharmacist, a nurse (such as in the United Kingdom), a clinical officer (such as in parts of Africa), or an Ayurvedic or other traditional medicine professional (such as in parts of Asia). Depending on the nature of the health condition, patients may then be referred for secondary or tertiary care.

Primary care is often used as the term for the health care services which play a role in the local community. It can be provided in different settings, such as Urgent care centres which provide services to patients same day with the appointment or walk-in basis.

Primary care involves the widest scope of health care, including all ages of patients, patients of all socioeconomic and geographic origins, patients seeking to maintain optimal health, and patients with all manner of acute and chronic physical, mental and social health issues, including multiple chronic diseases. Consequently, a primary care practitioner must possess a wide breadth of knowledge in many areas.

Continuity is a key characteristic of primary care, as patients usually prefer to consult the same practitioner for routine check-ups and preventive care, health education, and every time they require an initial consultation about a new health problem. The International Classification of Primary Care (ICPC) is a standardised tool for understanding and analysing information on interventions in primary care by the reason for the patient visit. Common chronic illnesses usually treated in primary care may include, for example: hypertension, diabetes, asthma, COPD, depression and anxiety, back pain, arthritis or thyroid dysfunction. Primary care also includes many basic maternal and child health care services, such as family planning services and vaccinations.

In context of global population aging, with increasing numbers of older adults at greater risk of chronic non-communicable diseases, rapidly increasing demand for primary care services is expected in both developed and developing countries. The World Health Organization attributes the provision of essential primary care as an integral component of an inclusive primary health care strategy.

Secondary care: Secondary care includes acute care: necessary treatment for a short period of time for a brief but serious illness, injury or other health condition, such as in a hospital emergency department. It also includes skilled attendance during childbirth, intensive care, and medical imaging services.

The term "secondary care" is sometimes used synonymously with "hospital care". However, many secondary care providers do not necessarily work in hospitals, such as psychiatrists, psychologists, occupational, most dental specialties or physiotherapists (physiotherapists are also primary care providers, and a referral is not required to see a physiotherapist), and some primary care services are delivered within hospitals. Depending on the organization and policies of the national health system, patients may be required to see a primary care provider for a referral before they can access secondary care.

Allied health professionals, such as physical therapists, respiratory therapists, occupational therapists, speech therapists, and dietitians, also generally work in secondary care, accessed through either patient self-referral or through physician referral.

Tertiary care:

Tertiary care is specialized consultative health care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital. Examples of tertiary care services are cancer management, neurosurgery, cardiac surgery, plastic surgery, treatment for severe burns, advanced neonatology services, palliative, and other complex medical and surgical interventions.

Quaternary care:

The term quaternary care is sometimes used as an extension of tertiary care in reference to advanced levels of medicine which are highly specialised and not widely accessed. Experimental medicine and some types of uncommon diagnostic or surgical procedures are considered quaternary care. These services are usually only offered in a limited number of regional or national health care centres.

Home and community care

Many types of health care interventions are delivered outside of health facilities. They include many interventions of public health interest, such as food safety surveillance, distribution of condoms and needle-exchange programmes for the prevention of transmissible diseases.

They also include the services of professionals in residential and community settings in support of self-care, home care, long-term care, assisted living, treatment for substance use disorders and other types of health and social care services.

Community rehabilitation services can assist with mobility and independence after loss of limbs or loss of function. This can include prosthesis, orthotics or wheelchairs.

Many countries, especially in the west are dealing with aging populations, and one of the priorities of the health care system is to help seniors live full, independent lives in the comfort of their own homes. There is an entire section of health care geared to providing seniors with help in day-to-day activities at home, transporting them to doctor's appointments, and many other activities that are so essential for their health and well-being.

With obesity in children rapidly becoming a major concern, health services often set up programs in schools aimed at educating children in good eating habits; making physical education compulsory in school; and teaching young adolescents to have positive self-image.

2.13 Ratings:

Health care ratings are ratings or evaluations of health care used to evaluate the process of care, healthcare structures and/or outcomes of health care services. This information is translated into report cards that are generated by quality organizations, non-profit, consumer groups and media. This evaluation of quality can be based on:

- Measures of Hospital quality
- Measures of Health Plan Quality
- Measures of Physician Quality
- Measures of Quality for Other Health Professionals
- Measures of Patient Experience
- Related sectors

Health care extends beyond the delivery of services to patients, encompassing many related sectors, and set within a bigger picture of financing and governance structures.

2.14 Health care industry:

The health care industry incorporates several sectors that are dedicated to providing health care services and products. It generally consists of hospital activities, medical and dental practice activities, and "other human health activities". The last class involves activities of nurses, midwives, physiotherapists, scientific or diagnostic laboratories, pathology clinics, residential health facilities, patient advocates, or other allied health professions, e.g. in the field of optometry, hydrotherapy, medical massage, yoga therapy, music therapy, occupational therapy, speech therapy, chiropody, homeopathy, chiropractics, acupuncture, etc.

In addition, according to industry and market classifications, health care includes many categories of medical equipment, instruments and services as well as biotechnology, diagnostic laboratories and substances, and drug manufacturing and delivery.

2.15 SUMMARY

A general hospital is a hospital in which patients with many different types of ailments are given care. The best-known type of hospital is the general hospital, which typically has an emergency department to treat urgent health problems ranging from fire and accident victims to a heart attack. A district hospital typically is the major health care facility in its region, with large numbers of beds for intensive care and additional beds for patients who need long-term care. A **medical specialty** is a branch of medical practice that is focused on a defined group of patients, diseases, skills, or philosophy. Ex: children (paediatrics), cancer (oncology), laboratory medicine (pathology), or primary care (family medicine). After completing MBBS, doctors usually further their medical education in a specific specialty of medicine or surgery by completing a three year post graduate course to become a specialist.

2.16 KEY WORDS

General Hospital: A general hospital is a hospital in which patients with many different types of ailments are given care

Speciality Hospital: A special hospital is a hospital that specializes in the treatment of particular illnesses or patients. Specialised hospitals include trauma centres, rehabilitation hospitals, children's hospitals, seniors' (geriatric) hospitals, and hospitals for dealing with specific medical needs such as psychiatric treatment and certain disease categories

Ratings: Health care ratings are ratings or evaluations of health care used to evaluate the process of care, healthcare structures and/or outcomes of health care services

2.17 Self-Assessment Questions

1. Explain the functions of super speciality Hospital
2. Describe the terms related to Healthcare Management
3. Explain the pros and cons of super speciality Hospital
4. Describe the services available at super speciality Hospital

2.18 SUGGESTED FOR FURTHER READINGS:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-3
SYSTEMS OF MEDICINE

OBJECTIVES:

- To understand Indian system of medicine
- To study Ayurveda system of Medicine
- To understand Unani system of medicine
- To understand Homeopathy and Naturopathy medicine
- To understand Reiki medicine

Structure:

3.1 Introduction to AYUSH:

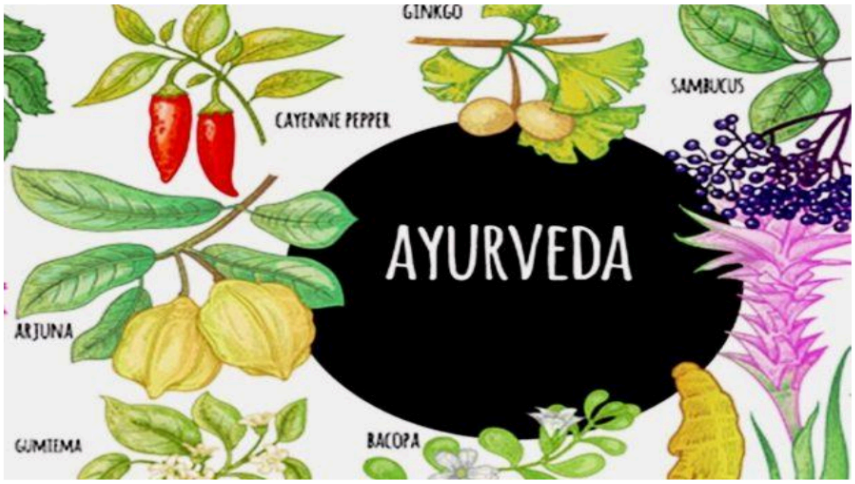
India has a rich, centuries old heritage of medical and health knowledge. Various traditional systems of health care have been in use and even today these are being extensively used. The Department of AYUSH deals with these traditional and alternate systems of medicine namely Ayurveda, Unani and Homoeopathy.

3.2 OBJECTIVES OF THE DEPARTMENT

1) To provide Medicare facilities to the people of the State through Ayurvedic, Unani and Homoeopathy systems of medicine.
2) To impart quality education at Graduation and Post-Graduation level though the Medical Colleges of Ayurvedic, Unani and Homoeopathy systems of medicine to produce qualified medical practitioners in these systems of medicines
3) To manufacture quality Ayurvedic, Homoeopathy and Unani Medicines through the Government Pharmacies and make them available on free of cost to the patients coming for treatment to Hospitals and Dispensaries being run by the Department under these (3) systems of medicine.
4) To regulate the manufacture and sale of Ayurvedic, Unani and Homoeopathy drugs in accordance with law.
5) To monitor the quality of Ayurvedic, Unani and Homoeopathy Drugs being manufactured or sold in the state.
6) To maintain the State register of Medical Practitioners in Ayurveda, Unani and Homoeopathy

3.3 AYURVEDA SYSTEM OF MEDICINE:

Ayurveda originated in India long back in pre-vedic period. Rigveda and Atharvaveda (5000 years B.C) have references on health and diseases. The Ayurveda texts like Charaka Samhita and Sushurutha Samhita were documented about 1000 years B.C. The term Ayurveda means 'science of life'. It deals elaborately with measures for healthful living during the entire span of life. Besides dealing with principles for maintenance of health it also has developed a wide range of therapeutic measures to combat illness. Thus Ayurveda becomes one of the oldest systems of healthcare dealing both the preventive and curative aspects of life in a most comprehensive way. WHO's concept of health propounded in the modern era bears a close similarity to the concept of health in Ayurveda.



3.4 Ayurveda

(Sanskrit: "the knowledge for long life") or **Ayurvedic medicine** is a Hindu system of traditional medicine native to India and a form of alternative medicine. The earliest literature on Indian medical practice appeared during the Vedic period in India, i.e., in the mid-second millennium BCE. The Susrutha Samhita and the Charaka Samhita encyclopedias of medicine compiled from various sources from the mid-first millennium BC to about 500 CE, are among the foundational works of Ayurveda. Over the following centuries, ayurvedic practitioners developed a number of medicinal preparations and surgical procedures for the treatment of various ailments. Current practices derived (or reportedly derived) from Ayurvedic medicine is regarded as part of complementary and alternative medicine.

3.4.1 Physics of Five Elements

Physics of the "five elements" that compose the universe, including the human body adopted by Ayurveda:

1. Prithvi (earth),
2. Jala (water),
3. Agni (fire),
4. Vāyu (air) and
5. Ākāśa **(Sky))**

3.4.2 Seven primary constituent elements – saptadhātu of the body

1. ***Chyle or plasma (called rasa dhātu),***
2. ***blood (rakta dhātu),***
3. ***flesh (māṃsa dhātu),***
4. ***fat (medha dhātu),***
5. ***bone (asthi dhātu),***
6. ***marrow (majja dhātu),***
7. ***and semen or female reproductive tissue (śukra dhātu)***

***3.4.3 Tridosa Theory*:** Ayurveda stresses a balance of three elemental energies or humors:

- Vayu (air & space – "wind")
- *pitta* (fire & water – "bile")
- *kapha* (water & earth – "phlegm")

According to ayurvedic medical theory, these three substances — dosas —are important for health, because when they exist in equal quantities, the body will be healthy, and when they are not in equal amounts, the body will be unhealthy in various ways.

One ayurvedic theory asserts that each human possesses a unique combination of *dosas* that define that person's temperament and characteristics. Another view, also present in the ancient literature, asserts that humoral equality is identical to health, and that persons with preponderances of humours are proportionately unhealthy, and that this is not their natural temperament.

While surgery and surgical instruments were employed from a very early period, Ayurvedic theory asserts that building a healthy metabolic system, attaining good digestion, and proper excretion lead to vitality. Ayurveda also focuses on exercise, yoga, and meditation.

The practice of *panchakarma* is a therapeutic way of eliminating toxic elements from the body.

As early as the Mahabharata, ayurveda was called "the science of eight components" a classification that became canonical for ayurveda. They are:

1. Internal medicine (*Kaya chikitsa*)
2. Paediatrics (*Kaumārabhtyam*)
3. Surgery (*Śalya-cikitsā*)
4. Eye and ENT (Śālākya tantra)
5. *Bhūta vidyā* has been called psychiatry.
6. Toxicology (*Agadatantram*)
7. Prevention of diseases and improving immunity and rejuvenation (*rasayana*)
8. Aphrodisiacs and improving health of progeny (*Vajikaranam*)

In Hindu mythology, the origin of ayurvedic medicine is attributed to Dhanvantari, the physician of the gods.

3.5 Safety concerns of Ayurveda:

- Two U.S. studies found that about 20% of Ayurveda treatments contained toxic levels of heavy metals such as lead, mercury and arsenic.

- Other concerns include the use of herbs containing toxic compounds
- The lack of quality control in Ayurvedic facilities

3.6 AYURVEDA COLLEGES:

There are (3) Ayurveda Colleges. These colleges are offering 5 ½ years BAMS course. There are teaching Hospitals attached to each College.

1. Dr.B.R.K.R.Govt. Ayurvedic College, Erragadda, Hyderabad
2. Dr. N.R.S. Govt. Ayurvedic College, Vijayawada
3. A.L.Govt. Ayurvedic College, Warangal

3.7 MINI AYURVEDIC HOSPITALS:

3.8

Besides the teaching hospitals, there are mini-hospitals located at Toopran in Medak District with (9) beds, Banaganapally in Kurnool District with (10) beds and Allur in Nellore District with (5) beds. Thus in all teaching and non-teaching Ayurvedic Hospitals (364) beds are available.

3.9 AYURVEDA PHARMACY:

3.10

There is a Government Ayurveda Pharmacy at Kattedan in Hyderabad. This Pharmacy is purchasing raw material and herbs and converting them into Ayurvedic medicines for supply to all the Ayurvedic Hospitals and Dispensaries

3.9 AYURVEDA DISPENSARIES:

There are (557) Ayurvedic Dispensaries in the State. These are mostly located in rural and interior areas. Usually the staffing pattern of a Dispensary includes (1) Medical Officer, (1) Compounder and (1) Class-IV employee.

3.10 UNANI SYSTEM OF MEDICINE

The Unani system of medicine, as its name indicates, was first developed in Greece. The Arabs and Persians introduced this system of medicine in India sometime around the 11th century. Today, India is one of the leading countries in so far as the practice of Unani medicine is concerned. It has the largest number of Unani education, research and health care institutions. This is also an herbal-based medicine system. **Unani-tibb** or **Unani Medicine**; *Yūnānī* in Arabic, Hindi-Urdu and Persian) means "Greek Medicine", and is a form of traditional medicine widely practiced in South Asia. It refers to a tradition of Graeco-Arabic medicine, which is based on the teachings of Greek physician Hippocrates, and Roman physician Galen, and developed into an elaborate medical System by Arab and Persian physicians, such as Rhazes, Avicenna (Ibn Sena), Al-Zahrawi, and Ibn Nafis.

Unani medicine is based on the concept of the four humors:

1. Phlegm (Balgham),
2. Blood (Dam),
3. Yellow bile (Ṣafrā') and
4. Black bile (Saudā').

Unani medicine first arrived in India around 12-13 century CE with establishment of Delhi Sultanate (1206-1527 CE) and Muslim rule over North India and subsequently flourished under Mughal Empire. Alauddin Khilji (r. 1296-1316) had several eminent Unani physicians (Hakims) in his royal courts. In the coming year this royal patronage meant development of Unani practice in India, but also of Unani literature with the aid of Indian Ayurvedic physicians.

3.11 UNANI COLLEGES:

There is one Unani Medical College, Govt. Nizamia Tibbi College, Hyderabad with a attached teaching Hospitals, offering a 5 ½ year BUMS course with intake capacity of 75 students. It is also offering P.G in specialties with intake capacity of 36 students.

3.12 MINI UNANI HOSPITALS:

There are (4) mini Unani Hospitals functioning at Hanmakonda, Nizamabad, Kurnool and Adoni (Kurnool Dist.) with bed strength of 5, 5, 10 and 10 respectively.

3.13 UNANI PHARMACY:

One Government Pharmacy for making Unani medicines is located at Kattedan. This Pharmacy is meeting the total requirement for supply of Unani medicines to all Unani Hospitals and Dispensaries.

3.14 UNANI DISPENSARIES: There are (196) Unani Dispensaries throughout the State.

3.15 SIDDHA MEDICINE

The **Siddha Medicine** is one of the oldest medical systems known to mankind. This system of medicine originated from south India in Tamil Nadu, as part of the trio Indian medicines - ayurveda, Siddha and unani. This system was very popular in ancient India. Believed to be more than 10,000 years old, the Siddha system of medicine is considered to be one of the most antiquated traditional medical systems.

Siddhars are the great scientists of ancient days. Siddhars were spiritual adepts who possessed the ashta siddhis, or the eight supernatural powers. Sage Agathiyar is considered the guru of all Sidhars, and the Siddha system is believed to have been handed over to him by Lord Muruga, son of the Hindu God - Lord Shiva and Goddess Parvathi. So, are the siddhars the followers of Lord Shiva (Shaivaites). *Agathiyar* is the first Siddhar, and his disciples and other siddhars of other schools contributed thousands of texts on Siddha, including medicine, and form the propounders of the system in this world.

The word Siddha comes from the word Siddhi which means an object to be attained perfection or heavenly bliss. Siddha focused to "Ashtamahasiddhi "that is the eight supernatural powers. Those who attained or achieved the above said powers are known as Siddhars. There were 18 important siddhars in olden days and they developed this system of medicine. Hence, it is called Siddha Medicine. The Siddhars wrote their knowledge in palm leaf manuscripts, fragments of which were found in different parts of South India. It is believed that some families may possess more fragments, but keep them solely for their own use. There is a huge collection of Siddha Manuscripts kept by Traditional Siddha Families.

3.16 HOMOEOPATHY SYSTEM OF MEDICINE:

Homoeopathy as a distinct system of medicine is of recent origin. Homeopathy from the Greek homoios "like" + pathos "suffering") is a form of alternative medicine originated by Samuel Hahnemann (1755–1843), based on the idea that a substance that causes the symptoms of a disease in healthy people will cure that disease in sick people. This axiom is known as "the law of similars" or "like cures like". Scientific research has found homeopathic remedies ineffective and their postulated mechanisms of action implausible. Within the medical community, homeopathy is generally considered quackery.

Its founder believed that human beings have a capacity for healing themselves and that the symptoms of the disease reflect the individuals struggle to overcome his illness.

Homoeopathy simply means treating diseases with remedies, usually prescribed in minute doses, which are capable of producing symptoms similar to the disease when taken by healthy people. Homoeopathy is a rapidly growing system. In India it is recognized as one of the National systems of medicine. Due to its low cost and low side effects, it is becoming very popular day by day and has a great potential to provide health care to the large number of poor population.

3.17 HOMOEOPATHY COLLEGES:

There are (4) Homoeopathy colleges offering 5 ½ years BHMS course and the College at Hyderabad is also offering a P.G programme in (3) specialties. The following are the details of student intake and bed strength in the attached teaching hospitals of these colleges:

1. J.S.P.S Govt. Homoeo. Medical College,Ramanthapur, Hyderabad
2. Dr.Gururaju Govt. Homoeo Medical College, Gudivada, Krishna District
3. Govt. Homoeo. Medical College, Kadapa
4. Dr. Allu Ramalingaiah Govt. Homoeo. Medical College, Rajahmundry

3.18 HOMOEOPATHY MINI HOSPITALS:

Government Homoeopathy Hospital, Motigally, Hyderabad with (20) beds. Government Homoeopathy Hospital, Bhongir, Nalgonda Dist with (10) beds.

3.19 HOMOEOPATHY PHARMACY:

One modern Homoeopathy Pharmacy in Government sector is established in the campus of Govt. Homoeopathy Hospital, Ramanthapur, and Hyderabad. This Pharmacy is purchasing raw material and manufacturing Homoeopathy medicines for supply to all Homoeopathy Hospitals and Dispensaries.

3.20 HOMOEOPATHY DISPENSARIES:

There are (286) Homoeopathy Dispensaries in the State. These Dispensaries are also located in rural areas spread in all Districts. The staffing pattern is same with (1) Medical Officer, (1) Compounder and (1) class-IV employee.

All these systems of medicine in the state are under the administrative control of Department of AYUSH. This Department is headed by a Commissioner with (3) Additional Directors (Ayurveda, Unani & Homoeopathy) to assist the Commissioner in technical matters. Besides, (6) Regional Deputy Directors are stationed at the following places:

1. Visakhapatnam
2. Eluru
3. Ongole
4. Kadapa
5. Warangal
6. Hyderabad

3.21 NATUROPATHY

Naturopathic medicine is a form of pseudoscientific, alternative medicine that employs an array of practices branded as "natural", "non-invasive", and as promoting "self-healing". The ideology and methods of naturopathy are based on vitalism and folk medicine, rather than evidence-based medicine. Naturopathic practitioners generally recommend against modern medical practices, including but not limited to medical testing, drugs, vaccinations, and surgery. Instead, naturopathic study and practice rely on unscientific notions, often leading naturopathic doctors to diagnoses and treatments that have no factual merit.

Naturopathic medicine is considered by the medical profession to be ineffective and possibly harmful, raising ethical issues about its practice. In addition to accusations from the medical community, such as the American Cancer Society, naturopaths and naturopathic doctors have repeatedly been accused of being charlatans and practicing quackery. Over the years, many practitioners of naturopathic medicine have been found criminally liable in the courts of law around the world. In some countries it is a criminal offense for naturopaths and naturopathic doctors to label themselves as medical professionals.

Naturopathic practice is based on a belief in the body's ability to heal itself through a special vital energy or force guiding bodily processes internally. Diagnosis and treatment concern primarily alternative and "natural" methods that naturopaths claim promote the body's natural ability to heal. Naturopaths focus on a holistic approach, often completely avoiding the use of surgery and drugs. Naturopaths aim to prevent illness through stress reduction and changes to diet and lifestyle, often rejecting the methods of evidence-based medicine.

A consultation typically begins with a lengthy patient interview focusing on lifestyle, medical history, emotional tone, and physical features, as well as physical examination. Many naturopaths present themselves as primary care providers, and some naturopathic physicians may prescribe drugs, perform minor surgery, and integrate other conventional medical approaches such as diet and lifestyle counselling with their naturopathic practice. Traditional naturopaths deal exclusively with lifestyle changes, not diagnosing or treating disease. Naturopaths do not generally recommend vaccines and antibiotics, based in part on the early views that shaped the profession, and they may provide alternative remedies even in cases where evidence-based medicine has been shown effective.

The particular modalities used by a naturopath vary with training and scope of practice. These may include herbalism, homeopathy, acupuncture, nature cures, physical medicine, applied kinesiology, colonic enemas, chelation therapy, color therapy, cranial osteopathy, hair analysis, iridology, live blood analysis, ozone therapy, psychotherapy, public health measures and hygiene, reflexology, rolfing, massage therapy, and traditional Chinese medicine. Nature cures include a range of therapies based on exposure to natural elements such as sunshine, fresh air, or heat or cold, as well as nutrition advice such as following a vegetarian and whole food diet, fasting, or abstention from alcohol and sugar. Physical medicine includes naturopathic, osseous, or soft tissue manipulative therapy, sports medicine, exercise, and hydrotherapy. Psychological counseling includes meditation, relaxation, and other methods of stress management.

Naturopaths represent a diverse group of practitioners. In general, they can be categorized into three groups:

1. those with a government issued license;
2. those who practice outside of an official status ("traditional naturopaths");
3. those who are primarily another kind of health professional who also practices naturopathy.

3.22 YOGA

Yoga is a group of physical, mental, and spiritual practices or disciplines which originated in ancient India. There is a broad variety of yoga schools, practices, and goals in Hinduism, Buddhism, and Jainism. Among the most well-known types of yoga are Hatha yoga and Rāja yoga.

The origins of yoga have been speculated to date back to pre-Vedic Indian traditions; it is mentioned in the Rigveda, but most likely developed around the sixth and fifth centuries BCE, in ancient India's ascetic and śramaṇa movements. The chronology of earliest texts describing yoga-practices is unclear, varyingly credited to Hindu Upanishads. The Yoga Sutras of Patanjali date from the first half of the 1st millennium CE, but only gained prominence in the West in the 20th century. Hatha yoga texts emerged around the 11th century with origins in tantra.

Yoga gurus from India later introduced yoga to the west, following the success of Swami Vivekananda in the late 19th and early 20th century. In the 1980s, yoga became popular as a system of physical exercise across the Western world. Yoga in Indian traditions, however, is more than physical exercise; it has a meditative and spiritual core. One of the six major orthodox schools of Hinduism is also called Yoga, which has its own epistemology and metaphysics, and is closely related to Hindu Samkhya philosophy.

Many studies have tried to determine the effectiveness of yoga as a complementary intervention for cancer, schizophrenia, asthma, and heart disease. The results of these studies have been mixed and inconclusive, with cancer studies suggesting none to unclear effectiveness, and others suggesting yoga may reduce risk factors and aid in a patient's psychological healing process. On December 1, 2016, yoga was listed by UNESCO as an Intangible cultural heritage.

Yoga has five principal meanings:

1) Yoga, as a disciplined method for attaining a goal;
2) Yoga, as techniques of controlling the body and the mind;
3) Yoga, as a name of one of the schools or systems of philosophy (darśana);
4) Yoga, in connection with other words, such as "hatha-, mantra-, and laya-," referring to traditions specializing in particular techniques of yoga;

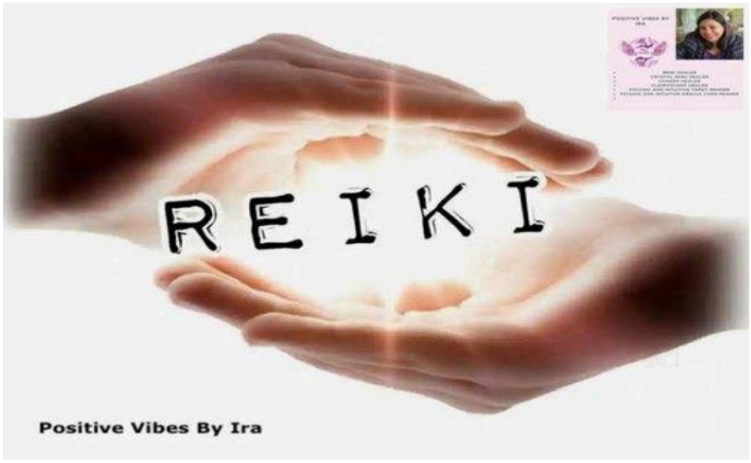
1) Yoga, as the goal of Yoga practice."

Yoga has been studied and is increasingly recommended to promote relaxation, reduce stress and some medical conditions such as premenstrual syndrome in Europe as well as in the United States. According to Dupler and Frey, Yoga is a low-impact activity that can provide the same benefits as "any well-designed exercise program, increasing general health and stamina, reducing stress, and improving those conditions brought about by sedentary lifestyles". It is particularly suited, add Dupler and Frey, as a physical therapy routine, and as a regimen to strengthen and balance all parts of the body. Yoga has also been used as a complete exercise program and physical therapy routine.

3.23 REIKI

Reiki is a form of alternative medicine developed in 1922 by Japanese Buddhist Mikao Usui. Since originating in Japan, Reiki has been adapted into varying cultural traditions across the world. Reiki practitioners use a technique called palm healing or hands-on healing through which a "universal energy" is allegedly transferred through the palms of the practitioner to the patient in order to encourage emotional or physical healing.

Reiki is pseudoscience. It is based on qi ("chi"), which practitioners say is a universal life force, although there is no empirical evidence that such a life force exists. Clinical research has not shown Reiki to be effective as a medical treatment for any medical condition. The American Cancer Society, Cancer Research UK, and the National Center for Complementary and Integrative Health state that Reiki should not be a replacement for conventional treatment.



Reiki's teachings and adherents claim that qi is physiological and can be manipulated to treat a disease or condition. The existence of qi has not been established by medical research. Therefore, Reiki is a pseudoscientific theory based on metaphysical concepts.

The existence of the proposed mechanism for Reiki–qi or "life force" energy– has not been established. Most research on Reiki is poorly designed and prone to bias. There is no

reliable empirical evidence that Reiki is helpful for treating any medical condition, although some physicians have said it might help promote general well-being.

3.24 National Rural Health Mission

Recognizing the importance of Health in the process of economic and social development and improving the quality of life of our citizens, the Government of India has resolved to launch the National Rural Health Mission (N.R.H.M) to carry out necessary architectural correction in the basic health care delivery system. The Mission adopts a synergistic approach by relating health to determinants of good health viz. segments of nutrition, sanitation, hygiene and safe drinking water. It also aims at mainstreaming the Indian systems of medicine to facilitate health care. The Plan of Action includes increasing public expenditure on health, reducing regional imbalance in health infrastructure, pooling resources, integration of organizational structures, optimization of health manpower, decentralization and district management of health programmes, community participation and ownership of assets, induction of management and financial personnel into district health system, and operationalizing community health centers into functional hospitals meeting Indian Public Health Standards in each Block of the Country.

The Goal of the Mission is to improve the availability of and access to quality health care by people, especially for those residing in rural areas, the poor, women and children. In A.P. state, it is proposed to provide AYUSH Facilities in all the PHCs and CHCs in a phased manner over a period of 3 years i.e., by 2010. Every year AYUSH facilities are being established in PHCs.

3.25 Summary: India has a rich, centuries old heritage of medical and health knowledge. Various traditional systems of health care have been in use and even today these are being extensively used. The Department of AYUSH deals with these traditional and alternate systems of medicine namely Ayurveda, Unani and Homoeopathy, Yoga and Reiki.

3.26 Key Words: Ayurveda, Siddha Homeopathy Naturopathy

Ayurveda The term Ayurveda means 'science of life'. It deals elaborately with measures for healthful living during the entire span of life. **Ayurvedic medicine** is a Hindu system of traditional medicine native to India and a form of alternative medicine

Siddha: The word Siddha comes from the word Siddhi which means an object to be attained perfection or heavenly bliss. Siddha focused to "Ashtamahasiddhi "that is the eight supernatural powers

Homeopathy: Homoeopathy simply means treating diseases with remedies, usually prescribed in minute doses, which are capable of producing symptoms similar to the disease when taken by healthy people.

Naturopathy: Naturopathic medicine is a form of pseudoscientific, alternative medicine that employs an array of practices branded as "natural", "non-invasive", and as promoting "self-healing.

3.27 Self-Assessment Questions

1) Discuss the merits and demerits of Ayurveda and Naturopathy
2) Explain the Unani and Homeopathy services in India?
3) Explain safety concern of Ayurveda
4) Write in detail about Reiki.

3.28 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-4

OUTPATIENT & INPATIENT SERVICES

OBJECTIVES:

- To understand outpatient and inpatient services
- To know the objectives of outpatient services
- To know speciality wise medical terminology
- Understand the dental services and emergency services

Structure

4.1 INTRODUCTION:

A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. The main services of hospital include inpatient services outpatient services and other services including paediatric, dental, psychiatric services etc.

4.2 Outpatient Medical services:

Outpatient services are medical procedures or tests that can be done in a medical center without an overnight stay. Many procedures and tests can be done in a few hours. Most people can choose an outpatient center instead of a hospital if the needed service is available. But not all medical procedures can or should be done at an outpatient center.

4.3 Definition:

An outpatient department or outpatient clinic is the part of a hospital designed for the treatment of outpatients, people with health problems who visit the hospital for diagnosis or treatment, but do not at this time require a bed or to be admitted for overnight care.

The outpatient department is an important part of the overall running of the hospital. It is normally integrated with the in-patient services and manned by consultant physicians and surgeons who also attend inpatients in the wards. Many patients are examined and given treatment as outpatients before being admitted to the hospital at a later date as inpatients. When discharged, they may attend the outpatient clinic for follow-up treatment.

The outpatient department will usually be on the ground floor of the hospital with car parking facilities nearby. Wheelchairs and stretchers are available for non-ambulatory patients. Patients will register at a reception desk and there is seating for them while they wait for their appointments. Each doctor will have a consulting room and there may be smaller waiting areas near these. Paediatric clinics are often held in areas separated from the adult clinics. Close at hand will be X-ray facilities, laboratories, the medical record office and a pharmacy. In the main waiting area there are a range of facilities for the patients and their families including toilets, public telephones, coffee shop or snack bar, water dispenser, gift shop, florist and quiet room. In many countries, hospitals do not have separate outpatient departments, so outpatients are treated in the same departments as patients that stay overnight.

4.4 Objectives of outpatient services:

- ✓ To provide adequate quality of care
- ✓ All modern techniques for investigation and treatment
- ✓ Creating facilities for total patient satisfaction
- ✓ Good public relations

4.5 Outpatient services include:

- ➢ Wellness and prevention, such as counselling and weight-loss programs.
- ➢ Diagnosis, such as lab tests and MRI scans.
- ➢ Treatment, such as some surgeries and chemotherapy.
- ➢ Rehabilitation, such as drug or alcohol rehab and physical therapy.

4.6 Services Provided by the OPD:

OPDs provide all general services and facilities which are necessary for any hospital. OPDs act as the first step for consulting the doctor and getting the tests done to proceed with treatment. Through the services provided in OPD, the hospital works for the smooth functioning of the healthcare system. These services are classified as –

- **Prevention and wellness -** : OPDs provide guidance to the patients for overall wellness and prevention of health issues. Doctors guide patients to maintain a healthy weight, improve sleep, balance sugar levels, etc.
- **Diagnosis -**: OPD is the first place where the patient and doctor meet and discuss the patient's health condition. After discussing the issue, the doctor suggests the necessary tests for the patient. The lab tests and MRI scans are conducted in the OPD.
- **Treatment -**: Treatment and minor surgeries can be done in the outpatient department. Modern OPD has all the necessary equipment to treat a patient. Surgeries such as cuts, wounds, etc., can be easily handled in the modern OPD.

4.7 Points to consider while visiting an OPD

It is important to know some points before visiting any hospital's OPD. These points will save your time and will make the treatment more convenient to access.

- **OPD Timings**: The timing of OPD in any hospital depends on the hospital itself. It varies from place to place and for every hospital. However, India's most common OPD timings are 9 A.M. to 6 P.M. This is the best time to book your appointment and immediately get one.
- **OPD Slots**: Specific slots are also provided in some hospitals. Generally, it is according to the availability of the doctor. Some specialists visit only during the specific time slots. However, the common consulting doctor is always available for the patient.
- **Booking an appointment in the OPD**: Suppose, you want to consult a specialist then you have to book an appointment with them through call or online. However, you can even ask the receptionist to book an appointment according to its severity and health condition.
- **Searching for the appropriate specialist**: It is a difficult job to search for a specialist for your treatment. In such a case, consult a general doctor who will recommend a specialist if required.

4.8 Importance of OPD in Healthcare Systems

- An Outpatient Department is at the entrance of any hospital. It acts as the first place where the patients and doctors communicate.
- It is a crucial link between the patients and the healthcare system and is hence inseparable.
- It is vital in preventing diseases and ensures fast recovery of the patient.
- It controls the number of patients in the inpatient ward by providing small surgeries and treatments.
- It evaluates the patients, and only those who require a bed or special care are shifted to the inpatient ward. Thus, saving the number of occupied beds.
- Generally, people that visit for the first time and have minor health are treated in OPD. Doctors conduct tests, provide consultancy, and give prescriptions to the patient in the OPD.

4.9 Benefits of outpatient services

- Outpatient services usually cost less, because one does not need to stay overnight.
- Staff members at outpatient centers are well trained in the service they provide.
- Most of the time, these centers specialize in one kind of treatment or procedure.
- Often all the care one needs can be provided in one place.
- OP Care is more accessible to a greater number of health consumers
- Receiving care outside of hospital walls reduces the risk of acquiring hospital based infections
- OP care will improve the overall efficient flow of patients through the system as fewer admissions or shorter hospital stays will reduce delays in necessary admissions, and result in fewer outpatient clinic referrals
- OP care alleviates pressure on hospital space and facilities

Many medical investigations and treatments for acute illness and preventive health care can be performed on an ambulatory basis, including minor surgical and medical procedures, most types of dental services, dermatology services, and many types of diagnostic procedures (e.g. blood tests, X-rays, endoscopy and biopsy procedures of superficial organs). Other types of

ambulatory care services include emergency visits, rehabilitation visits, and in some cases telephone consultations.

4.10 Inpatient Medical services:

An inpatient department or IPD is a unit of a hospital or a healthcare facility where patients are admitted for medical conditions that require appropriate care and attention. An Inpatient Department of the hospital is equipped with beds, medical equipments, round the clock availability of doctors and nurses

4.11 Inpatient Services Includes

❖ **Hospital wards**. Patients are assigned a ward or a room based on the type of care they need and the availability of the bed. ... Hospital wards Patients are assigned a ward or a room based on the type of care they need and the availability of the bed. Typically, each general ward houses eight cubicles and each cubicle provides hospital bed to six patients. When patients request a private room we make every effort to meet their request. We have 20 private rooms. All private rooms have a phone, attached toilet, a closet for personal belongings and a bedside control for contacting a member of the staff.

❖ **Hospital Team.** When admitted to the hospital, patient care is provided by a team of health care professionals trained to meet patient's specific medical needs. The hospital team comprises of 20 units : Medicine (4); Surgery (3); Dermatology (1) ; Psychiatry (1); Paediatrics (2); Obstetrics and Gynaecology (3); Orthopaedics (2); Ophthalmology (2); ENT (1); A professor heads the unit; an associate professor, lecturers, registrars and interns form the team.

❖ **Surgery**. The departments of Surgery, Orthopaedics, Obstetrics and Gynaecology, Ophthalmology and Ear-Nose-Throat offer surgical services to both inpatients. The well-equipped operation theatre complex should be located at a convenient place.

4.12 Inpatient Bracelet:

During the time spent in admitting, a plastic bracelet will be placed on the person's wrist with their name, age, date of birth, room number, and medical record number on it. A separate bracelet is added that lists allergies.

Once all the admitting information has been completed, the next step is usually being taken to one's room. Once taken to a room, the nurse taking care of the patient will go over the medical and medication history, and

Orienting the person to the room:

- how to adjust bed height,
- how to use the nurse call button,
- show where the bathroom is located, and
- explain how to use the bedside telephone and television
- The side rails of the bed may be put up, to prevent falling out of bed if the person is not thinking clearly, perhaps because of some medication they are receiving

The nurse will review the doctor's orders, such as what tests have been scheduled, whether or not they can get out of bed for the bathroom or to walk around the unit, what medications they will be getting, and whether or not there are restrictions on what they can eat.

The hospital will supply towels, sheets, and blankets, but some people like to bring something personal with them from home. Because of the risk of infections being transferred from one patient to another, one may prefer to leave things at home. If one does choose to bring in something personal, it should be washed with warm or hot water and soap to make sure that germs are not brought home from the hospital.

Sometimes when people are admitted to the hospital they need extremely close observation that can only be given in specialized care called an intensive care unit . Because of the severity of their condition, visiting hours are more restricted than in the regular rooms. It may be that only one or two people can visit at a time, and only for a few minutes at a time. Once the person's condition improves, they may then be transferred to a room with a less rigid visitation policy. If an individual has a surgical procedure performed, they will spend a few hours in a recovery area. This is to make sure that the person's condition is stable before returning to the regular room. Visiting is limited in the recovery area, and the person may spend most of the time sleeping, as the effects of the surgical anesthesia wear off.
If the person entering the hospital is a child, the parents or guardian will fill out the hospital forms. Most hospitals allow parents and guardians to stay overnight in the hospital with the child, and to be with them 24 hours a day. Many hospitals have special areas for children to play in, and even areas in which they do not have anything done to them which is painful, so they can completely relax.

4.13 Specialty-wise terminology:

A **medical specialty** is a branch of medical practice that is focused on a defined group of patients, diseases, skills, or philosophy. Ex: children (paediatrics), cancer (oncology), laboratory medicine (pathology), or primary care (family medicine). After completing MBBS, doctors usually further their medical education in a specific specialty of medicine or surgery by completing a three year post graduate course to become a specialist.
Medical specialties can be classified along several axes. These are:

- Surgical or Internal medicine
- Age range of patients (Paediatric, geriatric etc)
- Diagnostic or therapeutic
- Organ-based or technique-based (Nephrology, Cardiology etc)

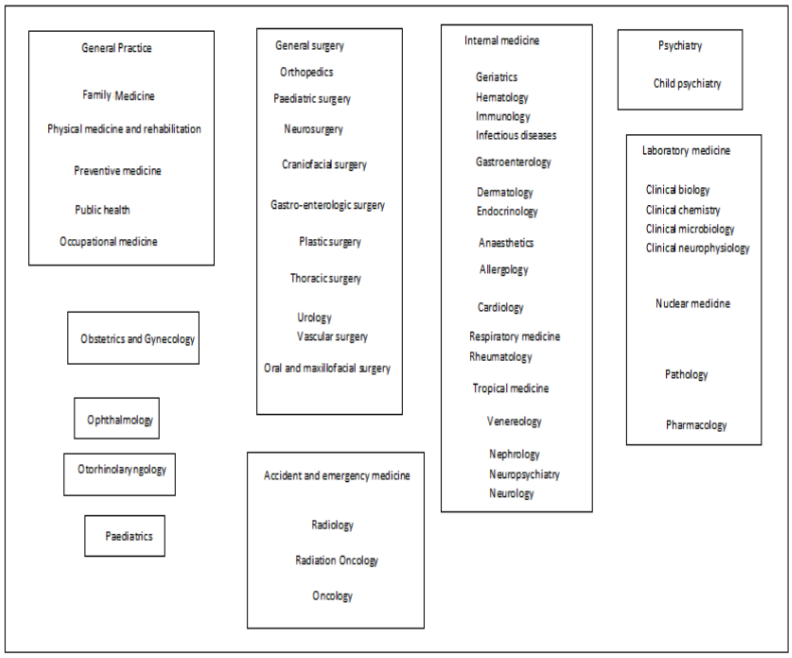
The **surgical specialties** are those in which an important part of diagnosis and treatment is achieved through major surgical techniques.

The **internal medicine specialties** are the specialties in which the main diagnosis and treatment is never major surgery. Though Anaesthesiology is vital in the surgical process, anaesthesiologists never perform major surgery themselves.

Many specialties are **organ-based**. Many symptoms and diseases come from a particular organ. Others are based mainly around a **set of techniques**, such as radiology, which was originally based around X-rays.

The **age range of patients** seen by any given specialist can be quite variable. Paediatricians handle most complaints and diseases in children that do not require surgery, and there are several subspecialties (formally or informally) in paediatrics that mimic the organ-based specialties in adults. Paediatric surgery may or may not be a separate specialty that handles some kinds of surgical complaints in children.

A further subdivision is **the diagnostic versus therapeutic specialties**. While the diagnostic process is of great importance in all specialties, some specialists perform mainly or only diagnostic examinations, such as pathology, clinical neurophysiology, and radiology. This line is becoming somewhat blurred with interventional radiology, an evolving field that uses image expertise to perform minimally invasive procedures.
List of specialities:



4.14 Clinical laboratory sciences

- Transfusion medicine is concerned with the transfusion of blood and blood component, including the maintenance of a "blood bank".
- Cellular pathology is concerned with diagnosis using samples from patients taken as tissues and cells using histology and cytology.
- Clinical chemistry is concerned with diagnosis by making biochemical analysis of blood, body fluids, and tissues.
- Haematology is concerned with diagnosis by looking at changes in the cellular composition of the blood and bone marrow as well as the coagulation system in the blood.
- Clinical microbiology is concerned with the *in vitro* diagnosis of diseases caused by bacteria, viruses, fungi, and parasites.
- Clinical immunology is concerned with disorders of the immune system and related body defenses. It also deals with diagnosis of allergy.

4.15 PEDIATRICS

It is the branch of medicine that involves the medical care of infants, children, and adolescents. A medical practitioner who specializes in this area is known as a **pediatrician**, or **paediatrician**. The word *pediatrics* mean "healer of children"; they derive from two Greek words :(*pais* "child") and (*iatros*" doctor, healer"). Paediatricians work both in hospitals, particularly those working in its subspecialties such as neonatology, and as primary care physicians.

Paediatricians are doctors who look at specific health issues, diseases and disorders related to stages of growth and development. This is an area of medicine where the doctor works closely with the patient and their family. Paediatrics is a diverse, stimulating and hugely rewarding specialty. A paediatrician can work in:

- General paediatric units seeing a wide range of conditions affecting children
- Community-based settings managing long-term care of children and young people
- Highly specialised units working in a wide range of sub-specialties such as neonatal medicine

Paediatrics is a broad-based specialty which allows doctors to be generalists and see children and young people with a wide range of illnesses and disease or to become very specialised in certain areas.

4.16 Differences between adult and paediatric medicine

- The smaller body of an infant or neonate is substantially different physiologically from that of an adult.
- Congenital defects, genetic variance, and developmental issues are of greater concern to pediatricians than they often are to adult physicians. A common adage is that children are not simply "little adults". The clinician must take into account the immature physiology of the infant or child when considering symptoms, prescribing medications, and diagnosing illnesses.
- A major difference between the practice of pediatric and adult medicine is that children, in most jurisdictions cannot make decisions for themselves. The issues of guardianship, privacy, legal responsibility and informed consent must always be considered in every pediatric procedure.

- Pediatricians often have to treat the parents and sometimes, the family, rather than just the child.
- Adolescents are in their own legal class, having rights to their own health care decisions in certain circumstances. The concept of legal consent combined with the non-legal consent (assent) of the child when considering treatment options, especially in the face of conditions with poor prognosis or complicated and painful procedures/surgeries, means the pediatrician must take in to account the desires of many people, in addition to those of the patient.

4.17 Subspecialties of pediatrics include:

- Adolescent medicine
- Child abuse pediatrics
- Clinical informatics
- Developmental-behavioral pediatrics
- Electrophysiology
- Genetics
- Headache medicine
- Hospice & palliative care
- Neonatology
- Pain medicine
- Pediatric allergy and immunology
- Pediatric cardiology
- Pediatric critical care
- Pediatric emergency medicine
- Pediatric endocrinology
- Pediatric gastroenterology
- Pediatric hematology
- Pediatric infectious disease
- Pediatric nephrology
- Pediatric neuropsychology
- Pediatric oncology
- Pediatric neuro-oncology
- Pediatric pulmonology
- Pediatric rheumatology
- Sleep medicine
- Social pediatrics
- Sports medicine
- Transplant hepatology

Other specialties that care for children include:

- Child neurology, a specialty in its own right
- Epilepsy
- Neuro critical Care
- Pediatric neuro-oncology
- Child psychiatry, subspecialty of psychiatry
- Pediatric anaesthesiology, subspecialty of anaesthesiology
- Pediatric dermatology, subspecialty of dermatology
- Pediatric neurosurgery, subspecialty of neurosurgery

- Pediatric ophthalmology, subspecialty of ophthalmology
- Pediatric orthopedic surgery, subspecialty of orthopedic surgery
- Pediatric otolaryngology, subspecialty of otolaryngology
- Pediatric rehabilitation medicine, subspecialty of physical medicine and rehabilitation
- Pediatric surgery, subspecialty of general surgery
- Pediatric urology, subspecialty of urology

4.18 Requirements of a good pediatrician

- Committed to promoting the welfare of children
- able to be patient, sensitive and empathetic
- approachable and diplomatic
- comfortable with an informal and flexible environment
- good at communicating with a wide range of people
- someone who thrives in a team situation
- fun-loving with a good sense of humor

4.19 DENTAL SERVICES

The term dentistry comes from **odontology** (from Ancient Greek odoús, "tooth") – the study of the structure, development, and abnormalities of the teeth. **Dental care** is the maintenance of healthy teeth and may refer to:

- Oral hygiene, the practice of keeping the mouth and teeth clean in order to prevent dental disorders
- Dentistry, the professional care of teeth, including professional oral hygiene and dental surgery

Dentistry is a branch of medicine that is involved in the study, diagnosis, prevention, and treatment of diseases, disorders and conditions of the oral cavity, commonly in the dentition but also the oral mucosa, and of adjacent and related structures and tissues, particularly in the maxillofacial (jaw and facial) area. Although primarily associated with teeth among the general public, the field of dentistry or dental medicine is not limited to teeth but includes other aspects of the craniofacial complex including the temper mandibular and other supporting structures.

Dentistry is important for overall health. Dental treatment is carried out by the dental team, which often consists of a dentist and dental auxiliaries (dental assistants, dental hygienists, dental technicians, and dental therapists).

The majority of dental treatments are carried out to prevent or treat the two most common oral diseases are:

- dental caries (tooth decay) and
- periodontal disease (gum disease or pyorrhea)

Common treatments involve:

- the restoration of teeth,
- extraction or surgical removal of teeth,
- scaling and root planing and
- endodontic root canal treatment

Dentists also encourage prevention of oral diseases through proper hygiene and regular, twice yearly, checkups for professional cleaning and evaluation. Conditions in the oral cavity may be indicative of systemic diseases such as osteoporosis, diabetes, or cancer. Many studies have also shown that gum disease is associated with an increased risk of diabetes, heart disease, and preterm birth. The concept that oral health can affect systemic health and disease is referred to as "oral-systemic health".

- **Dental public health**: The study of epidemiology and social health policies relevant to oral health
- **Conservative dentistry and endodontics**: The art and science of restoring the tooth form and function when destructed by carious and non carious lesions affecting the teeth, before involvement of pulp or root canal is termed as conservative dentistry. When the root canal is involved, the speciality is known as endodontics.
- **Endodontics** (also called endodontology: Root canal therapy and study of diseases of the dental pulp and periapical tissues.
- **Forensic odontology**: The gathering and use of dental evidence in law. This may be performed by any dentist with experience or training in this field. The function of the forensic dentist is primarily documentation and verification of identity.
- **Geriatric dentistry or Geriodontics:** The delivery of dental care to older adults involving the diagnosis, prevention, and treatment of problems associated with normal aging and age-related diseases as part of an interdisciplinary team with other health care professionals.

- **Oral and maxillofacial pathology:** The study, diagnosis, and sometimes the treatment of oral and maxillofacial related diseases.
- **Oral and maxillofacial radiology:** The study and radiologic interpretation of oral and maxillofacial diseases.
- **Oral and maxillofacial surgery** (also called oral surgery): Extractions, implants, and surgery of the jaws, mouth and face.
- **Oral Implantology**: The art and science of replacing extracted teeth with dental implants.
- **Oral medicine**: The clinical evaluation and diagnosis of oral mucosal diseases
- **Orthodontics and dentofacial orthopedics:** The straightening of teeth and modification of mid face and mandibular growth.
- **Pediatric dentistry (also called pedodontics)**: Dentistry for children
- **Periodontology (also called periodontics):** The study and treatment of diseases of the periodontium (non-surgical and surgical) as well as placement and maintenance of dental implants
- **Prosthodontics (also called prosthetic dentistry**): Dentures, bridges and the restoration of implants. Some prosthodontists further their training in "oral and maxillofacial prosthodontics", which is the discipline concerned with the replacement of missing facial structures, such as ears, eyes, noses, etc.
- **Special needs dentistry** (also called special care dentistry): Dentistry for those with developmental and acquired disabilities.

4.20 PSYCHIATRY

Psychiatry is the branch of medicine devoted to the diagnosis, prevention, study, and treatment of mental disorders. These include various abnormalities related to mood, behaviour, cognition, and perceptions.

The word psyche comes from the ancient Greek for soul or butterfly. The term "psychiatry" was first coined by Johann Christian Reil in 1808 and literally means the 'medical treatment of the soul'. A medical doctor specializing in psychiatry is a psychiatrist. Psychiatrists differ from psychologists in that they are physicians and have post-graduate training in psychiatry. The quality and thoroughness of their graduate medical training is identical to that of all other physicians. Psychiatrists can therefore counsel patients, prescribe medication, order laboratory tests, order neuroimaging, and conduct physical examinations.

Psychiatry refers to a field of medicine focused specifically on the mind, aiming to study, prevent, and treat mental disorders in humans. Psychiatry treats mental disorders, which are conventionally divided into three very general categories:

- Mental illnesses
- Severe learning disabilities
- Personality disorders

While the focus of psychiatry has changed little over time, the diagnostic and treatment processes have evolved dramatically. The field of psychiatry has continued to become more biological and less conceptually isolated from other medical fields.

Approaches

Psychiatric illnesses can be conceptualized in a number of different ways. The **biomedical approach** examines signs and symptoms and compares them with diagnostic criteria. Mental illness can be assessed, conversely, through a narrative which tries to incorporate symptoms into a meaningful life history and to frame them as responses to external conditions.

Initial psychiatric assessment of a person typically begins with a case history and mental status examination. Physical examinations and psychological tests may be conducted. On occasion, neuroimaging or other neurophysiological techniques are used. Mental disorders are often diagnosed in accordance with criteria listed in diagnostic manuals such as the widely used Diagnostic and Statistical Manual of Mental Disorders (DSM), published by the American Psychiatric Association (APA), and the International Classification of Diseases (ICD), edited and used by the World Health Organization (WHO).

The combined treatment of psychiatric medication and psychotherapy has become the most common mode of psychiatric treatment in current practice. Treatment may be delivered on an inpatient or outpatient basis, depending on the severity of functional impairment or on other aspects of the disorder in question.

4.21 Psychiatrist

All physicians can diagnose mental disorders and prescribe treatments utilizing principles of psychiatry. Psychiatrists are physicians who specialize in psychiatry and are certified to treat mental illness. They may treat outpatients, inpatients, or both; they may practice as solo practitioners or as members of groups; they may be self-employed, be members of partnerships, or be employees of governmental, academic, non-profit, or for-profit entities; they may treat military personnel as civilians or as members of the military; and in any of these settings they may function as clinicians, researchers, teachers, or some combination of these. Although psychiatrists may also go through significant training to conduct psychotherapy, psychoanalysis or cognitive behavioral therapy, it is their training as physicians that differentiates them from other mental health professionals.

The field of psychiatry has many subspecialties the following include:

- Clinical neurophysiology
- Forensic psychiatry
- Addiction psychiatry

- Child and Adolescent Psychiatry
- Geriatric psychiatry
- Hospice and palliative medicine
- Pain management
- Psychosomatic medicine
- Sleep medicine

1. **Addiction psychiatry:** It focuses on evaluation and treatment of individuals with alcohol, drug, or other substance-related disorders, and of individuals with dual diagnosis of substance-related and other psychiatric disorders.
2. **Child and adolescent psychiatry:** the branch of psychiatry that specializes in work with children, teenagers, and their families.
3. **Emergency psychiatry:** the clinical application of psychiatry in emergency settings.
4. **Forensic psychiatry:** the interface between law and psychiatry.
5. **Geriatric psychiatry:** a branch of psychiatry dealing with the study, prevention, and treatment of mental disorders in humans with old age.
6. **Neuropsychiatry:** branch of medicine dealing with mental disorders attributable to diseases of the nervous system.
7. **Social psychiatry:** a branch of psychiatry that focuses on the interpersonal and cultural context of mental disorder and mental well-being.

Persons who undergo a psychiatric assessment are evaluated by a psychiatrist for their mental and physical condition. This usually involves interviewing the person and often obtaining information from other sources such as other health and social care professionals, relatives, associates, law enforcement personnel, emergency medical personnel, and psychiatric rating scales. A mental status examination is carried out, and a physical examination is usually performed to establish or exclude other illnesses that may be contributing to the alleged psychiatric problems.

4.22 EMERGENCY SERVICES

The Department of Emergency is the face of the hospital and also one of its main pillars . It provides round the clock services which include any acute illness and cases which the patients and their relatives consider them to be attended immediately.

An emergency department (ED), also known as an accident & emergency department (A&E), emergency room (ER) or **casualty department**, is a medical treatment facility specializing in emergency medicine, the acute care of patients who present without prior appointment; either by their own means or by that of an ambulance. The emergency department is usually found in a hospital.

Due to the unplanned nature of patient attendance, the department must provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life-threatening and require immediate attention. In some countries, emergency departments have become important entry points for those without other means of access to medical care.
The emergency departments of most hospitals operate 24 hours a day, although staffing levels may be varied in an attempt to reflect patient volume.

4.23 Definition of Emergency medicine

According to the American College of Emergency Physicians (ACEP), an emergency is commonly defined as any condition perceived by the prudent layperson, or someone on his or her behalf, as requiring immediate medical or surgical evaluation and treatment. The practice of emergency medicine has the primary mission of evaluating, managing and providing treatment to these patients with unexpected injury or illness.

According to the curriculum of the College of Emergency Medicine (CEM) United Kingdom, Emergency medicine is a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of the acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioural disorders. It is a specialty in which time is critical

Location: A typical hospital has its emergency department in its own section of the ground floor of the grounds, with its own dedicated entrance.

Triage: As patients can present at any time and with any complaint, a key part of the operation of an emergency department is the prioritization of cases based on clinical need. This process is called triage. Triage is normally the first stage the patient passes through, and consists of a brief assessment, including a set of vital signs, and the assignment of a "chief complaint" (e.g. chest pain, abdominal pain, difficulty breathing, etc.). Most emergency departments have a dedicated area for this process to take place, and may have staff dedicated to performing nothing but a triage role.

Most patients will be initially assessed at triage and then passed to another area of the department, or another area of the hospital, with their waiting time determined by their clinical need. However, some patients may complete their treatment at the triage stage, for instance if the condition is very minor and can be treated quickly, if only advice is required, or if the emergency department is not a suitable point of care for the patient. Conversely, patients with evidently serious conditions, such as cardiac arrest, will bypass triage altogether and move straight to the appropriate part of the department.


TRIAGE
Brief clinical assessment that determines the sequence in which patient should be seen in Emergency Department
Priority 1
Life threatening emergencies
For example:
Cardiac arrest
Continuous seizures
Acute chest pain
Severe breathing difficulty
Patient not responding to calls
Hematemesis
Acute stroke
Major trauma
Hypotension BP less than 90 systolic
Patient with altered sensorium
Heart rate more than 150 or less than 45/ min
Respiratory rate less than 8 or more than 24
Severe pain (7 or more in scale of 1-10)
Acute limb weakness or inability to walk
Emergency physician must examine this patient immediately
Priority 2
Potentially life or limb threatening Emergencies
For example:
Acute febrile illness
Severe Gastritis
Acute Gastroenteritis
Mild to moderate pain (Pain scale less than 7)
Minor head injury
Isolated bone fracture
Persistent vomiting
Abdominal pain
Swelling over limb
Cellulitis
Lacerations
Joint dislocations
Vertigo
The patient needs full evaluation and treatment by a Emergency physician within 10 min of arrival
Priority 3
Non life threatening emergencies
For example:
Chronic minor and self limiting disorders
Mild adult upper resiratory tract infections
Common cold
Backache
Minor skin disorders
Follow up patients
Planned admissions etc
Emergency Physician should attend these patients only after stabilizing priority 1 and 2 patient , preferably within 45 min of arrival of a patient

4.24 TRIAGE

- **Purpose**: Purpose is to ensure that sickest should be seen first among the patient visiting to emergency department.
- **Scope**: Accident and Emergency Department
- **Responsibility**: Triage Nurse, Emergency physician on duty
- **Definition**: Triage is used to identify patient's level of urgency and treat them based on their triage level. The global advancement of triage scales in the past two decades has generated considerable research on the validity and reliability of these scales.

The main purpose of triage in ED is to prioritize incoming patients and to identify those who cannot wait to be seen. Over triage uses scarce resources, limiting availability of an ED bed for another patient who may require immediate care

The resuscitation area: It is commonly referred to as "Trauma" or "Resus", is a key area in most departments. The most seriously ill or injured patients will be dealt with in this area, as it contains the equipment and staff required for dealing with immediately life-threatening illnesses and injuries.

Seriously ill patients: Patients who exhibit signs of being seriously ill but are not in immediate danger of life or limb will be triaged to "acute care" or "majors," where they will be seen by a physician and receive a more thorough assessment and treatment. Examples of "majors" include chest pain, difficulty breathing, abdominal pain and neurological complaints. Advanced diagnostic testing may be conducted at this stage, including laboratory testing of blood and/or urine, ultrasonography, CT or MRI scanning. Medications appropriate to manage the patient's condition will also be given. Depending on underlying causes of the patient's chief complaint, he or she may be discharged home from this area or admitted to the hospital for further treatment.

Patients whose condition is not immediately life-threatening will be sent to an area suitable to deal with them, and these areas might typically be termed as a prompt care or minors area. Such patients may still have been found to have significant problems, including fractures, dislocations, and lacerations requiring suturing.

Children can present particular challenges in treatment. Some departments have dedicated pediatrics areas, and some departments employ a play therapist whose job is to put children at ease to reduce the anxiety caused by visiting the emergency department, as well as provide distraction therapy for simple procedures.

Many hospitals have a separate area for evaluation of psychiatric problems. These are often staffed by psychiatrists and mental health nurses and social workers. There is typically at least one room for people who are actively a risk to themselves or others (e.g. suicidal).

Fast decisions on life-and-death cases are critical in hospital emergency rooms. As a result, doctors face great pressures to over test and over treat. The fear of missing something often leads to extra blood tests and imaging scans for what may be harmless chest pains, run-of-the-mill head bumps, and non-threatening stomach aches, with a high cost on the Health Care system.

4.25 Critical conditions handled

Cardiac arrest: Cardiac arrest may occur in the ED/A&E or a patient may be transported by ambulance to the emergency department already in this state. Treatment is basic life support and advanced life support as taught in advanced life support and advanced cardiac life support courses. This is an immediately life-threatening condition which requires immediate action in salvageable cases.

Heart attack: Patients arriving to the emergency department with a myocardial infarction (heart attack) are likely to be triaged to the resuscitation area. They will receive oxygen and monitoring and have an early ECG;
An ECG that reveals ST segment elevation or new left bundle branch block suggests complete blockage of one of the main coronary arteries. These patients require immediate reperfusion (re-opening) of the occluded vessel by thrombolysis (clot-busting medication) or Percutaneous Transluminal Coronary Angioplasty (PTCA). This may involve transfer to a nearby facility with facilities for angioplasty.

Trauma: Major trauma, the term for patients with multiple injuries, often from a road traffic accident or a major fall, is initially handled in the Emergency Department. The services that are provided in an emergency department can range from x-rays and the setting of broken bones to those of a full-scale trauma centre. A patient's chance of survival is greatly improved if the patient receives definitive treatment (i.e. surgery or reperfusion) within one hour of an accident (such as a car accident) or onset of acute illness (such as a heart attack). This critical time frame is commonly known as the "golden hour".

Mental illness: Some patients arrive at an emergency department for a complaint of mental illness. In many jurisdictions (including many US states), patients who appear to be mentally ill and to present a danger to themselves or others may be brought against their will to an emergency department by law enforcement officers for psychiatric examination. The emergency department conducts medical clearance rather than treats acute behavioral disorders. From the emergency department, patients with significant mental illness may be transferred to a psychiatric unit (in many cases involuntarily).

Asthma and COPD: Acute exacerbations of chronic respiratory diseases, mainly asthma and chronic obstructive pulmonary disease (COPD), are assessed as emergencies and treated with oxygen therapy, bronchodilators, steroids or theophylline, have an urgent chest X-ray and arterial blood gases and are referred for intensive care if necessary. Noninvasive ventilation in the ED has reduced the requirement for tracheal intubation in many cases of severe exacerbations of COPD.

4.26 Special facilities, training, and equipment:

An ED requires different equipment and different approaches than most other hospital divisions. Patients frequently arrive with unstable conditions, and so must be treated quickly. They may be unconscious, and information such as their medical history, allergies, and blood type may be unavailable. ED staff are trained to work quickly and effectively even with minimal information.
Cardiac arrest and major trauma are relatively common in EDs, so defibrillators, automatic ventilation and CPR machines, and bleeding control dressings are used heavily. Survival in such cases is greatly enhanced by shortening the wait for key interventions. Because time is such an essential factor in emergency treatment, EDs typically have their own diagnostic equipment to avoid waiting for equipment installed elsewhere in the hospital.
Overcrowding: Emergency department overcrowding is when function of a department is hindered by an inability to treat all patients in an adequate manner. This is a common occurrence in emergency departments worldwide. Overcrowding causes inadequate patient care which leads to poorer patient outcomes.
Emergency department waiting times: Various studies reported significant associations between waiting times and higher mortality and morbidity among those who survived. It is

clear from the literature that untimely hospital deaths and morbidity can be reduced by reductions in ED waiting times.

Casualty: According to Dictionary A person or thing who is hurt or killed during an accident, war and harmed, lost or destroyed or badly affected by event or situation. The word casualty has been used since 1844 in civilian life

4.27 Summary A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. The main services of hospital include inpatient services outpatient services and other services including paediatric, dental, psychiatric services etc. An inpatient department or IPD is a unit of a hospital or a healthcare facility where patients are admitted for medical conditions that require appropriate care and attention. An Inpatient Department of the hospital is equipped with beds, medical equipments, round the clock availability of doctors and nurses. Hospital includes different kind of specialities including Paediatrics, Dental service, Psychiatric services; Casualty & Emergency services.

4.28 Key Words: Hospital, Out Patient Medical Services, OPD, IPD, Psychiatry

Hospital: A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment.

Out Patient Medical Services: Outpatient services are medical procedures or tests that can be done in a medical center without an overnight stay.

OPD: An outpatient department or outpatient clinic is the part of a hospital designed for the treatment of outpatients, people with health problems who visit the hospital for diagnosis or treatment, but do not at this time require a bed or to be admitted for overnight care.

IPD: An inpatient department or IPD is a unit of a hospital or a healthcare facility where patients are admitted for medical conditions that require appropriate care and attention

Psychiatry: Psychiatry is the branch of medicine devoted to the diagnosis, prevention, study, and treatment of mental disorders. These include various abnormalities related to mood, behaviour, cognition, and perceptions

4.29 Self-Assessment Questions

1) Write short notes on the following:
   Pediatric services in hospital
   About Triage
2) Explain Emergency services available in Hospitals?
3) Explain the OPD and IP services in Hospital

4.30 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-5

HOSPITAL SERVICES

OBJECTIVE:

- To understand Hospital services
- To know functional components of Laboratory services
- To understand Anaesthesia services
- To know the Obstetrics and Gynaecology
- To understand neurology

Structure:

5.1 HOSPITAL LABORATORY SERVICES:

The laboratory as you know exists for the sole purpose of providing diagnostic and management information for the physicians to aid in the patient care, The ultimate goal of laboratory is to attend to the ailing patients, carry out the investigations asked and prompt issue of accurate results for favour of diagnosis and treatment.

The clinician uses the laboratory to get assistance in diagnosis and management of the patient. In fact, a test requisition is a request for consultative services which sets in motion a vast array of activities to generate a laboratory report. Usefulness of the data in making to generate a result consists of series of steps, or processes. An adequate understanding of clinical judgements depends upon prompt, accurate reporting of the result. Each procedure each process enables the laboratorian to achieve more nearly optimal conditions and, consequently, to improve the accuracy and precision of each measurement. Collection, handling and processing the specimen prior to analysis must receive prime consideration. Validity of data obtained on the specimen itself is highly dependent upon the excellence of laboratory technique, including proper manipulation of equipment, use of reagents of specified purity.

5.2 Functional Components

The Functional components of a clinical laboratory are:

i) Histopathology
ii) Clinical Pathology
iii) Microbiology
iv) Haematology
v) Biochemistry
vi) Research laboratories

There are further subdivisions of each of the above components related to sub or super specialisation. However, these are not enumerated here. Only the functional laboratories in routine day to day diagnostic work are summarised.

5.2.1 **Histopathology**

Laboratory performing organ, tissues, cell examination for the diagnosis of various types of abnormalities /diseases is called as Histopathology Laboratory. Examinations of tissues/organs are from living/dead body, in the form of either surgical specimen; biopsy or autopsy.

5.2.2. Clinical Pathology

This is the branch of pathology in which all body fluids such as blood, urine, sputum, stool, pleural, peritoneal fluid are examined for physical, chemical, bacteriological and microscopic examination for normal or abnormal contents.

5.2.3 Microbiology:

This is the science which deals with study of microbes such as bacteria, viruses, parasites etc. The study involves the identification, morphological and cultural studies, serology and sensitivity of organisms responsible for causing the disease or commonly found as commensals.

5.2.4 Haematology:

Branch of laboratory Medicine in which the study of blood and blood components is done for detection of various abnormalities in normal and ill health.

5.2.5 Chemical Pathology (Biochemistry):

Science which determines and measures various chemical substances in normal and abnormal amounts produced during disease process. The study includes examination of

various groups of clinical substances, hormones, enzymes, isoenzyme, vitamin and metabolites etc.

5.2.6 Clinical Research Laboratories

Are those laboratories which den1 with research related to patient care system or services, research related to development of techniques, methods and applications, therapeutic trials of drugs, reagents, kits, equipment development and animal experimentations. Research and development is an integral part of patient care services and such laboratories are designed for research and academic purpose.

5.3 ANAESTHESIA SERVICES:

Anaesthesiology is a high risk specialty. However the public at large are not aware of the risks involved in anaesthesia. Moreover, in the present system of anaesthesia practice in India, there is not much scope for interaction between the patient and the anaesthesiologist and hence there is no rapport between them. Under such circumstances, when something goes wrong, the patient or his relatives react in a hostile manner towards the anaesthesiologist and many a times they land up in a police station or court to seek Redressal.

5.3.1 Types of cases:

An anaesthesiologist can be dragged to court either in a criminal or a civil case.

In a criminal case, the aggrieved party files a complaint against the anaesthesiologist in a police station which then investigates the case and the Government prosecutes the concerned anesthesiologist. This happens only when the offense is of a serious nature. The idea of judicial proceedings in criminal cases is to punish the anesthesiologist concerned for the lapse on his part. Complainant does not get any compensation in criminal cases.

In a civil case the aggrieved party itself approaches the court to seek compensation for the harm caused by the action of the anesthesiologist. These cases can go to the common courts or to one of the consumer courts.

After introduction of Consumer Protection Act (CPA), most of the cases relating to Medical Negligence go to the consumer courts. The reasons for this are the inexpensive and simple procedure and speedy disposal of the cases in these courts

5.4 OBSTETRICS AND GYNAECOLOGY

Obstetrics and Gynecology (often abbreviated to OB/GYN, OBG, O&G or Obs & Gynae) is the medical specialty that deals with obstetrics and gynecology.

5.4.1Gynaecology

Gynaecology is the medical practice dealing with the health of the female reproductive systems (vagina, uterus, and ovaries) and the breasts. Almost all modern gynecologists are also obstetricians). In many areas, the specialities of gynecology and obstetrics overlap.

5.4.2 OBSTETRICS

Obstetrics (from the Latin obstare, "to stand by") is the health profession or medical specialty that deals with pregnancy, childbirth, and postpartum period (including care of the newborn). The midwife and the obstetrician are the professionals in obstetrics.

Prenatal care: Prenatal care is important in screening for various complications of pregnancy. This includes routine office visits with physical exams and routine lab tests:

First trimester

- Haemoglobin
- Blood type and Rh (Rh negative antenatal patients should receive RhoGam at 28 weeks to prevent Rh disease)
- Rapid Plasma Reagin (RPR) or VDRL to screen for syphilis
- Urinalysis and culture
- HIV screen

The woman's blood pressure, height and weight will also be measured, and her Body Mass Index (BMI) will be calculated. This is the only time her weight will be recorded routinely. Her family history, obstetric history, medical history and social history will also be discussed. Women usually have their first ultrasound scan at around twelve weeks. This is a trans-abdominal ultrasound. This is the scan from which the pregnancy is dated and the woman's estimated due date (or EDD) is worked out. At this scan, some hospitals offer women the opportunity to have screening for risk of the fetus for having Down's syndrome.

Second trimester:

- Ultrasound either abdominal or transvaginally to assess cervix, placenta, fluid and baby. In some countries Amniocentesis is done for women over 35 for congenital deformities of the baby.
- At around twenty weeks, the woman will have an anomaly scan. This trans-abdominal ultrasound scan checks on the anatomical development of the fetus. It is a detailed scan and checks all the major organs. At this scan, the position of the placenta is noted, to ensure it is not low.

Third trimester

- Haematocrit (if low, mother will receive iron supplementation)
- Screening for Gestational diabetes: A glucose tolerance test (GTT) is administered; a fasting glucose > 105 mg/dL suggests gestational diabetes. This includes women with a raised BMI, women of certain ethnic origins and women who have a first degree relative with diabetes.

From twenty eight weeks, the midwife will measure the Symphysis Fundal Height (or SFH) to measure the growth of the abdomen. This is currently the best method available to easily check the fetal growth, but it is not perfect. At appointments, the midwife will check the woman's blood pressure and do a urinalysis. The midwife will palpate the woman's abdomen to establish the lie, presentation and position of the fetus, and later, the engagement. The midwife will offer to listen to the fetal heart.

From the woman's due date, the midwife may offer to do a stretch and sweep. This involves a vaginal examination, where the midwife will assess the cervix and attempt to sweep the membranes. This releases a hormone called prostaglandin, which is believed to help the cervix prepare for labour.

5.5 Antenatal record:

The antenatal record constitutes a medical history and physical examination of a pregnant woman. On the first visit to her obstetrician, the medical history, personal history and family history of the pregnant woman will be recorded along with details of the first examination and lab tests. Special attention will be given to examination of breasts and nipples. On subsequent visits, the gestational age (GA) will be recorded as well as weight gain, Blood pressure, Fundal height, Fetal heart etc.

5.6 Imaging:

Ultrasound imaging may be done at any time throughout the pregnancy, but usually happens at the 12th week (dating scan) and the 20th week (detailed scan).

5.7 Complications and emergencies

- Ectopic pregnancy is when an embryo implants in the uterine (Fallopian) tube or (rarely) on the ovary or inside the peritoneal cavity. This may cause massive internal bleeding.
- Pre-eclampsia is a disease which is defined by a combination of signs and symptoms that are related to maternal hypertension. The cause is unknown. Some unknown factors cause vascular damage in the endothelium, causing hypertension. If severe, it progresses to eclampsia, where seizures occur, which can be fatal. Preeclamptic patients with the HELLP syndrome show liver failure and Disseminated intravascular coagulation (DIC). The only treatment is to deliver the fetus. Women may still develop pre-eclampsia following delivery.
- Placental abruption is where the placenta detaches from the uterus and the woman and fetus can bleed to death if not managed appropriately.
- Fetal distress where the fetus is getting compromised in the uterine environment
- Shoulder dystocia where one of the fetus' shoulders becomes stuck during vaginal birth. There are many risk factors, including large fetus.
- Uterine rupture can occur during obstructed labor and endanger fetal and maternal life.
- Prolapsed cord can only happen after the membranes have ruptured. The umbilical cord delivers before the presenting part of the fetus. If the fetus is not delivered within minutes, or the pressure taken off the cord, the fetus will die.

- Obstetrical hemorrhage may be due to a number of factors such as placenta previa, uterine rupture or tears, uterine atony, retained placenta or placental fragments, or bleeding disorders.
- Puerperal sepsis is an ascending infection of the genital tract. It may happen during or after labour. Signs to look out for include signs of infection (fever, raised heart rate and respiratory rate, reduced blood pressure), and abdominal pain, offensive lochia (blood loss) increased lochia, clots, diarrhea and vomiting.
- Intercurrent diseases; In addition to complications of pregnancy that can arise, a pregnant woman may have intercurrent diseases, that is, other diseases or conditions (not directly caused by the pregnancy) that may become worse or be a potential risk to the pregnancy.
- Diabetes mellitus and pregnancy: Risks for the child include miscarriage, growth restriction, growth acceleration, fetal obesity (macrosomia), polyhydramnios and birth defects.
- Systemic lupus erythematosus and pregnancy confers an increased rate of fetal death in utero and spontaneous abortion (miscarriage), as well as of neonatal lupus.
- Thyroid disease in pregnancy can, if uncorrected, cause adverse effects on fetal and maternal well-being.

5.8 Childbirth care – Induction:

Induction is a method of artificially or prematurely stimulating labour in a woman. Reasons to induce can include pre-eclampsia, placental malfunction, intrauterine growth retardation, and other various general medical conditions, such as renal disease. Induction may occur any time after 34 weeks of gestation if the risk to the fetus or mother is greater than the risk of delivering a premature fetus regardless of lung maturity.
Induction may be achieved via several methods:

- Pessary of Prostin cream, prostaglandin E2
- Intra-vaginal or oral administration of misoprostol
- Cervical insertion of a 30-mL Foley catheter
- Rupturing the amniotic membranes
- Intravenous infusion of synthetic oxytocin (Pitocin or Syntocinon)

Inducing labour may start with the midwife performing a stretch and sweep. This is a vaginal examination, where the midwife will assess the cervix and, if able to do so, will sweep the membranes, releasing prostaglandins which are believed to help the cervix prepare for labour, and therefore bring on labour. If this is unsuccessful, the woman may be offered induction. This usually involves a vaginal examination where the cervix is assessed and given a Bishop's Score, and the insertion of prostaglandin as a pessary. Once the cervix is favourable (and it may take more than one dose of prostaglandin) and there is space on the labour ward, the woman will be transferred to the labour ward for an Artificial rupture of membranes (ARM). Quite often, the woman will then be encouraged to mobilise in the hope that she labour naturally. This may be for a couple of hours. If nothing happens, the woman will then be commenced on an infusion of syntocinon. This is a synthetic form of the hormone oxytocin which women naturally release during labour. If any step is successful, the woman will continue to labour and not move on to the next procedure.
Labor: During labor itself, the obstetrician or midwife may be called on to do a number of tasks. These tasks can include:

- Monitor the progress of labor, by reviewing the nursing chart, performing vaginal examination, and assessing the trace produced by a fetal monitoring device (the cardiotocograph)

- Accelerate the progress of labor by infusion of the hormone oxytocin
- Provide pain relief, either by nitrous oxide, opiates, or by epidural anesthesia done by anesthetists, an anesthesiologist, or a nurse anesthetist.
- Surgically assisting labor, by forceps or the Ventouse (a suction cap applied to the fetus' head)
- Caesarean section, if there is an associated risk with vaginal delivery, as such fetal or maternal compromise supported by evidence and literature. Caesarean section can either be elective, that is, arranged before labor, or decided during labor as an alternative to hours of waiting. True "emergency" Cesarean sections include abruptio placenta, and are more common in multigravid patients, or patients attempting a Vaginal Birth after Caesarean section (VBAC).

Midwives care for women in labour and through the delivery. The midwife will constantly assess the woman and the fetus, and the progress of labour. As a minimum, in the first stage of labour, the midwife will listen to the fetal heart for one minute every fifteen minutes, measure the woman's pulse hourly and record her blood pressure and temperature four hourly. She will encourage the woman to empty her blood four hourly, and will measure and analyse each void. She will offer an abdominal palpation and vaginal examination four hourly. In the second stage of labour, the fetal heart will be ausculatated for one minute every five minutes, the pulse and blood pressure measured hourly, temperature four hourly, abdominal palpation and vaginal examination hourly and the woman will be encouraged to void frequently. Of course, these are all minimums. If the woman was on continuous fetal monitoring, the midwife would formally review this hourly. The midwife would refer to another health care practitioner if the labour deviated from the norm or if the woman requested an epidural. The midwife should discuss the woman's birth plan with her and explain the options regarding labour to the woman.

Postnatal care: Postnatal care is care provided to the mother following parturition (delivery). During this time the mother is monitored for bleeding, bowel and bladder function, and baby care. The infant's health is also monitored. Certain things must be kept in mind as the physician proceeds with the post-natal care.

- General Condition of the patient; Check for Vital Signs (Pulse, Blood Pressure, Temperature, Respiratory Rate, (Pain) at times), Pallor, Edema, Dehydration
- Fundus (height following parturition, and the feel of the fundus) (Per Abdominal Examination)
- If an Episiotomy or a C-Section was performed, check for the dressing. Intact, pus, oozing, haematomas
- Lochia (colour, amount, odour)
- Bladder (keep the patient catheterized for 12 hours following local anesthesia and 24–48 hours after general anesthesia) (check for bladder function)
- Bowel Movements
- Follow up with the neonate to check if they are healthy.

Care of the new born: At birth, the baby will be given an Apgar score at, at the least, one minute and five minutes of age. This is a score out of 10, which assesses the baby on five different areas, each worth between 0 and 2 points. These areas are: colour, respiratory effort, tone, heart rate and response to stimuli. The midwife will check the baby over for any obvious problems, and will weigh the baby and measure the head circumference. The midwife will ensure the cord has been clamped securely and the baby has the appropriate name tags on (if in hospital). Skin-to-skin contact with the mother is encouraged as this regulates the baby's heart rate, breathing, oxygen saturations and temperature, and promotes bonding and breastfeeding.

GYNAECOLOGY

The word "gynecology" comes from Greek (*gyne)*, "woman", and *-logia*, "study". It is the medical practice dealing with the health of the female reproductive systems (vagina, uterus, and ovaries).

Examination: The main tools of diagnosis are clinical history and examination. Gynaecological examination is quite intimate, more so than a routine physical exam. It also requires unique instrumentation such as the speculum. The speculum consists of two hinged blades of concave metal or plastic which are used to retract the tissues of the vagina and permit examination of the cervix, the lower part of the uterus located within the upper portion of the vagina. Gynecologists typically do a bimanual examination (one hand on the abdomen and one or two fingers in the vagina) to palpate the cervix, uterus, ovaries and bony pelvis. It is not uncommon to do a rectovaginal examination for complete evaluation of the pelvis, particularly if any suspicious masses are appreciated. Male gynecologists may have a female chaperone for their examination. An abdominal or vaginal ultrasound can be used to confirm any abnormalities appreciated with the bimanual examination or when indicated by the patient's history.

Examples of conditions dealt with by a gynecologist are:

- Cancer and pre-cancerous diseases of the reproductive organs including ovaries, fallopian tubes, uterus, cervix, vagina, and vulva
- Incontinence of urine
- Amenorrhea (absent menstrual periods)
- Dysmenorrhea (painful menstrual periods)
- Infertility
- Menorrhagia (heavy menstrual periods); a common indication for hysterectomy
- Prolapse of pelvic organs
- Infections of the vagina (vaginitis), cervix and uterus (including fungal, bacterial, viral, and protozoal)
- UTI and Pelvic Inflammatory Disease
- Premenstrual Syndrome
- Other vaginal diseases

There is some crossover in these areas. For example, a woman with urinary incontinence may be referred to a urologist.

5.9 Common Operations performed by Gynaecologist

Some of the more common operations that gynaecologists perform include:

1. Dilation and curettage (removal of the uterine contents for various reasons, including completing a partial miscarriage and diagnostic sampling for dysfunctional uterine bleeding refractive to medical therapy)
2. Hysterectomy (removal of the uterus)
3. Oophorectomy (removal of the ovaries)
4. Tubal ligation (a type of permanent sterilization)
5. Hysteroscopy (inspection of the uterine cavity)
6. Diagnostic laparoscopy – used to diagnose and treat sources of pelvic and abdominal pain; perhaps most famously used to provide a definitive diagnosis of endometriosis.
7. Exploratory laparotomy – may be used to investigate the level of progression of benign or malignant disease, or to assess and repair damage to the pelvic organs.
8. Various surgical treatments for urinary incontinence, including cystoscopy and sub-urethral slings.
9. Surgical treatment of pelvic organ prolapses, including correction of cystocele and rectocele.

10. Appendectomy –often performed to remove site of painful endometriosis implantation or prophylactically (against future acute appendicitis) at the time of hysterectomy or Caesarean section. May also be performed as part of a staging operation for ovarian cancer.
11. Cervical Excision Procedures (including cryosurgery) – removal of the surface of the cervix containing pre-cancerous cells which have been previously identified on Pap smear.

5.10 NEUROSURGERY SERVICES

Neurosurgery, or neurological surgery, is the medical specialty concerned with the prevention, diagnosis, surgical treatment, and rehabilitation of disorders which affect any portion of the nervous system including the brain, spinal cord, peripheral nerves, and extra-cranial cerebrovascular system.

General neurosurgery involves most neurosurgical conditions including Neuro-trauma and other Neuro emergencies such as intracranial haemorrhage.

Some of these divisions of neurosurgery are:

- Vascular neurosurgery and endovascular neurosurgery
- Stereotactic neurosurgery,
- Functional neurosurgery,
- Epilepsy surgery (the surgical removal of functional, physiological and/or anatomical pieces or divisions of the brain, called epileptic foci, that are operable and that are causing seizures)
- Oncological neurosurgery also called neurosurgical oncology; includes treatment of benign and malignant central and peripheral nervous system cancers and pre-cancerous lesions in adults and children.
- skull base surgery
- spinal neurosurgery
- peripheral nerve surgery
- pediatric neurosurgery(for cancer, seizures, bleeding, stroke, cognitive disorders or congenital neurological disorders)

Conditions treated by neurosurgeons include, but are not limited to:

- ✓ Meningitis and other central nervous system infections including abscesses
- ✓ Spinal disc herniation
- ✓ Cervical spinal stenosis and Lumbar spinal stenosis
- ✓ Hydrocephalus
- ✓ Head trauma (brain hemorrhages, skull fractures, etc.)
- ✓ Spinal cord trauma
- ✓ Traumatic injuries of peripheral nerves
- ✓ Tumors of the spine, spinal cord and peripheral nerves
- ✓ Intracerebral hemorrhage, such as subarachnoid hemorrhage, interdepartmental, and intracellular hemorrhages
- ✓ Some forms of drug-resistant epilepsy
- ✓ Some forms of movement disorders (advanced Parkinson's disease, chorea)– this involves the use of specially developed minimally invasive stereotactic techniques (functional, stereotactic neurosurgery) such as ablative surgery and deep brain stimulation surgery
- ✓ Intractable pain of cancer or trauma patients and cranial/peripheral nerve pain
- ✓ Some forms of intractable psychiatric disorders
- ✓ Vascular malformations of the brain and spinal cord

Neuro radiology methods: They are used in modern neurosurgery diagnosis and treatment. They include

- ❖ Computer assisted imaging computed tomography (CT),
- ❖ Magnetic resonance imaging (MRI),
- ❖ Positron emission tomography (PET),
- ❖ Magneto encephalography (MEG), and
- ❖ Stereotactic radiosurgery

5.11 NEUROLOGY

Neurology is a branch of medicine dealing with disorders of the nervous system. Neurology deals with the diagnosis and treatment of all categories of conditions and disease involving the central and peripheral nervous system (and its subdivisions, the autonomic nervous system and the somatic nervous system); including their coverings, blood vessels, and all effector tissue, such as muscle.

A neurologist is a physician specializing in neurology and trained to investigate, or diagnose and treat neurological disorders. Neurologists may also be involved in clinical research, and clinical trials, as well as basic research and translational research. While neurology is a non-surgical specialty, its corresponding surgical specialty is neurosurgery. Neurology, being a branch of medicine, differs from neuroscience, which is the scientific study of the nervous system in all of its aspects.

Scope

A large number of neurological disorders have been described. These can affect the central nervous system (brain and spinal cord), the peripheral nervous system, the autonomic nervous system and the muscular system.

Training

Neurologists are physicians having completed postgraduate training in neurology after graduation from medical school. Neurologists complete, on average, at least 10–13 years of college education and clinical training. This training includes obtaining a four-year undergraduate degree, a medical degree (M.D.), which comprises an additional four years of study, and then completing a three year residency in neurology.

Some neurologists receive additional subspecialty training focusing on a particular area of neurology. These training programs are called fellowships, and are one to two years in duration.

Sub-specialties include:

- brain injury medicine,
- clinical neurophysiology,
- epilepsy,
- hospice and palliative medicine,
- Neuro-developmental disabilities,
- neuromuscular medicine,
- pain medicine and sleep medicine,
- vascular neurology (stroke), and
- interventional neurology
- neurological rehabilitation (known as physiatry in the US) includes stroke medicine as well as brain injuries

Physical examination

During a neurological examination, the neurologist reviews the patient's health history with special attention to the current condition. The patient then takes a neurological exam. Typically, the exam tests mental status, function of the cranial nerves (including vision), strength, coordination, reflexes, and sensation. This information helps the neurologist determine whether the problem exists in the nervous system and the clinical localization. Localization of the pathology is the key process by which neurologists develop their differential diagnosis. Further tests may be needed to confirm a diagnosis and ultimately guide therapy and appropriate management.

Clinical tasks

Neurologists examine patients who have been referred to them by other physicians in both the inpatient and outpatient settings. A neurologist will begin their interaction with a patient by taking a comprehensive medical history, and then perform a physical examination focusing on evaluating the nervous system. Components of the neurological examination include:

- assessment of the patient's cognitive function
- cranial nerves
- motor strength
- sensation
- reflexes
- coordination
- gait

Commonly employed tests in neurology: Neurologists may order additional diagnostic tests as part of the evaluation. They include:

1. Imaging studies such as:
a. Computed Axial Tomography (CAT) scans
b. Magnetic Resonance Imaging (MRI)
c. Ultrasound of major blood vessels of the head and neck
2. Neurophysiologic studies, including:
a. Electro Encephalo Graphy (EEG)
b. Electro Myo Graphy (EMG)
c. Evoked Potentials
3. Lumbar Puncture: Neurologists frequently perform lumbar punctures in order to assess characteristics of a patient's cerebrospinal fluid.

Commonly encountered conditions treated by neurologists include:

- headaches,
- radiculopathy,
- neuropathy,
- stroke,
- dementia,
- seizures and epilepsy,
- Alzheimer's disease,
- Attention deficit/hyperactivity disorder,
- Parkinson's disease,
- Tourette's syndrome,
- multiple sclerosis,
- head trauma,
- sleep disorders,

- neuromuscular diseases, and
- various infections and tumors of the nervous system
- Neurologists are also asked to evaluate unresponsive patients on life support in order to confirm brain death.

Treatment options vary depending on the neurological problem. They can include everything from referring the patient to a physiotherapist, to prescribing medications, to recommending a surgical procedure.

Some neurologists specialize in certain parts of the nervous system or in specific procedures. For example, clinical neurophysiologists specialize in the use of electro diagnostic techniques (EEG and EMG) in order to diagnose certain neurological disorders. Neurosurgery is a distinct specialty that involves a different training path, and emphasizes the surgical treatment of neurological disorders.

General caseload

Neurologists are responsible for the diagnosis, treatment, and management of all the conditions mentioned above. When surgical intervention is required, the neurologist may refer the patient to a neurosurgeon. In some countries, additional legal responsibilities of a neurologist may include making a finding of brain death when it is suspected that a patient has died. Neurologists frequently care for people with hereditary (genetic) diseases when the major manifestations are neurological, as is frequently the case. Lumbar punctures are frequently performed by neurologists. Some neurologists may develop an interest in particular subfields, such as stroke, dementia, movement disorders, headaches, epilepsy, sleep disorders, chronic pain management, multiple sclerosis, or neuromuscular diseases.

Overlap with psychiatry

Although mental illnesses are believed by many to be neurological disorders affecting the central nervous system, traditionally they are classified separately, and treated by psychiatrists. Neurological diseases often have psychiatric manifestations, such as post-stroke depression, depression and dementia associated with Parkinson's disease, mood and cognitive dysfunctions in Alzheimer's disease and Huntington disease, to name a few. Hence, there is not always a sharp distinction between neurology and psychiatry on a biological basis.

5.12 SUMMARY

The present Hospitals offering various services including Hospital laboratory service and Anaesthesia services; Obstetric and Gynaecology services; Neuro-Surgery service; Neurology services. The laboratory as you know exists for the sole purpose of providing diagnostic and management information for the physicians to aid in the patient care, the ultimate goal of laboratory is to attend to the ailing patients, carry out the investigations asked and prompt issue of accurate results for favour of diagnosis and treatment. Anaesthesiology is a high risk specialty. However the public at large are not aware of the risks involved in anaesthesia. Moreover, in the present system of anaesthesia practice in India, there is not much scope for interaction between the patient and the anaesthesiologist and hence there is no rapport between them. Under such circumstances, when something goes wrong, the patient or his relatives react in a hostile manner towards the anaesthesiologist and many a times they land up in a police station or court to seek Redressal

5.13 Key Words:

***Histopathology*:** Laboratory performing organ, tissues, cell examination for the diagnosis of various types of abnormalities /diseases is called as Histopathology Laboratory.

***Microbiology*:** This is the science which deals with study of microbes such as bacteria, viruses, parasites etc. The study involves the identification, morphological and cultural studies, serology and sensitivity of organisms responsible for causing the disease or commonly found as commensals.

Gynaecology: **Gynaecology** is the medical practice dealing with the health of the female reproductive systems (vagina, uterus, and ovaries) and the breasts.

Neurosurgery: it is the medical specialty concerned with the prevention, diagnosis, surgical treatment, and rehabilitation of disorders which affect any portion of the nervous system including the brain, spinal cord, peripheral nerves, and extra-cranial cerebrovascular system.

Neurology: Neurology is a branch of medicine dealing with disorders of the nervous system. Neurology deals with the diagnosis and treatment of all categories of conditions and disease involving the central and peripheral nervous system (and its subdivisions, the autonomic nervous system and the somatic nervous system); including their coverings, blood vessels, and all effector tissue, such as muscle.

5.14 Self-Assessment Questions

1) Explain services provided by the Hospital Laboratory
2) Give an account of Anaesthesia services in Hospital
3) Explain the Obstetrics and Gynaecology services available in Corporate Hospitals

5.15 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-6

INTENSIVE CARE UNIT (ICU)

OBJECTIVES:

To understand the ICU
To know different types of iCUs in Hospitals
To identify the roles of ICU Team
To understand the coronary care unit
To know the classification of Burns

STRUCTURE

6.1 Introduction to Intensive Care Unit (ICU)

6.2 Types of icus:

- **6.2.1 Neonatal intensive care unit (NICU)**
- **6.2.2 Paediatric intensive care unit (PICU)**
- **6.2.3 Psychiatric intensive care unit (PICU)**
- **6.2.4 Coronary care unit (CCU)**

6.2.5 Medical intensive care unit (MICU)

6.2.6 Neurological intensive care unit (Neuro ICU)

6.2.7 Trauma intensive care unit (Trauma ICU)

6.2.8 Post-anaesthesia care unit (PACU)

6.2.9 Surgical Intensive Care Unit (SICU)

6.3 Patients in the ICU

6.4 ICU Team

- **6.4.1 Physicians**
- **6.4.2 Nurses**
- **6.4.3 Respiratory therapists**
- **6.4.4 Physical therapists**
- **6.4.5 Nutritionists**
- **6.4.6 Social workers (patient care managers)**
- **6.4.7 Pastoral care workers**

6.5 Pain Control & Sedation in the ICU

6.6 Zoning in icus

6.7 Levels of icus

6.8 Common equipment in an ICU

6.9 Quality of care:

6.1 INTRODUCTION TO INTENSIVE CARE UNIT (ICU):

Intensive care units (ICUs) are specialist hospital wards that provide treatment and monitoring for people who are very ill. They're staffed with specially trained healthcare professionals and contain sophisticated monitoring equipment. Intensive care units (ICUs) are specially equipped hospital units that provide highly specialized care to patients who suffer from a serious injury or illness.

A multidisciplinary team (physicians, nurses, respiratory therapists, pharmacists) trained in care of critically ill or injured patients, provides continuous observation and monitoring as well as specialized care. The staff in ICUs can quickly make decisions for their patients to keep them comfortable and stable, and they have an extensive network of support staff and specialized equipment to assist them in their important work.

ICU

Patients are admitted to the ICU from an emergency room, from an operating room, from another care area within the same hospital, or after being transferred from another hospital. Admission is based on a physician finding that close observation or specialized monitoring and/or therapy is necessary. Once close observation and monitoring or specialized therapies are no longer required, the patient is discharged from the ICU to either a regular hospital room or a concentrated care (step-down) unit where modified observation or therapy can be administered.

Because the level of care required of critically ill patients does not diminish during the night, critical care units are busy 24 hours a day. There are many alarms on the monitoring equipment that sound at all hours, often making rest difficult. As patients improve, one of their first complaints is the lack of sleep they receive. This is usually a good sign that they have improved enough to move from the ICU.

6.2 Types of ICUs:

Hospitals may have ICUs that cater to a specific medical specialty or patient, such as those listed below:

***6.2.1 Neonatal intensive care unit (NICU*):**

This specialty unit cares for neonatal patients who have not left the hospital after birth. Common conditions cared for include prematurity and associated complications, congenital disorders or complications resulting from the birthing process.

NICU

6.2.2 Pediatric intensive care unit (PICU):

Pediatric patients are treated in this intensive care unit for life-threatening medical problems such as asthma, influenza or traumatic brain injury.

PICU

***6.2.3 Psychiatric intensive care unit* (PICU)**

6.2.4 *Coronary care unit* (CCU): Also known as Cardiac Intensive Care Unit (CICU) or Cardiovascular Intensive Care Unit (CVICU).

6.2.5 *Medical intensive care unit* (MICU)

6.2.6 *Neurological intensive care unit* (Neuro ICU):

Patients here are treated for aneurysms, brain tumors, stroke, rattlesnake bites and post surgical patients who have undergone various neurological surgeries and require hourly neurological exams.

6.2.7 *Trauma intensive care unit* (Trauma ICU):

These are found only in hospitals certified in Trauma and have a dedicated Trauma Emergency Department equipped with a team of surgeons, nurses, respiratory therapists, and radiological staff.

***6.2.8 Post-anaesthesia care unit (PACU)*:**

Also known as the post-operative recovery unit, or recovery room, the PACU provides immediate post-op observation and stabilization of patients following surgical operations and anaesthesia. Patients are usually held in such facilities for a limited amount of time, and must meet a set physiological criteria before transfer back to a ward with a qualified nurse escort.

***6.2.9 Surgical Intensive Care Unit (SICU)*:**

A specialized service in larger hospitals that provides inpatient care for critically ill patients on surgical services. As opposed to other ICUs, the care is managed by surgeons trained in critical-care.

SICU

6.3 Patients in the ICU:

In addition to being closely monitored, patients in ICU often require medication to keep them comfortable, which may diminish their level of responsiveness. The level of sedation will vary from person to person, depending on their condition. Some patients are easily arousable and are able to converse, while others may need to be sedated enough that they are unresponsive to verbal stimulation.

It is important to remember that although ICU patients may not be able to respond to a voice or touch, they may still be able to hear and feel. Visiting family members should talk to them, hold their hand, and let them know they are loved.

6.4 ICU Team:

Care in the ICU is provided by a multidisciplinary critical care team, which is composed of specially trained physicians, nurses, and other professionals. Each individual brings his or her particular expertise to the team. Members of the team may vary from hospital to hospital.

***6.4.1 Physicians*:**

The critical care attending, or intensivist, is a physician who is fully trained in internal medicine, surgery, or anesthesiology. In addition, the physician has received one or more years of specialized training in all aspects of care of critically ill patients. The critical care attending supervises the care of ICU patients. He or she constantly communicates with the other members of the critical care team as well as the primary admitting physician. The critical care attending may also consult with other physicians who are specialists in particular areas of medicine (e.g., heart disease, kidney disease, gastrointestinal disease) or surgery (e.g., general, vascular, or thoracic surgeons).

6.4.2 Nurses:

Critical care nurses have received specialized training in caring for critical care patients. The nurses provide around the clock bedside care and monitoring. They are in close contact with the physician in charge as well as other members of the critical care team.

6.4.3 Respiratory therapists:

Respiratory therapists are trained in monitoring the respiratory system and in handling any equipment required to assist in respiration. They will monitor all aspects of respiration, from oxygen delivered through a nasal cannula (tube with two short tubes that go into each nostril) to mechanical ventilators. They also administer any respiratory treatment used to improve a patient's respiratory status.

***6.4.4 Physical therapists*:**

Physical therapists are involved in the care of critically ill patients early on in their ICU stay. They help prevent disabilities and facilitate rehabilitation as soon as possible.

***6.4.5 Nutritionists*:**

Nutritionists are involved in calculating the nutritional needs of the critically ill patient and monitoring the nutritional balance on an ongoing basis.

6.4.6 Social workers (patient care managers):

Social workers assist families in dealing with all aspects of the illness from financial, to accommodations for family members, to long-term planning following ICU and hospital discharge.

***6.4.7 Pastoral care workers*:**

Pastoral care workers provide emotional and spiritual support for patients and family members of all denominations.

6.5 Pain Control & Sedation in the ICU

Comfort of ICU patients is a major goal. The two most commonly used medications used for patient comfort are pain medication and sedation. Physicians order the lowest amount necessary to achieve the desired effect. Patients are continuously assessed for adequate pain control or level of sedation. The sedation and pain medications may make patients less responsive, and at times, they may be totally unresponsive. Although this may be disconcerting to families, it is important to have patients adequately sedated for necessary care to be administered. As patients recover and the medications are decreased, the ability to respond appropriately will return.

Local anesthesia causes a loss of sensation in the anesthetized area. A local anesthesia is often used in conjunction with a sedative during certain procedures such as insertion of a central venous catheter. Occasionally, soft restraints are used in order to prevent patients from inadvertently pulling out their tubes or catheters. The nursing staff constantly monitors restraints.

6.6 Zoning in ICUs

An ICU unit may be zoned (i.e. red/green/yellow) where Patient placement is based on

- diagnosis
- criticality of illness
- safety risk
- stability

Sicker patients and "at risk" patients are closer to the nursing station and stable/transfer/observation patients are further away from the nursing station, allowing for a quieter sleep environment.

6.7 Levels of ICUs

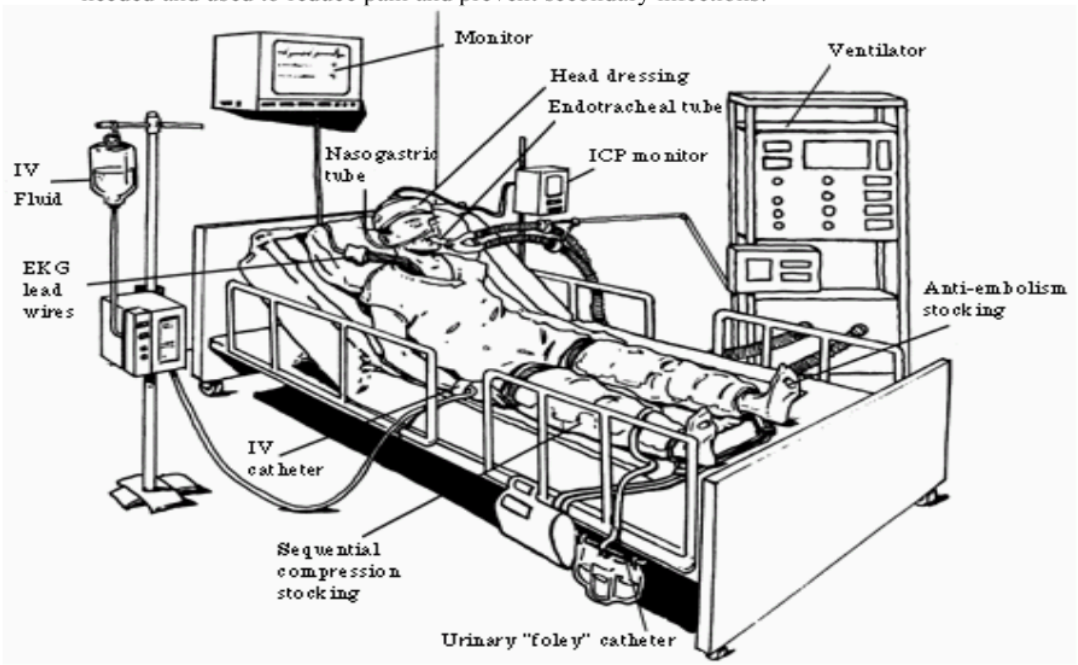
There are five different types and levels of ICU defined according to three main criteria:

- the nature of the facility,
- the care process and
- the clinical standards and staffing requirements
    - All levels and types of ICU must be separate and self-contained facilities in hospitals and, for clinical standards and staffing requirements, substantially conform to relevant guidelines. Five types of ICU are briefly described below:

1. **Adult intensive care unit, level 3:** It must be capable of providing complex, multisystem life support for an indefinite period; be a tertiary referral centre for patients in need of intensive care services and have extensive backup laboratory and clinical service facilities to support the tertiary referral role. It must be capable of providing mechanical ventilation, extracorporeal renal support services and invasive cardiovascular monitoring for an indefinite period; or care of a similar nature.
2. **Adult intensive care unit, level 2:** It must be capable of providing complex, multisystem life support and be capable of providing mechanical ventilation, extracorporeal renal support services and invasive cardiovascular monitoring for a period of at least several days, or for longer periods in remote areas or care of a similar nature.
3. **Adult intensive care unit, level 1:** It must be capable of providing basic multisystem life support usually for less than a 24-hour period. It must be capable of providing mechanical ventilation and simple invasive cardiovascular monitoring for a period of at least several hours; or care of a similar nature.
4. **Paediatric intensive care unit:** It must be capable of providing complex, multisystem life support for an indefinite period; be a tertiary referral centre for children needing intensive care; and have extensive backup laboratory and clinical service facilities to support this tertiary role. It must be capable of providing mechanical ventilation, extracorporeal renal support services and invasive cardiovascular monitoring for an indefinite period to infants and children less than 16 years of age.
5. **Neonatal intensive care unit, level 3**: It must be capable of providing complex, multisystem life support for an indefinite period. It must be capable of providing mechanical ventilation and invasive cardiovascular monitoring; or care of a similar nature.

6.8 Common equipment in an ICU

- Mechanical ventilators to assist breathing through an endotracheal tube or a tracheostomy tube;
- Cardiac monitors including those with telemetry; external pacemakers;
- Defibrillators
- Dialysis equipment for renal problems;
- Equipment for the constant monitoring of bodily functions;
- A web of intravenous lines, feeding tubes, nasogastric tubes, suction pumps, drains, and catheters
- A wide array of drugs to treat the primary condition(s) of hospitalization
- Medically induced comas, analgesics, and induced sedation are common ICU tools needed and used to reduce pain and prevent secondary infections.



6.9 Quality of care:

Higher ICU staffing is significantly associated with lower ICU and hospital mortality rates. A ratio of 2 patients to 1 nurse is recommended for a medical ICU. Most ICUs are staffed on a 2:1 basis (for high-dependency patients who require closer monitoring or more intensive treatment than a hospital ward can offer) or on a 1:1 basis for patients requiring very intensive support and monitoring.

6.10 ICU acquired Infections:

One of the important complications doctors face in ICUs is the occurrence of infections. The predominant types of infection and the ecology of potential pathogens vary between different ICU types and among similar types. This may be a result of factors such as patient case mix, device-utilization rates, teaching affiliation, and empirical antibiotic usage patterns. Different patient groups such as trauma patients, burn patients, or low birth weight neonates, have unique predispositions to different infections. There is a wide distribution of device-utilization rates and thus infection rates among these patient groups.

Outbreaks of infections are common in the ICU. Outbreaks may be of either exogenous or endogenous origin. Exogenous infections usually have a common inanimate or animate source such as contaminated equipment, whereas endogenous infections are transmitted from the patient with the outbreak strain. Indirect transmission from patient to patient on the hands of health care workers becomes the most important mode of transmission. In fact, the majority of recent outbreaks identified problems with infection control measures such as hand washing practices and environmental disinfection.

6.11 Risk Factors for ICU-Acquired Infections:

The most significant risk factor for nosocomial pneumonia in ICU patients is endotracheal intubation with mechanical ventilation, which increases the risk of pneumonia by 6 to 21 times.

Regarding other sites of infection, central catheters account for a majority of all infections. Scheduled replacement of catheters has not been shown to prevent infection. Duration of urinary catheterization is the most important risk factor for acquisition of nosocomial urinary tract infections (UTIs). Of uninfected patents, 2 to 16% will acquire a UTI for each day of catheterization. Naso-tracheal intubation is the most significant risk factor for acquisition of nosocomial sinusitis. Congestion of nasal blood vessels due to positive pressures used in mechanical ventilation, and the absence of gravitational forces in the supine position may impair sinus drainage. Other reported risk factors include nasogastric tubes, facial trauma, and colonization of the upper airway with gram-negative bacilli.

6.12 Coronary Care Unit:

An intensive care unit for patients with myocardial infarction (heart attack) is based on the fact that many patients die not because of extensive myocardial damage but due to potentially reversible arrhythmias. In recent years techniques of cardiac resuscitation have advanced considerably. Most nursing and medical staff are familiar with external cardiac massage and artificial ventilation, and many hospitals are in possession of some form of external defibrillator. The purpose of an intensive care area is simply to bring all patients at risk together in an adequately equipped ward unit and to provide the optimum facilities for early detection and treatment of complications after myocardial infarction.

A **coronary care unit** (**CCU**) or **cardiac intensive care unit** (**CICU**) is a hospital ward specialized in the care of patients with heart attacks, unstable angina, cardiac dysrhythmias and (in practice) various other cardiac conditions that require continuous monitoring and treatment. The main feature of coronary care is the availability of telemetry or the continuous monitoring of the cardiac rhythm by electrocardiography. This allows early intervention with medication, cardio version or defibrillation, improving the prognosis. As arrhythmias are relatively common in this group, patients with myocardial infarction or unstable angina are routinely admitted to the coronary care unit. For other indications, such as atrial fibrillation, a specific indication is generally necessary, while for others, such as heart block, coronary care unit admission is standard.

6.12.1 Acute coronary care

Acute coronary care units (ACCUs), also called "critical coronary care units" (CCCUs), are equivalent to intensive care in the level of service provided. Patients with acute myocardial infarction, cardiogenic shock, or post-operative "open-heart" patients commonly abide here.

6.12.2. Sub acute coronary care

Sub acute coronary care units (SCCUs), also called progressive care units (PCUs), intermediate coronary care units (ICCUs), or step down units, provide a level of care

intermediate to that of the intensive care unit and that of the general medical floor. These units typically serve patients who require cardiac telemetry, such as those with unstable angina.

Requirements for a coronary care unit:

- When a patient is cared for in a coronary care unit, a licensed registered nurse shall be on duty.
- At a minimum, the following equipment and supplies must be available in a coronary care unit:
    - oxygen, oxygen and suction apparatus;
    - defibrillator, resuscitator and respirator;
    - emergency drugs;
    - oscilloscope;
    - heart-rate meter with an alarm system;
    - an electrocardiograph which is activated simultaneously with the alarm system and which may also be activated manually or at predetermined intervals;
    - External pacemaker.

The position of the coronary care unit within the hospital is of considerable practical importance. The unit requires to be as near as possible to its main source of patients-the casualty department-and to its main area of patient discharge, the male general medical wards.

6.13 CCU Equipment:

Patient monitoring unit: the basic patient monitoring unit must include at least two ECG channels, invasive pressure channel, non-invasive blood pressure monitor, and an SaO2 metre. It is desirable that 50% of the beds include the following additional basic parameters: five ECG channels, two additional haemodynamic channels, end tidal CO2, non-invasive cardiac output, and thermometer.

Nurse station: to be used for central monitoring and analysing. At least one ECG lead from each patient as well as relevant haemodynamic and respiratory data should continuously be present on a central screen. Slave monitors should be installed to enable monitoring of patients from different sites of the unit, as well as working stations for retrospective analysis of index events, i.e. changes in heart rate, rhythm disturbances, ST-events (ST-segment changes algorithm), heart rate variability, blood pressure, O2 saturation, and so on.

CCU beds have to allow vertical movement, with the possibility of up and down head and leg positioning. Every bed must be equipped with oxygen, vacuum, and compressed-air intakes. It is important to make sure that the patient can be X-rayed on the bed.

Additional equipment:

- Volumetric pump/automatic syringe: four to six per bed
- mechanical respirators (including CPAP delivery system to use with face mask): one machine per two beds.
- intra-aortic balloon pump: one consol every three beds, up to the first six patients;
- haemodyalisis/haemofiltration machine: should be available
- pacemaker defibrillator (possibly biphasic): one apparatus every three beds.
- external pacemaker: one to two every six to eight beds
- temporary pacemakers: three to four every six to eight beds

- Mobile echocardiography machine: one (consider a portable one, according to future technology development), including a TEE probe
- blood clot metre (ACT): one
- biochemical markers kits, for myocardial infarction, optional (to be omitted provided that the biochemistry tests are in the central laboratory in ,30 min
- glucose level measurement kit: one
- blood gasses and electrolyte analyser: optional (to be omitted provided that the results of the blood gas and electrolyte tests come back from the central lab within 10 min)
- X-ray system for fluoroscopy: digital cardiac mobile C-arm enabling coronary angiography is recommended

Ideally, a fully equipped catheterization and PCI laboratory should be in close association with the Unit and ready to perform invasive procedure on a 24 h basis. An alternative route would be an available mobile unit to transfer a patient in need to a nearby catheterization laboratory.

6.14. Burns:

A **burn** is a type of injury to skin, or other tissues, caused by

- heat,
- cold,
- electricity,
- chemicals,
- friction, or
- radiation

Most burns are due to heat from hot liquids, solids, or fire. Burns are generally preventable. Underlying causes of burns often differ for males and females.

- Among women risk is related to use of open cooking fires or unsafe cook stoves.
- Among men, - risk is related to the work environments. Alcoholism and smoking are other risk factors.

Burns can also occur as a result of self harm or violence between people.

6.15 Classification of Burns:

Burns can be classified by depth, mechanism of injury, extent, and associated injuries. The most commonly used classification is based on the depth of injury.

6.15.1. Depth of injury:

- First-degree burns that affect only the superficial skin layers are known as superficial or first-degree burns. They appear red without blisters and pain typically lasts around three days.
- Second-degree burn When the injury extends into some of the underlying skin layer, it is a partial-thickness or second-degree burn. Blisters are frequently present and they are often very painful. Healing can require up to eight weeks and scarring may occur.
- Third-degree burn In a full-thickness or third-degree burn, the injury extends to all layers of the skin. Often there is no pain and the burn area is stiff. Healing typically does not occur on its own.
- Fourth-degree burn A fourth-degree burn additionally involves injury to deeper tissues, such as muscle, tendons, or bone. The burn is often black and frequently leads to loss of the burned part.

***6.15.2 Size of a burn**:*

The size of a burn is measured as a percentage of total body surface area (TBSA) affected by partial thickness or full thickness burns. First-degree burns that are only red in colour and are not blistering are not included in this estimation. Most burns (70%) involve less than 10% of the TBSA.

There are a number of methods to determine the TBSA, including the Wallace rule of nines, Lund and Browder chart, and estimations based on a person's palm size. The rule of nines is easy to remember but only accurate in people over 16years of age. More accurate estimates can be made using Lund and Browder charts, which take into account the different proportions of body parts in adults and children. The size of a person's handprint (including the palm and fingers) is approximately 1% of their TBSA.

The Wallace rule of nines is a tool used in pre-hospital and emergency medicine to estimate the total body surface area (BSA) affected by a burn. In addition to determining burn severity, the measurement of burn surface area is important for estimating patients' fluid requirements and determining hospital admission criteria.

6.16 Body part estimated BSA

- Entire left arm : 9%
- Entire right arm : 9%
- Entire head : 9%
- Entire chest : 9%
- Entire abdomen : 9%
- Entire back : 18%
- Entire left leg : 18%
- Entire right leg : 18%
- Groin : 1%

6.16.1 Treatment:

Tetanus toxoid should be given if not up to date. Treatment depends on the severity of the burn

❖ Superficial burns may be managed with little more than simple pain medication, while major burns may require prolonged treatment in specialized burn centers.[1]Cooling with tap water may help pain and decrease damage; however, prolonged cooling may result in low body temperature.

❖ Partial-thickness burns may require cleaning with soap and water, followed by dressings. It is not clear how to manage blisters, but it is probably reasonable to leave them intact if small and drain them if large.

❖ Full-thickness burns usually require surgical treatments, such as skin grafting.

❖ Extensive burns often require large amounts of intravenous fluid, due to capillary fluid leakage and tissue swelling.

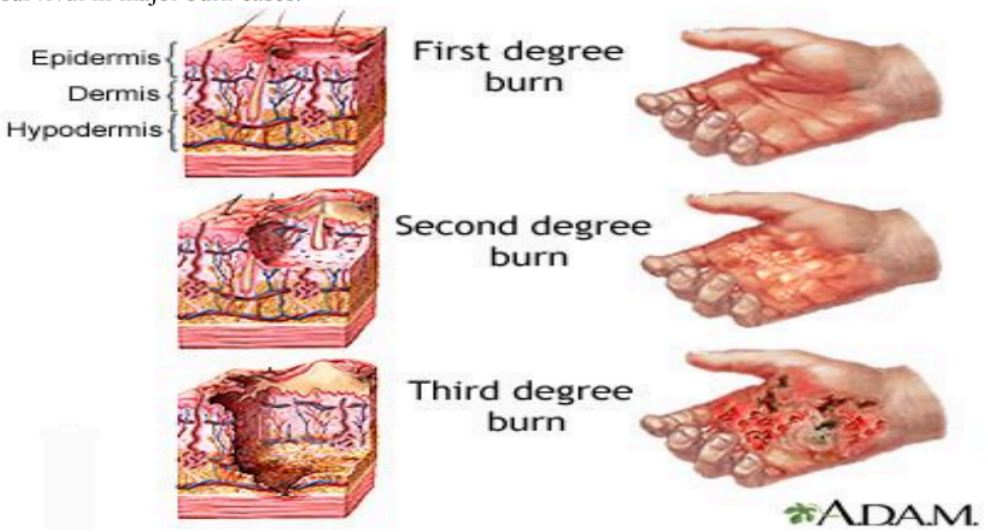
6.16.2 Outcomes

The most common complications of burns involve infection. Most deaths due to burns occur in the developing world, particularly in Southeast Asia. While large burns can be fatal, treatments have improved outcomes, especially in children and young adults. The long-term outcome is related to the size of burn and the age of the person affected.

***6.16.3 Burns Unit**:*

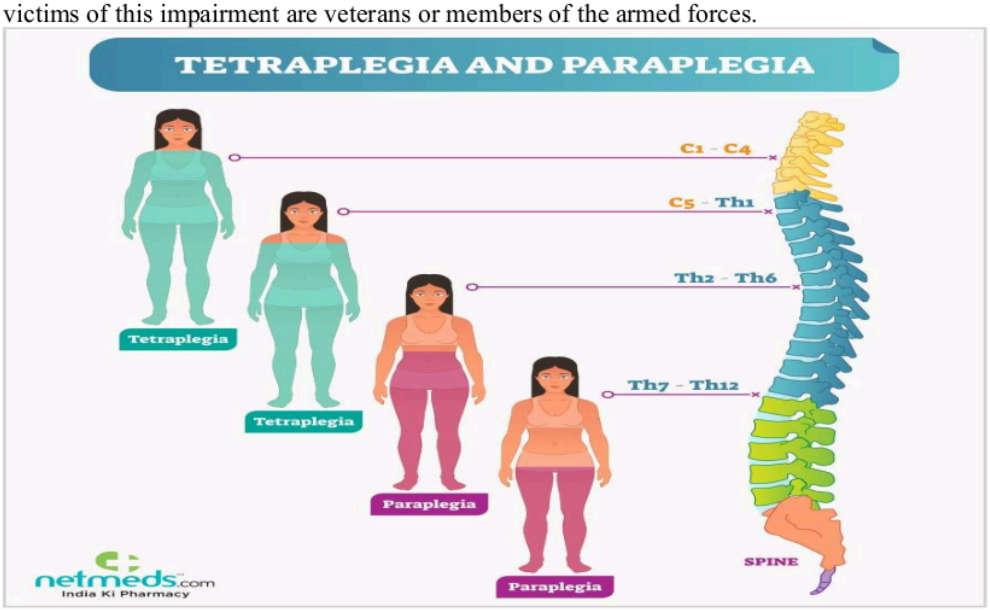
A burn center or burns unit is a hospital specializing in the treatment of burns. Burn centers are often used for the treatment and recovery of patients with more severe burns. Burn centers need a team approach for the management of critically burnt patient. Usually the burns management team consists of a plastic surgeon, intensivist, chest physician, general surgeon, pediatrician, microbiologist, psychiatrist, nutritionist, physiotherapist and a social

worker. Early burn wound excision and immediate wound cover can improve the chances of survival in major burn cases.



6.17 PARAPLEGIA

A loss of muscle activity and movement of both the lower limbs and / or also the sensation over the lower limbs is called Paraplegia. It is an impairment in motor or sensory function of the lower extremities. It is usually caused by spinal cord injury or a congenital condition that affects the neural (brain) elements of the spinal canal. The area of the spinal canal that is affected in paraplegia is either the thoracic, lumbar, or sacral regions. Common victims of this impairment are veterans or members of the armed forces.



Spastic paraplegia is a form of paraplegia defined by spasticity of the affected muscles, rather than flaccid paralysis.

The American Spinal Injury Association (ASIA) classifies spinal cord injury severity:

- ✓ ASIA A being the complete loss of sensory function and motor skills below the injury.
- ✓ ASIA B is having some sensory function below the injury, but no motor function.
- ✓ ASIA C some motor function below level of injury, but half the muscles cannot move against gravity.
- ✓ ASIA D, more than half of the muscles below the level of injury can move against gravity.
- ✓ ASIA E which is the restoration of all neurologic function

Rehabilitation: it is extremely important to teach paraplegics the basic skills to gain their independence. Individuals with paraplegia can range in their level of disability, requiring treatments to vary from case to case. From a rehabilitation standpoint, the most important factor is to gain as much functionality and independence back as possible. Physiotherapists spend many hours within a rehabilitation setting working on:

- strength
- range of motion/stretching
- transfer skills
- Wheelchair mobility: Most paraplegics will be dependent on a wheelchair as a mode of transportation.

Activities of daily living (ADLs) can be quite challenging at first for those with a spinal cord injury (SCI). With the aid of physiotherapists and occupational therapists, individuals with an SCI can learn new skills and adapt previous ones to maximize independence, often living independently within the community.

Hemiparesis, or unilateral paresis, is weakness of one entire side of the body (hemi-means "half"). Hemiplegia is a complete paralysis of half of the body. Hemiparesis and hemiplegia can be caused by different medical conditions, including congenital causes, trauma, tumors, or stroke.

6.18 MALIGNANT DISEASES TREATMENT

Malignant diseases or Cancers may be regarded as a group of diseases characterised by an

1. abnormal growth of cells
2. ability to invade adjacent tissues and even distant organs, and
3. the eventual death of the affected patient if the tumour has progressed beyond that stage when it can be successfully removed

Cancer can occur at any site or tissue of the body and may involve any type of cells. The major categories of cancer are:

- Carcinomas, which arise from cells lining the internal surfaces of the various organs (e.g. mouth, esophagus, intestines, uterus) and from the skin.
- Sarcomas, which arise from the various connective tissues e.g. fibrous tissue, fat and bone).
- Lymphomas, myeloma and leukemias arising from the cells of bone marrow and immune systems.

The term "primary tumour" is used to denote cancer in the organ of origin, while "secondary tumour" denotes cancer that has spread to regional lymph nodes and distant organs. When cancer cells multiply and reach a critical size, the cancer is clinically evident as a lump or ulcer localized to the organ of origin in early stages. As the disease advances, symptoms and signs of invasion and distant metastases becomes clinically evident.

In terms of incidence, the most common cancers worldwide are

- lung cancer (12.3 per cent of all cancers)
- breast cancer (10.4 per cent) and
- colorectal cancer (9.4 per cent)

The four most frequent cancers in males in India are:

- mouth/oropharynx
- esophagus
- stomach
- respiratory tract (trachea/bronchus/lungs)

For women cancers of the most frequent cancers are:

- cervix
- breast
- mouth/oropharynx
- oesophagus

Among Indian women, cancers of the cervix, ovary and breast account for nearly 60 percent of all cancers. Cervical cancer is closely associated with poor genital hygiene, early consummation of marriage, multiple pregnancies, and contact with multiple sexual partners. Breast cancer is related to late marriage, birth of the first child at a later age, fewer children, and shorter periods of breast feeding which are increasingly common practices among the urban women.

6.19 CANCER CONTROL

Cancer control consists of a series of measures based on present medical knowledge in the fields of prevention, detection, diagnosis, treatment, after care and rehabilitation, aimed at reducing significantly the number of new cases, increasing the number of cures and reducing the invalidism due to cancer.

The basic approach to the control of cancer is through primary and secondary prevention. It is estimated that at least one-third of all cancers are preventable.

6.19.1. (1) PRIMARY PREVENTION:

Cancer prevention until recently was mainly concerned with the early diagnosis of the disease (secondary prevention), preferably at a precancerous stage. Advancing knowledge has increased our understanding of causative factors of some cancers and it is now possible to control these factors in the general population as well as in particular occupational groups.

They include the following:

- **CONTROL OF TOBACCO AND ALCOHOL CONSUMPTION**: Primary prevention offers the greatest hope for reducing the number of tobacco-induced and alcohol related cancer deaths. It has been estimated that control of tobacco smoking alone would reduce the total burden of cancer by over a million cancers each year
- **PERSONAL HYGIENE**: improvement in personal hygiene may lead to declines in the occurance e of certain types of cancer, e.g., cancer cervix.
- **RADIATION**: Special efforts should be made to reduce the amount of radiation (including medical radiation) received by an individual to a minimum without reducing the benefits.
- **OCCUPATIONAL EXPOSURES**: The occupational aspects are frequently neglected. Measures to protect workers from exposure to industrial carcinogens should be enforced in factories.
- **IMMUNIZATION** : In the case of primary liver cirrhosis, immunization against hepatitis B virus presents an important prospect,
- **FOODS, DRUGS AND COSMETICS**: All these should be tested for carcinogens,

- **AIR POLLUTION** : the control of air pollution is another preventive measure.
- **TREATMENT OF PRECANCEROUS LESIONS** : Early identification and prompt treatment of precancerous lesions such as intestinal polyposis, warts, chronic gastritis, chronic cervicitis, and adenomata is one of the cornerstones of cancel prevention,
- **LEGISLATION** : Legislation has also a role in primary prevention. For example, legislation to control known environmental carcinogens (e.g., tobacco, alcohol) is inadequate or only moderately enforced in a number of countries,
- **CANCER EDUCATION** : An important method of primary prevention is cancer education. It should be focused at "high-risk" groups. The aim of cancer education is be motivate people to seek early diagnosis and early treatment.

The warning signs ("danger signals") of cancer are:

1. lump or hard area in the breast
2. change in a wart or mole
3. persistent change in digestive and bowel habits
4. persistent cough or hoarseness
5. excessive loss of blood at the monthly period or loss of blood outside the usual dates
6. blood loss from any natural orifice
7. swelling or sore that does not get better
8. unexplained loss of weight

6.19.2 SECONDARY PREVENTION:

Secondary prevention comprises the following measures:

1. CANCER REGISTRATION Cancer registration is necessary for any cancer control programme. It provides a base for assessing the magnitude of the problem and for planning the necessary services. Cancer registration is basically of two types : hospital-based and population based.

(a) HOSPITAL-BASED REGISTRIES: The hospital-based registry includes all patients treated by a particular institution, whether in-patients or out-patients. Registries should collect the uniform minimum set of data recommended in the "WHO Handbook for Standardized Cancer Registers". If there is a long-term follow-up of patients, hospital-based registries can be of considerable value in the evaluation of diagnostic and treatment programmes.

(b) POPULATION -BASED REGISTRIES: A right step is to set up a "hospital-based cancer registry" and extend the same to a "population-based cancer registry". The aim is to cover the cancer situation in a given geographic area. The optimum size of base population for a population based cancer registry is in the range of 2-7 million. The data from such register alone can provide the incidence rate of cancer and serve as a useful tool for initiating epidemiological enquiries into causes of cancer, surveillance of time trends, and planning and evaluation of operational activities in all main areas of cancer control. Population-based cancer registries have been established at Bangalore, Mumbai, Delhi, Bhopal, Barshi and Chennai under the National Cancer Registry Project of the ICMR.

2. **EARLY DETECTION OF CASES**: Cancer screening is the main weapon for early detection of cancer at a pre-invasive (in situ) or pre-malignant stage. Effective screening programmes have been developed I cervical cancer, breast cancer and oral cancer. Like primary prevention, early diagnosis has to be conducted on a large scale; however, it may be possible to increase the efficiency of the screening programmes by focusing on high-risk groups. Clearly, there is no point in detecting cancer at an early stage unless facilities for treatment and aftercare are available. Cancer detection programmes will require mobilization of all available resources and development of a cancer infrastructure starting at the level of

primary health care, ending with complex cancer centres or institutions at the state or national levels.

3. TREATMENT: Treatment facilities should be available to all cancer patients. Certain forms of cancer are amenable to surgical removal, while some others respond favourably to radiation or chemotherapy or both. Since most of the known methods of treatment have complementary effect on the ultimate outcome of the patient, multi-modality approach to cancer control has become a standard practice in cancer centres all over the world. In the developed countries today, cancer treatment is geared to high technology. For those who are beyond the curable stage, the goal must be to provide pain relief. A largely neglected problem in cancer care is the management of pain. The WHO has developed guidelines for relief of cancer pain. "Freedom from cancer pain" is now considered a right for cancer patients

6.19.3 CANCER SCREENING

In the light of present knowledge, early detection and prompt treatment of early cancer and precancerous conditions provide the best possible protection against cancer for the individual and the community. Now a good deal of attention is being paid to screening for early detection of cancer. This approach, that is, cancer screening may be defined as the "search for unrecognized malignancy by means of rapidly applied tests".

Cancer screening is possible because:

1. In many-instances, malignant disease is preceded for a period of months or years by a premalignant lesion, removal of which prevents subsequent development of cancer;
2. Most cancers begin as localised lesions and if found at this stage a high rate of cure is obtainable
3. As much as 75 per cent of all cancers occur in body sites that are accessible.

6.20 METHODS OF CANCER SCREENING

1. Mass screening by comprehensive cancer detection examination: A rapid clinical examination, and examination of one or more body sites by the physician is one of the important approaches for screening for cancer,
2. Mass screening at single sites : This comprises examination of single sites such as uterine cervix, breast or lung,
3. Selective screening ; This refers to examination of those people thought to be at special risk, for example, parous women of lower socio-economic strata upwards of 35 years of age for detection of cancer cervix, chronic smokers for lung cancer, etc.

6.21 Nursing service:

Nursing profession is considered a caring profession to begin with, it was an art and a vocation. Now it is considered a scientific profession nursing care is defined as the care of the patient with regard to nursing needs, with he ever increasing dimension of medical sciences quantitatively and qualitatively nursing care is becoming more and more complex with its management services. Nursing service is the part of the total health organization which aims at satisfying the nursing needs of the patients/community. In nursing services, the nurse works with the members of allied disciples such as dietetics, medical social service, pharmacy etc. in supplying a comprehensive program of patient care in the hospital.

6.21.1 Definition of Nursing Services:-

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

6.21.2 OBJECTIVE OF NURSING IN WARD:-

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

6.21.3. ORGANISATION OF NURSING SERVICES:-

CHIEF NURSING OFFICER
|
NURSING SUPDT
|
DY. NURSING SUPDT.
|

ASSTT. NURSING SUPDT.
|
WARD SISTER-CLINICAL SUPERVISOR
|
STAFF NUIRSE ----âSTUDENT NURSE

6.22 EFFECTIVE NURSING:-

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

Entire nursing process consists of four phases:-

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

ACTORS TO BE CONSIDERED IN PLANNING HOSPITAL NURSING SERVICES:-

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

DAY TO DAY PROBLEM IN NURSING SERVICES:-

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

6.23 SUMMARY

Intensive care units (ICUs) are specialist hospital wards that provide treatment and monitoring for people who are very ill. They're staffed with specially trained healthcare professionals and contain sophisticated monitoring equipment. Intensive care units (ICUs) are specially equipped hospital units that provide highly specialized care to patients who suffer from a serious injury or illness. Patients are admitted to the ICU from an emergency room, from an operating room, from another care area within the same hospital, or after being transferred from another hospital. Admission is based on a physician finding that close observation or specialized monitoring and/or therapy is necessary. Once close

observation and monitoring or specialized therapies are no longer required, the patient is discharged from the ICU to either a regular hospital room or a concentrated care (step-down) unit where modified observation or therapy can be administered.

Because the level of care required of critically ill patients does not diminish during the night, critical care units are busy 24 hours a day. There are many alarms on the monitoring equipment that sound at all hours, often making rest difficult. As patients improve, one of their first complaints is the lack of sleep they receive. This is usually a good sign that they have improved enough to move from the ICU.

6.24 Key Words: ICU, PICU, SICU, Nutritionist, CCU, Paraplegia

ICU: Intensive care units (ICUs) are specialist hospital wards that provide treatment and monitoring for people who are very ill.

PICU: Pediatric patients are treated in this intensive care unit for life-threatening medical problems such as asthma, influenza or traumatic brain injury.

SICU: A specialized service in larger hospitals that provides inpatient care for critically ill patients on surgical services.

Nutritionist: Nutritionists are involved in calculating the nutritional needs of the critically ill patient and monitoring the nutritional balance on an ongoing basis.

CCU**:** A **coronary care unit** (**CCU**) or **cardiac intensive care unit** (**CICU**) is a hospital ward specialized in the care of patients with heart attacks, unstable angina, cardiac dysrhythmias and (in practice) various other cardiac conditions that require continuous monitoring and treatment

Paraplegia**:** A loss of muscle activity and movement of both the lower limbs and / or also the sensation over the lower limbs is called Paraplegia

6.25 Self-Assessment Questions

1) Write the short notes on the following
   a) ICU
   b) NICU
   c) PICU
   d) CCU
2) Write in detail about Paraplegia
3) Give an account of nursing services in Hospital
4) Explain in detail about Burns and classification of Burns and treatment

6.26 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.

4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-7

MEDICAL TERMINOLOGY

OBJECTIVE

- To understand Medical Terminology
- To know the Glossary related to medical terms, accreditation
- To understand major diseases and medical specialities
- To know the critical care medicines
- To understand the prefixes and suffixes

STRUCTURE

7.1 INTRODUCTION:

Every profession has a range of special terms used by the practitioners in that field. As someone who may work in healthcare area, need to read, write and speak and understand medical terms as they are used daily in medical terms.

7.2 Medical Terminology:

Medical terminology is a type of language that describes words, diseases and medical-related terms used in the healthcare industry. It includes a listing of drug names, symptoms and medications as well as the various parts of the anatomy. Medical terminology is also used extensively in the medical billing and claims process. How Would a Chart About Medical Terminology Benefit Anyone? Knowledge of medical terminology is beneficial to patients because it can give them insight into their health and well-being. It can also help those working in medical professions perform more efficiently. It's also a course required in almost any healthcare program.

Word Parts

- ✓ -algia pain, painful condition
- ✓ -dys- bad, difficult, or painful
- ✓ -ectomy surgical removal, cutting out
- ✓ hyper- excessive, increased
- ✓ hypo- deficient, decreased
- ✓ -itis inflammation
- ✓ -osis abnormal condition, disease
- ✓ -ostomy the surgical creation of an artificial opening to the body surface
- ✓ -otomy cutting, surgical incision
- ✓ -plasty surgical repair
- ✓ -rrhage bleeding, abnormal excessive fluid discharge
- ✓ -rrhaphy surgical suturing
- ✓ -rrhea flow or discharge
- ✓ -rrhexis rupture
- ✓ -sclerosis abnormal hardening

7.3 Glossary of Medical terms:

Glossary of medical terms is a list of definitions about medicine, its sub-disciplines, and related fields **Medicine.**

S.no.	Medical term	Description
1	Abdomen / Abdominal	Area between the chest and the hips that contains the stomach, small intestine, large intestine, liver, gallbladder, pancreas, and spleen.
2	Anaesthesiologist	Specialist who administers anesthetics (drugs or other agents to prevent or relieve pain during medical procedures) to a patient before being treated.
3	Angiography	X-ray that uses dye injected into arteries so that blood circulation can be studied.
4	Angioplasty	The use of a small balloon on the tip of a catheter inserted into a blood vessel to open up an area of blockage inside the vessel.
5	Anteroposterior	In x-ray imaging, taken or viewed from front to back (as opposed to from back to front, which is poster anterior).
6	Aortic Aneurysm	Swelling of the main blood vessel leaving the heart (aorta), usually representing an underlying weakness in the wall of the aorta at that location.

7	Aortic Valve	The valve that regulates blood flow from the heart into the aorta.
8	Appendectomy	Surgical removal of the vermiform appendix.
9	Average Total Charges	The estimated average total charges a person will experience when in the hospital for an inpatient stay or outpatient procedure.
1	Basic Metabolic Panel	A group of eight tests used as a general screening tool.
11	Bilateral	Affecting both sides of the body. For example, bilateral breast cancer is cancer occurring in both breasts at the same time.
12	Bilirubin	Bilirubin is a substance formed when hemoglobin breaks down. A bilirubin test measures the amount of bilirubin in the blood.
13	Blood Type ABO	A blood test that categorizes blood into one of four types: A, B, AB or O.
14	Blood Type Rh	A blood test that checks for the presence or absence of the Rh antigen, also called the Rh factor.
15	Brain Lesion	A destructive change in brain tissue, such as a wound, injury or inflammation
16	Cautery	Instrument or substance used to destroy tissue by burning it with a hot iron, electric current, caustic, or by freezing it.
17	CC	Complication or comorbidity
18	C Difficile	Clostridium difficile: an intestinal bacteria that can be detected by a culture.
19	Cellulitis	Subcutaneous inflammation of connective tissue.
20	Cervical Spine	The area of the spinal cord located in the neck.
21	Coronary	Coronary arteries come from the aorta to provide blood to the heart muscle.
22	Coronary Bypass	Surgical procedure in which a healthy blood vessel is transplanted from another part of the body into the heart to replace or bypass a diseased vessel.
23	Coronary Catheterization	Minimally invasive procedure that accesses coronary circulation and blood-filled chambers of the heart using a catheter. It is performed for both diagnostic and interventional (treatment) purposes.
24	Coronary	Coronary arteries come from the aorta to provide blood to the heart muscle.
25	Coronary Bypass	Surgical procedure in which a healthy blood vessel is transplanted from another part of the body into the heart to replace or bypass a diseased vessel.
26	CT Scan	Computed Tomography (CT) is a non-invasive, diagnostic procedure that uses a series of x-rays to show a cross-sectional view of the inside of the body.
27	Cystocele	Condition in which weakened pelvic muscles cause the base of the bladder to drop from its usual position down into the vagina.
28	Debride	To cleanse by surgical removal of lacerated or contaminated tissue.
29	Diagnostic X-Ray	Diagnostic test that uses invisible electromagnetic energy beams to produce images of internal tissues, bones, and organs onto film.
30	DRG Code	Diagnosis-Related Group (DRG) is a code system used to classify hospital cases for the purpose of reimbursements from programs such as Medicare.

31	Drug-Eluting Stent	A stent is a small, lattice-shaped, metal tube inserted permanently into an artery to hold it open so that blood can flow through it. Drug-eluting stents are stents that contain drugs that reduce the chance the arteries becoming blocked.
32	Duodenum	The first section of the small intestine.
33	Edema	An abnormal excess accumulation of serous fluid in connective tissue or in a serous cavity.
34	Embolism	The sudden obstruction of a blood vessel by an embolus.
35	Endarterectomy	The surgical removal of plaque or blood clots in an artery.
36	Endometrium	Mucous membrane lining of the inner surface of the uterus that grows during each menstrual cycle and is shed in menstrual blood.
37	Endoscopic	Relating to a procedure that uses an endoscope, a long, flexible, lighted tube, to diagnose or treat a condition.
38	Enterocele	Prolapse of the small intestine through the top of the vagina.
39	Esophageal Sphincter	A circular band of muscle which connects the esophagus to the stomach.
40	Estimated Average Charge	The estimated average charge is an approximate calculation of the total hospital charges for a specific service or procedure at a Purple.org facility. It is not a fixed quote. An estimated average charge does not include other fees from your surgeon, anesthesiologist, pathologist or radiologist.
41	Ethmoid Sinus	Sinus of the meatuses (passageways) of the nasal cavity (behind the bridge of the nose).
42	Extremity	That part of a limb that is farthest from the torso.
43	Edema	An abnormal excess accumulation of serous fluid in connective tissue or in a serous cavity.
44	Embolism	The sudden obstruction of a blood vessel by an embolus.
45	Endarterectomy	The surgical removal of plaque or blood clots in an artery.
46	Fluoroscopy	Study of moving body structures, similar to an X-ray "movie." A continuous X-ray beam is passed through the body part being examined, and is transmitted to a TV-like monitor so that the body part and its motion can be seen in detail.
47	Forearm	The part of the arm between the elbow and the wrist.
48	Free T4	A test to help evaluate thyroid function.
49	Gastroenterostomy	Surgical creation of an opening between the stomach wall and the small intestines; performed when the normal opening has been eliminated.
50	Glucose Test	A test to measure the amount of a type of sugar in the blood.
51	Hemoglobin	Hemoglobin is a substance within red blood cells that carries oxygen throughout your body.
52	Hematocrit	This test measures the amount of space (volume) red blood cells occupy in the blood.
53	Hernia	Protrusion of part of an organ through the muscle that surrounds it.
54	HIV	Human immunodeficiency virus (HIV) is a virus that attacks the immune system, making it difficult for the body to fight infection and disease.
55	Hysterectomy	Surgical removal of the uterus.
56	Image Post-Processing	Manipulating the information from the CT scan to better visualize the part of the body that is being examined.

57	Infusion	The introducing of a solution into a vein.
58	Inpatient Procedure	A procedure that requires the patient to stay at the hospital at least one night.
59	Insurance (Commercial/Private)	An employer provided or personally purchased insurance policy that provides coverage for health care services. Deductibles, coinsurance, out-of-pocket limits and types of coverage vary.
60	Laparoscopic	Relating to the use of a viewing tube with a lens or camera (and a light on the end), which is inserted through a small incision in the abdomen to examine the contents of the abdomen and remove tissue samples.
61	Lipase	Lipase is an enzyme that helps digest fats.
62	Lipid Panel	A group of tests used to measure lipids, or fatty substances, in the body. The panel includes total cholesterol, types of cholesterol and triglycerides.
63	Liver/Hep Function Panel	A group of tests used to detect and monitor liver disease or damage.
64	Magnesium Level	A test to measure the amount of magnesium in the blood.
65	Mammogram	X-ray of the breast tissue.
66	Mammography	Diagnostic procedure to detect breast tumors by the use of X-rays.
67	MRI (Magnetic Resonance Imaging)	Diagnostic procedure that uses a combination of large magnets, radiofrequencies, and a computer to produce detailed images of organs and structures within the body.
68	Nasal Septum	Partition of bone and cartilage between the nasal cavities.
69	Natriuretic Peptide/Brain Natriuretic Peptide (BNP) Test	A test for natriuretic peptide or brain natriuretic peptide, a hormone that is an indicator of how efficiently the heart is working.
70	Neonate	A newborn infant.
71	Otitis	Inflammation of the ear.
72	Outpatient Location	A non-hospital surgical facility dedicated to providing outpatient surgery and procedures.
73	Outpatient Procedure	A procedure that does not require the patient to stay overnight at the hospital.
74	Obstetric Panel	A group of blood tests performed before and during a pregnancy.
75	Pathologist	Physician who identifies diseases by studying cells and tissues under a microscope.
76	PCR	Polymerase chain reaction, a technique used in a number of laboratory tests.
77	Procedure Code	A code used by all hospitals, physicians and insurance companies to identify a specific type of service or procedure.
78	Pulmonary Embolisms	Blockage of the pulmonary (lung) artery by foreign matter or by a blood clot.
79	Quality of Care	Learn about HonorHealth's quality of care.
80	Quality Report Card	View HonorHealth's quality report cards.
81	Radiologist	Physician specializing in the field of radiology (x-rays or other imaging technologies, such as ultrasound and magnetic resonance imaging) to diagnose or treat disease.
82	Reduction of Fracture	Correction or realignment of a broken bone.

83	Retroperitoneal	Relating to the area behind the abdominal cavity, including: kidneys, bladder, and portions of the duodenum, pancreas, and colon.
84	Roux-en-Y Laparoscopic	A form of gastric bypass surgery that can also be performed as an open procedure when necessary.
85	Spinal Canal	The passageway in successive vertebrae through which the spinal cord passes.
86	Stoma	Mouth like surgical opening on the surface of the body to create access to an internal organ.
87	Supine	Lying face upward.
88	Surgeon	Physician who specializes in surgery.
89	Thoracic	Relating to the chest or thorax.
90	Throat Culture	A test to detect and identify a bacterial, fungal or viral infection in the throat.
91	Thyroid Gland	Endocrine gland located in the neck that regulates metabolism (the chemical processes in the body) and growth; the gland produces thyroid hormone.
92	Ultrasound	Diagnostic imaging technique which uses high-frequency sound waves and a computer to create images of blood vessels, tissues, and organs. Ultrasounds are used to view internal organs as they function, and to assess blood flow through various vessels.
93	Umbilical	Referring to the rope-like cord connecting the fetus to the placenta. The umbilical cord contains two arteries and a vein, which carry oxygen and nutrients to the fetus and waste products away from the fetus.
94	Urinalysis	A physical or chemical test of the urine.
95	Urine Pregnancy Test	A test to look for human chorionic gonadotropin (hCG), also called the pregnancy hormone. This hormone is only present during pregnancy.
96	Vascular	Pertaining to blood vessels.
97	Vena Cava	Either of two large veins that return oxygen-depleted blood to the right atrium of the heart.
98	Ventral	Toward or on or near the belly.
99	Vitamin B12	Vitamin B12 is necessary for creating new red blood cells, maintaining nervous system health, and growth and development in children.
100	X-Ray	Diagnostic test which uses invisible electromagnetic energy beams to produce images of internal tissues, bones, and organs onto film

7.4 Glossary related to Hospital Accreditation

Accreditation	Accreditation is self-assessment and external peer review process used by health care organisations to accurately assess their level of performance in relation to established standards and to implement ways to improve the health care system continuously.
Advance life support	Emergency medical care for sustaining life, including defibrillation, airway management, and drugs and medications.
Adverse event	An injury related to medical management, in contrast to complications of the disease. Medical management includes all aspects of care, including diagnosis and treatment, failure to diagnose or treat, and the systems and equipment used to deliver care. Adverse events may be preventable or non-

	preventable. (WHO Draft Guidelines for Adverse Event Reporting and Learning Systems)
Assessment	All activities including history taking, physical examination, laboratory investigations that contribute towards determining the prevailing clinicalstatus of the patient.
Basic life support	Basic life support (BLS) is the level of medical care which is used for patients with life-threatening illnesses or injuries until the patient can be given fullmedical care
Breakdown maintenance	Activities which are associated with the repair and servicing of site infrastructure, buildings, plant or equipment within the site's agreed building capacity allocation which have become inoperable or unusable because of the failure of component parts.
Calibration	Set of operations that establish, under specified conditions, the relationship between values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realised by standards.
Clinical audit	A quality improvement process that seeks to improve patient care and outcomes through systematic review of care against explicit criteria and the implementation of change. (Reference: Principles for Best Practice in Clinical Audit 2002, NICE/CHI)
Clinical autopsy	It is a surgical procedure that consists of an examination of a corpse by dissection to identify the cause, mode and manner of death or to evaluate any disease or injury that may be present for research or educational purposes.
Confidentiality	Restricted access to information to individuals who have a need, a reason and permission for such access. It also includes an individual's right to personal privacy as well as the privacy of information related to his/her healthcare records.
Consent	1. The willingness of a party to undergo examination/procedure/ treatment by a healthcare provider. It may be implied (e.g. patient registering in OPD), expressed which may be written or verbal. Informed consent is a type of consent in which the healthcare provider has a duty to inform his/her patient about the procedure, its potential risk and benefits, alternative procedure with their risk and benefits so as to enable the patient to make an informed decision of his/her health care. 2. In law, it means active acquiescence or silent compliance by a person legally capable of consenting. In India, the legal age of consent is 18 years. It may be evidenced by words or acts or by silence when silence implies concurrence. Actual or implied consent is necessarily an element in every contract and every agreement.
Discharge summary	A part of a patient record that summarises the reasons for admission, significant clinical findings, procedures performed, treatment rendered, patient's condition on discharge and any specific instructions given to the patient or family (for example follow-up medications).
Drug Administration	The giving of a therapeutic agent to a patient, e.g. by infusion, inhalation, injection, paste, pessary, suppository or tablet.
	Helps all those with an advanced, progressive, incurable illness to live as well as possible until they die. It enables the supportive and palliative care needs of both patient and family to be identified and met throughout the last

End-of-life Care	phase of life and into bereavement. It includes management of pain and other symptoms and provision of psychological, social, spiritual and practical support.
Failure Mode and Effect Analysis (FMEA)	A method used to prospectively identify error risks within a particular process.
Grievance- handling procedures	The sequence of activities carried out to address the grievances of patients, visitors, relatives and staff.
Hazardous materials	Substances dangerous to human and other living organisms. They include radioactive or chemical materials.
Healthcare- associated infection	Healthcare-associated infection (HAI), also referred to as "nosocomial" or "hospital" infection, is an infection occurring in a patient during the process of care in a hospital or other health care facility which was not present or incubating at the time of admission. (Reference: World Health Organization)
High Risk/High Alert Medications	High-risk/high-alert medications are medications involved in a high percentage of medication errors or sentinel events and medications that carry a high risk for abuse, error, or other adverse outcomes. Examples include medications with a low therapeutic index, controlled substances, psychotherapeutic medications, and look-alike and sound-alike medications.
Incident reporting	It is defined as written or verbal reporting of any event in the process of patient care, that is inconsistent with the deserved patient outcome or routine operations of the healthcare facility.
Intent	A brief explanation of the rationale, meaning and significance of the standards laid down in a particular chapter.
Isolation	Separation of an ill person who has a communicable disease (e.g.,measles, chickenpox, mumps, SARS) from those who are healthy. Isolation prevents transmission of infection to others and also allows the focused delivery of specialised health care to ill patients. The period of isolation varies from disease-to-disease. Isolation facilities can also be extended to patients for fulfilling their individual, unique needs.
Job specification	1. The qualifications/physical requirements, experience and skills required to perform a particular job/task. 2. A statement of the minimum acceptable qualifications that an incumbent must possess to perform a given job successfully.
Medical equipment	Any fixed or portable non-drug item or apparatus used for diagnosis, treatment, monitoring and direct care of a patient.
Medication error	A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional practice, health care products, procedures, and systems, including prescribing; order communication; product labelling, packaging, and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use. (Reference: The National Coordinating Council for Medication Error Reporting and Prevention)
	A near-miss is an unplanned event that did not result in injury, illness, or

Near-miss	damage--but had the potential to do so. Errors that did not result in patient harm, but could have, can be categorisedas near-misses.
	Certain specified diseases, which are required by law to be notified to the
	public health authorities. Under the international health regulation (WHO's
	International Health Regulations 2005), the following diseases are always
	notifiable to WHO:
	(a) Smallpox
	(b) Poliomyelitis due to wild-type poliovirus
	(c) Human influenza caused by a new subtype
	(d) Severe acute respiratory syndrome (SARS).
	In India, the following is an indicative list of diseases which are also
	notifiable, but may vary from state to state: (a) Polio (b) Influenza
	(c) Malaria
	(d) Rabies
	(e) HIV/AIDS
	(f) Louse-borne typhus
	(g) Tuberculosis
	(h) Leprosy
	(i) Leptospirosis
	(j) Viral hepatitis
	(k) Dengue fever
Patient-care setting	The location where a patient is provided health care as per his needs, e.g. ICU, speciality ward, private ward and general ward.
Patient-reported outcome measures(PROMs)	Patient-reported outcome measures are questionnaires measuring the patients' views of their health status.
Patient Satisfaction and	Patient satisfaction is a measure of the extent to which a patient is content with the health care which they received from their health care provider. Patient satisfaction is thus a proxy but a very effective indicator to measure the success of Health care providers.
Point of careequipment	Medical Equipment that is used to deliver care/intervene at or near the site of patient care. These are primarily Point-of-care testing (POCT), or bedside testing equipment that helps in reducing turn-around times. POCT Machine examples; Glucometer, ABG Analyser, Stat Lab at ICU/ER, portable USG etc.
Prescription	A prescription is a document given by a physician or other healthcare practitioner in the form of instructions that govern the care plan for an individual patient. Legally, it is a written directive, for compounding or dispensing and administration of drugs, or for other service to a particular patient. (Reference: Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, Seventh Edition, Saunders)
Protocol	A plan or a set of steps to be followed in a study, an investigation or an intervention.
Quality assurance	Part of quality management focussed on providing confidence that quality requirements will be fulfilled (Para 3.2.11 of ISO 9000:2015).

Quality improvement	Ongoing response to quality assessment data about a service in ways that improve the process by which services are provided to consumers/patients.
Risk assessment	Risk assessment is the determination of the quantitative or qualitative value of risk related to a concrete situation and a recognised threat (also called hazard). Risk assessment is a step in a risk management procedure.
Risk mitigation	Risk mitigation is a strategy to prepare for and lessen the effects of threats and disasters. Risk mitigation takes steps to reduce the negative effects of threats and disasters.
Root Cause Analysis (RCA)	Root Cause Analysis (RCA) is a structured process that uncovers the physical, human, and latent causes of any undesirable event in the workplace. Root cause analysis (RCA) is a method of problem-solving that tries to identify the root causes of faults or problems that cause operating events. RCA practice tries to solve problems by attempting to identify and correct the root causes of events, as opposed to simply addressing their symptoms. By focusing correction on root causes, problem recurrence can be prevented. The process involves data collection; cause charting, root cause identification and recommendation generation and implementation.
Safety	The degree to which the risk of an intervention/procedure, in the care environment is reduced for a patient, visitors and healthcare providers.
Safety programme	A programme focused on patient, staff and visitor safety.
Scope of services	Range of clinical and supportive activities that are provided by a healthcare organisation.
Security	Protection from loss, destruction, tampering, and unauthorised access or use.
Standards	A statement of expectation that defines the structures and process that mustbe substantially in place in an organisation to enhance the quality of care.
Sterilisation	It is the process of killing or removing microorganisms including their sporesby thermal, chemical or irradiation means.
Triage	Triage is a process of prioritising patients based on the severity of their condition so as to treat as many as possible when resources are insufficient for all to be treated immediately.
Turn-around-time	Turnaround Ttime (TAT) means the amount of time taken to complete a process or fulfil a request.
Vulnerable patient	Those patients who are prone to injury and disease by virtue of their age, sex, physical, mental and immunological status,e.g. infants, elderly, physically- and mentally-challenged, semiconscious/unconscious, those on immunosuppressive and/or chemotherapeutic agents.
Workplace violence	Incidents where staff are abused, threatened or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, well-being or health. (Adapted from European Commission)

7.5 Glossary related to House keeping

Alcohol-based Hand Rub (ABHR)	A liquid, gel or foam formulation of alcohol (e.g., ethanol, isopropanol) which is used to reduce the number of microorganisms on hands in clinical situations when the hands are not visibly soiled. ABHRs contain emollients to reduce skin irritation and are less time-consuming to use than washing with soap and water.(1)
Antiseptic:	An agent that can kill microorganisms and is applied to living tissue and skin.

Audit:	A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements, are implemented effectively and are suitable to achieve objectives.
Biomedical Waste:	Means any waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or in research activities pertaining thereto or in the production or testing of Biologicals, and including categories mentioned in Schedule I of Biomedical Waste Management Handling Rules 1998.
Cleaning:	The physical removal of foreign (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms). Cleaning physically removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action.
Contamination:	The presence of an infectious agent on hands or on a surface such as clothes, gowns, gloves, bedding, toys, surgical instruments, patient care equipment, dressings or other inanimate objects**.**
Disinfectant:	A product that is used on surfaces or medical equipment/devices which results in disinfection of the equipment/device. Disinfectants are applied only to inanimate objects. Some products combine a cleaner with a disinfectant.
Enzymatic Cleaner	A pre-cleaning agent that contains protease enzymes that break down proteins such as blood, body fluids, secretions and excretions from surfaces and equipment. Most enzymatic cleaners also contain a detergent. Enzymatic cleaners are used to loosen and dissolve organic substances prior to cleaning.
Fomites:	Objects in the inanimate environment that may become contaminated with microorganisms and serve as vehicles of transmission.
Low-Level Disinfection (LLD):	Level of disinfection required when processing non-invasive medical equipment (i.e., non-critical equipment) and some environmental surfaces. Equipment and surfaces must be thoroughly cleaned prior to low-level disinfection
Material Safety Data Sheet (MSDS):	A document that contains information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with a chemical product. It also contains information on the use, storage, handling and emergency procedures all related to the hazards of the material. MSDSs are prepared by the supplier or manufacturer of the material.
Precautions:	Interventions to reduce the risk of transmission of microorganisms (e.g., patient-to-patient, patient-to-staff, staff-to-patient, contact with the environment, contact with contaminated equipment).
Sanitation -	Promotion of hygiene and prevention of disease by maintenance of sanitary condition.(4)
Personal Protective Equipment (PPE)	Clothing or equipment worn by staff for protection against hazards.

7.6 Major diseases and medical specialties

In India, roughly 5.8 million Indians die because of diabetes, cancer, stroke, heart and lung diseases each year. In other words, out of 4 Indians 1 has risks dying from an NCD

before the age of 70. About 1.7 million Indian's deaths caused by heart diseases every year, according to the World Health Organisation.

7.7 Top 10 Deadliest Diseases in India

1. Cardiovascular Diseases (CVD) Cardiovascular diseases are a range of conditions that affect your heart. ...
2. Stroke. ...
3. Respiratory Diseases. ...
4. Tuberculosis (TB) ...
5. Chronic Obstructive Pulmonary Disease. ...
6. Diabetes. ...
7. Alzheimer's Disease and Other Dementias. ...
8. Malaria.
9. Basic and Clinical Immunology: It deals with the study of and management of diseases and disorders of the human immune system.

***7.7.1 Cardiology**:*

Cardiology is a branch of medicine dealing with disorders of the heart as well as parts of the circulatory system. The field includes medical diagnosis and treatment of congenital heart defects, coronary artery disease, heart failure, valvular heart disease and electrophysiology. Physicians who specialize in this field of medicine are called cardiologists.

7.7.2 Endocrinology:

Endocrinology is a branch of biology and medicine dealing with the endocrine system, its diseases, and its specific secretions known as hormones.

***7.7.3 Gastroenterology*:**

It is the branch of medicine focused on the digestive system and its disorders. Diseases affecting the gastrointestinal tract, which include the organs from mouth to anus, along the alimentary canal, are the focus of this speciality. Physicians practicing in this field are called gastroenterologists.

7.7.4 Hematology:

It is the branch of medicine concerned with the study of the cause, diagnosis, treatment, and prevention of diseases related to blood. It involves treating diseases that affect the production of blood and its components, such as blood cells, hemoglobin, blood proteins, bone marrow, platelets, blood vessels, spleen, and the mechanism of coagulation. Such diseases might include hemophilia, blood clots, other bleeding disorders and blood cancers such as leukemia, multiple myeloma, and lymphoma.

7.7.5 Oncology:

Oncology is a branch of medicine that deals with the prevention, diagnosis, and treatment of cancer. A medical professional who practices oncology is an oncologist.

7.7.6 Infectious Diseases:

It is a medical specialty dealing with the diagnosis, control and treatment of infections. An infectious disease (ID) specialist's practice may consist largely of managing nosocomial (hospital-acquired) infections, or it may be out-patient based. 15

7.7.7 Nephrology:

It is a specialty of medicine that concerns itself with the kidneys: the study of normal kidney function and kidney problems, the preservation of kidney health, and the treatment of kidney problems, from diet and medication to renal replacement therapy (dialysis and kidney transplantation).

7.8. **Occupational medicine**:

It is the branch of medicine which deals with the maintenance of health in the workplace, including the prevention and treatment of diseases and injuries, and also promotes productivity and social adjustment

7.9 Environmental Medicine:

The scope of this field involves studying the interactions between environment and human health, and the role of the environment in causing or mediating disease.

7.10 Pulmonary Diseases:

The study of respiratory disease is known as pulmonology. A doctor who specializes in respiratory disease is known as a pulmonologist, a chest medicine specialist, a respiratory medicine specialist, a respirologist or a thoracic medicine specialist. Respiratory disease is a medical term that encompasses pathological conditions affecting the organs and tissues that make gas exchange possible in higher organisms, and includes conditions of the upper respiratory tract, trachea, bronchi, bronchioles, alveoli, pleura and pleural cavity, and the nerves and muscles of breathing. Respiratory diseases range from mild and self-limiting, such as the common cold, to life-threatening entities like bacterial pneumonia, pulmonary embolism, acute asthma and lung cancer.

7.11 Critical Care Medicine:

Critical care medicine is a branch of medicine concerned with the diagnosis and management of life-threatening conditions that may require sophisticated organ support and invasive monitoring. Intensive care is usually only offered to those whose condition is potentially reversible and who have a good chance of surviving with intensive care support. A prime requisite for admission to an intensive care unit (ICU) is that the underlying condition can be overcome.

7.12 Rheumatology:

Rheumatology deals with the diagnosis and therapy of rheumatic diseases. Physicians who specialize in rheumatology are called rheumatologists. Rheumatologists deal mainly with clinical problems involving joints, soft tissues, autoimmune diseases, vasculitides, and heritable connective tissue disorders

7.13 Word Roots:

A word root is the core, or main part, of the medical term. Most medical terms have a word root. Think of a word root as the word stem without a prefix or suffix.

In many cases, you will have to memorize the meanings of word roots. You already know many common word roots, because some everyday words also are derived from them. Keep in mind that sometimes there are two or more word roots with the same meaning. Once you know what the root word means, you'll be able to understand many other words that contain the root word. Memorize the meanings of the following common word roots, and then complete the exercises that follow.

Word Root	Meaning
cardi	heart
cerebr	brain, cerebrum
colo, colon	colon (section of large intestine)
crani	cranium, skull
dermat	skin
gastr	stomach
nephr	kidney
neuron	nerve

ost	bone
pulmon	lung
ren	kidney
vas	vessel

7.14 Medical prefixes and suffixes

Medical terminology follows the same structural rules all language does, including use of prefixes and suffixes. You may be familiar with some of these from words outside the realm of medicine.

7.14.1 Prefixes

Prefixes: letters added to the beginning of a medical word to modify the meaning . Prefixes are located at the beginning of a medical term. The prefix alters the meaning of the medical term. It is important to spell and pronounce prefixes correctly.

Many prefixes that you find in medical terms are common to English language prefixes. A good technique to help with memorization is the following:

- Start by reviewing the most common prefixes.
- Consider common English language words that begin with the same prefixes.
- Compare them to the examples of use in medical terms.

Common Prefixes

Prefix	Meaning	Example of use in Medical Terms
A-, An-	Without; Lacking	Anemia
Andr/o-	Male	Androgen
Anti-	Against	Anticholinergic drugs
Auto-	Self	Autocrine
Bio-	Life	Biology
Chem/o-	Chemistry	Chemotherapy
Contra-	Against	Contraception
Cyt/o-	Cell	Cytokine
Dis-	Separation; Taking apart	Dissection

Dys-	Difficult; Abnormal	Dyspnea
Eu-	Good; Well	Eupnea
Fibr/o-	Fiber	Fibrosis
Gluco-, Glyco-	Glucose; Sugar	Glycogen
Gyn/o-, Gynec-	Female	Gynecology
Hydr/o-	Water	Hydrocephalus
Idio-	Self; One's own	Idiopathic
Lyso-, Lys-	Break down; Destruction; Dissolving	Lysosome
Mal-	Bad; Abnormal	Malignant
Myc/o-	Fungus	Mycetoma
Necr/o-	Death	Necrosis
Neo-	New	Neonate
Oxy-	Sharp; Acute; Oxygen	Oxytocin
Pan-, Pant/o-	All or everywhere	Pancytopenia
Pharmaco-	Drug; Medicine	Pharmacist
Re-	Again; Backward	Rejuvenation

Somat/o-, Somatico-	Body; Bodily	Somatic cell

7.14.2 Body Part Prefixes

Prefix	Meaning	Example of use in Medical Terms
Acous/o-	Hearing	Acoustic meatus
Aden/o-	Gland	Adenoid
Adip/o-	Fat	Adipocyte
Adren/o-	Gland	Adrenal cortex
Angi/o-	Blood vessel	Angioplasty
Arteri/o-	Artery	Arteriole
Arthr/o-	Joint	Arthroplasty
Bucc/o-	Cheek	Buccal cavity
Bronch/i-	Bronchus	Bronchioles
Burs/o-	Bursa	Bursa
Carcin/o-	Cancer	Basal cell carcinoma
Cardi/o-	Heart	Cardiology
Cephal/o-	Head	Cephalic flexure
Chol-	Bile	Cholesterol

Chondri-	Cartilage	Chondrosarcoma
Coron-	Heart	Coronary arteries
Cost-	Rib	Costal cartilage
Crani/o-	Brain	Cranium
Cutane-	Skin	Cutaneous
Cyst/o-, Cysti-	Bladder or sac	Cystoscopy
Derm-, Dermat/o-	Skin	Dermatologist
Duoden/o-	Duodenum	Duodenitis
Gastr-	Stomach	Gastrectomy
Gloss-	Tongue	Glossectomy
Hem-, Hema-, Hemat-, Hemo-, Hemat/o-	Blood	Hematopoiesis
Hepat/o-, Hepatico-	Liver	Hepatic portal system
Hist/o-, Histio-	Tissue	Histology
Hyster/o-	Uterus	Hysterectomy
Ileo-	Ileum	Ileostomy
Ischi/o-	Ischium	Ischial tuberosity

Kerat/o-	Corena (eye or skin)	Keratin
Lacrim/o-	Tear (from your eyes)	Lacrimal fluid
Lact/o-, Lacti-	Milk	Lactose
Laryng/o-	Larynx	Laryngitis
Lingu/o-	Tongue	Lingual tonsil
Lip/o-	Fat	Lipolysis
Lymph/o-	Lymph	Lymphocyte
Mamm-, Mast/o-	Breast	Mammary glands
Mening/o-	Meninges	Meningitis
Muscul/o-	Muscle	Musculoskeletal
My/o-	Muscle	Myocardium
Myel/o-	Spinal cord or bone marrow	Myelin
Nephr/o-	Kidney	Nephron
Neur/i-, Neur/o-	Nerve	Neuron
Oculo-	Eye	Oculomotor nerve
Onco-	Tumor; Bulk; Volume	Oncogene

Onych/o-	Fingernail; Toenail	Onychodystrophy
Oo-	Egg; Ovary	Oocyte
Oophor/o-	Ovary	Oophorectomy
Op-, Opt-	Vision	Optic nerve
Ophthalm/o-	Eye	Ophthalmic artery
Orchid/o-, Orchio-	Testis	Orchidectomy
Orth/o-	Straight; Normal; Correct	Orthostatic
Osseo-	Bony	Osseous tissue
Ossi-	Bone	Ossicles
Ost-, Oste/o-	Bone	Osteoporosis
Ot/o-	Ear	Otolaryngologist
Ovar/i-, Ovario-, Ovi-, Ovo-	Ovary	Ovarian follicle
Phalang-	Phalanx	Phalanges
Pharyng/o-	Pharynx; Throat	Pharyngeal tonsil
Phleb/o-	Vein	Phlebotomist
Phren/i-, Phreno-, Phrenico-	Diaphragm	Phrenic nerve

Pleur-, Pleur/a-, Pleur/o-	Rib, pleura	Pleural cavity
Pneum/a- Pneumat/o-	Air; Lung	Pneumonia
Proct/o-	Anus; Rectum	Proctoscopy
Prostat-	Prostate	Prostatectomy
Pseudo-	False	Pseudostratified
Psych/o-, Psyche-	Mind	Psychiatrist
Radio-	Radiation; Radius	Radioisotopes
Ren/o-	Kidney	Renal cortex
Retin-	Retina (of the eye)	Retinitis pigmentosa
Rhin/o-	Nose	Rhinoscope
Salping/o-	Tube	Salpingo-oophorectomy
Sarco-	Muscular; Flesh-like	Sarcomere
Schiz/o-	Split; Cleft	Schizophrenia
Sclera-, Sclero-	Hardness	Sclerosis
Sigmoid/o-	Sigmoid colon	Sigmoidoscopy
Sperma-, Spermo-, Spermato-	Sperm	Spermatocyte

Splen/o-	Spleen	Splenomegaly
Sten/o-	Narrowed; Blocked	Stenosis
Stern-	Sternum	Sternoclavicular joint
Stom/a-, Stomat/o-	Mouth	Stomatitis
Thorac/o-, Thoracico-	Chest	Thoracic cavity
Thromb/o-	Blood clot	Thrombolytic
Thyr/o-	Thyroid gland	Thyroiditis
Trache/o-	Trachea	Trachealis
Tympan/o-	Eardrum	Tympanic membrane
Ur/o-	Urine	Urologist
Vagin-	Vagina	Vaginal
Varic/o-	Duct; Blood vessel	Varicose veins
Vasculo-	Blood vessel	Vasculitis
Ven/o-	Vein	Venae cavae
Vertbr-	Vertebra; Spine	Vertebral column

7.14.3 Color Prefixes

Prefix	Meaning	Example of use in Medical Terms
Chlor/o-	Green	Chlorophyll
Chrom-, Chromato-	Color	Chromosome
Cyano-	Blue	Cyanosis
Erythr/o-	Red	Erythrocyte
Leuk/o-	White	Leukocyte
Melan/o-	Black	Melanin

7.14.4 Physical Property and Shape Prefixes

Prefix	Meaning	Example of use in Medical Terms
Cry/o-	Cold	Cryotherapy
Elect-	Electrical activity	Electrocardiogram
Kin/o-, Kine-, Kinesi/o-	Movement	Kinetic energy
Kyphy/o-	Humped	Kyphosis
Rhabd/o-	Rod-shaped; Striated	Rhabdomyosarcoma
Phot/o-	Light	Photoreceptor
Reticul/o-	Net	Reticulocytes

Scoli/o-	Twisted	Scoliosis
Therm/o-	Heat	Thermotherapy

7.14.5 Direction and Position Prefixes

Prefix	Meaning	Example of use in Medical Terms
Ab-, Abs-	Away from	Abductor
Ad-	Towards	Adductor
Ante-	Before; Forward	Antenatal
Circum-	Around	Circumcision
Cycl-	Circle; Cycle	Cyclic neutropenia
De-	Away from; Ending	Dehydration
Dia-	Across; Through	Diagnosis
Ect/o-, Exo-	Outer; Outside	Exocrine gland
End/o-, Ent-, Enter/o-	Within; Inner	Endocrine gland
Epi-	Upon; Outside of	Epidermis
Ex-, Extra-	Beyond	Expiration
Infra-	Beneath; Below	Infratemporal fossa

Inter-	Between	Interstitial fluid
Intra-	Within	Intracellular fluid
Meso-	Middle	Mesoderm
Meta-	Beyond; Change	Metabolism
Para-	Alongside; Abnormal	Parathyroid glands
Path/o-	Disease	Pathologist
Peri-	Around	Pericardium
Post-	Behind; After	Postpartum
Pre-	Before; In front	Precancerous
Retro-	Backward; Behind	Retroperitoneum
Sub-	Under	Subcutaneous layer
Super-	Above	Superior
Supra-	Above; Upon	Supraglottis
Sy-, Syl-, Sym-, Syn-, Sys-	Together	Syndrome
Trans-	Across; Through	Transdermal

7.14.6 Quantity Prefixes

Prefix	Meaning	Example of use in Medical Terms
Bi-	Two	Biceps
Brady-	Slow	Bradycardia
Diplo-	Double	Diploid
Hemi-	Half	Hemihypertrophy
Hetero-	Other; Different	Heterogeneous
Homo-	Same	Homozygous genotype
Hyper-	Above; Beyond; Excessive	Hypertension
Hypo-	Under; Deficient	Hypotension
Iso-	Equal; Like	Isointense
Macro-	Large; Long; Big	Macrophage
Mic-, Micro-	Small	Microglia
Mon-, Mono-	One	Monocyte
Olig/o-	Few; Little	Oliguria
Poly-	Many; Excessive	Polyuria
Quadri-	Four	Quadriceps

Semi-	Half	Semilunar valves
Tachy-	Fast	Tachycardia
Tetra-	Four	Tetralogy of Fallot
Tri-	Three	Triceps
Uni-	One	Unicellular

Prefix	Meaning	Prefix	Meaning	Prefix	Meaning
a-	without, lack of	cyst(o)-	pertaining to the bladder or any fluid-containing sac	inter-	between
ab-	away from	cyt(o)-	pertaining to a cell	intra-	within
abdomi(n)-	abdomen	de-	down from	iso-	equal
acr(o)-	pertaining to an extremity	dermat(o)-	pertaining to the skin	latero-	side
ad-	to, toward	di-	twice, double	leuk(o)-	pertaining to anything white or to leukocytes (white blood cells)
aden(o)-	pertaining to a gland	dia-	through, completely	lith(o)-	pertaining to a stone
an-	without, lack of	dys-	difficult, painful, abnormal	macro-	large
ana-	up, back, again	ect(o)-	out from	mal-	bad or abnormal
angio-	vessel	electro-	pertaining to electricity	medi-	middle
ante-	before, forward	end(o)-	within	mega-	large
anti-	against, opposed to	enter(o)-	pertaining to the intestines	melan-	black
arteri(o)-	artery	epi-	upon, on	mening(o)-	pertaining to a membrane, particularly the meninges
arthro-	pertaining to a joint	erythr(o)-	pertaining to anything red or to erythrocytes (red blood cells)	micro-	small
auto-	self	eu-	easy, good, normal	mono-	one
bi-	two	ex(o)-	outside	myel(o)-	pertaining to the spinal cord, the bone marrow, or myelin
bi(o)-	pertaining to life	extra-	outside, in addition	my(o)-	pertaining to muscle
blast(o)-	germ or cell	gastr(o)-	pertaining to the stomach	nas(o)-	pertaining to the nose
blephar(o)-	pertaining to an eyelid	glyc(o)-	sugar	ne(o)-	new
brady-	slow	gynec(o)-	pertaining to females or the female reproductive organs	nephr(o)-	pertaining to the kidney
calc-	stone; also heel	hemat(o)-	pertaining to blood	neur(o)-	pertaining to a nerve or the nervous system
cardi(o)-	pertaining to the heart	hemi-	half	noct-	night
cephal(o)-	pertaining to the head	hem(o)-	pertaining to blood	olig(o)-	little, deficient
cerebr(o)-	pertaining to the cerebrum, a part of the brain	hepat(o)-	pertaining to the liver	oophor(o)-	pertaining to the ovary
cervic(o)-	pertaining to the neck or the uterine cervix	heter-	other, different	ophthalm(o)-	pertaining to the eye
chole-	pertaining to bile	hom-	same or like	orchid(o)-	pertaining to the testicles
chondr(o)-	pertaining to cartilage	hydr(o)-	water	orchi(o)-	pertaining to the testicles
circum-	around, about	hyper-	over, excessive	oro-	pertaining to the mouth
contra-	against, opposite	hypo-	under, deficient	ortho-	straight or normal
cost(o)-	pertaining to a rib	hyster(o)-	pertaining to the uterus	oste(o)-	pertaining to bone
cyan(o)-	blue	infra-	below	ot(o)-	pertaining to the ear

7.15 Suffixes:

Letters added to the end of a medical word to change its meaning. Suffixes are word parts that are located at the end of words. Suffixes can alter the meaning of medical terms. It is important to spell and pronounce suffixes correctly.

Suffixes in medical terms are common to English language suffixes. Suffixes are not always explicitly stated in the definition of a word. It is common that suffixes will not be explicitly stated when defining a medical term in the workplace. However, when transcribing or reading medical reports the suffix is always clearly written. In order to properly spell and pronounce medical terms, it is helpful to learn the suffixes.

Common Suffixes

SUFFIX	MEANING	EXAMPLE OF USE IN MEDICAL TERMS
-ac	Pertaining to	Cardiac
-blast, -blasto, -blastic	Bud; Germ	Myeloblast
-cyte, -cytic	Cell	Thrombocyte
-dynia	Pain; Swelling	Thoracodynia
-eal, -ial	Pertaining to	Esophageal
-ectasis	Expansion; Dilation	Atelectasis
-emia	Blood condition	Anemia
-ia	Condition	Hemophilia
-iasis	Condition; Formation of	Psoriasis
-ism	Condition	Hypothyroidism
-ites, -itis	Inflammation	Arthritis

-ity	Pertaining to	Immunity
-ium	Structure or tissue	Epithelium
-lysis, -lytic	Break down; Destruction; Dissolving	Osteolytic
-malacia	Softening	Osteomalacia
-megaly	Enlargement	Acromegaly
-oid	Resembling	Arachnoid trabeculae
-oma	Tumor	Angiosarcoma
-osis	Condition; Usually abnormal	Endometriosis
-ous	Pertaining to	Aqueous
-pathy	Disease	Lymphadenopathy
-penia	Deficiency; Lack of	Thrombocytopenia
-phagia, -phagy	Eating; Swallowing	Dysphagia
-phasia	Speech	Aphasia
-plasia, -plastic	Growth	Hyperplasia
-plegia	Paralysis	Hemiplegia
-pnea	Breathing	Sleep apnea

-poiesis	Production	Hemopoiesis
-ptosis	Falling; Drooping	Apoptosis
-rrhage, -rrhagic	Bleeding	Hemorrhage
-rrhea	Flow or discharge	Diarrhea
-sclerosis	Hardening	Arteriosclerosis
-sis	Condition	Agranulocytosis
-stasis	Level; Unchanging	Homeostasis
-trophy	Growth	Hypertrophy
-uria	In the urine	Anuria

s.no	Suffixes	Meaning
1	-algia	pertaining to pain
2	-asthen(o)	weakness
3	-blast	immature cell
4	-cele	pertaining to a tumor or swelling
5	-centesis	pertaining to a procedure in which an organ or body cavity is punctured, often to drain excess fluid or obtain a sample for analysis

6	-cyte	cell
7	-ectomy	surgical removal of
8	-emia	pertaining to the presence of a substance in the blood
9	-genic	causing
10	-gram	record
11	-graph	a record or the instrument used to create the record
12	-itis	inflammation

- ✓ **A-, an-** : Lack of or without.
- ✓ **-ation** : Indicates a process.
- ✓ **Dys-** : Abnormal, difficult, or painful.
- ✓ **–ectomy** : Surgical removal of something.
- ✓ **–ismus** : Indicates a spasm or contraction.
- ✓ **–it is** : Signifies inflammation.
- ✓ **–lysis** : Decomposition, destruction, or breaking down.
- ✓ **Macro-** : Large in size.
- ✓ **Melan/o-** : Black or dark in color.
- ✓ **Micro-** : Small in size.
- ✓ **–ology** : The study of a particular concentration.
- ✓ **–osis** : Indicates something that is abnormal.
- ✓ **–otomy** : To cut into.
- ✓ **–pathy** : Disease or disease process.
- ✓ **–plasty** : Surgical repair.
- ✓ **Poly-** : Many.
- ✓ **Pseudo-** : False or deceptive, usually in regard to appearance.
- ✓ **Retro-** : Behind or backward.

7.16. SUMMARY

Medical terminology is a type of language that describes words, diseases and medical-related terms used in the healthcare industry. It includes a listing of drug names, symptoms and medications as well as the various parts of the anatomy. Medical terminology is also used extensively in the medical billing and claims process. How Would a Chart About Medical Terminology Benefit Anyone? Knowledge of medical terminology is beneficial to patients

because it can give them insight into their health and well-being. It can also help those working in medical professions perform more efficiently. It's also a course required in almost any healthcare program.

In India, roughly 5.8 million Indians die because of diabetes, cancer, stroke, heart and lung diseases each year. In other words, out of 4 Indians 1 has risks dying from an NCD before the age of 70. About 1.7 million Indian's deaths caused by heart diseases every year, according to the World Health Organisation

7.17 Key Words: Medical Terminology, suffixes, Glossary of Medical Terms, Accreditation, calibration, oncology.

Medical Terminology: Medical terminology is a type of language that describes words, diseases and medical-related terms used in the healthcare industry. It includes a listing of drug names, symptoms and medications as well as the various parts of the anatomy.
Suffixes: Letters added to the end of a medical word to change its meaning. Suffixes are word parts that are located at the end of words. Suffixes can alter the meaning of medical terms. It is important to spell and pronounce suffixes correctly
Glossary of Medical Terms: Glossary of medical terms is a list of definitions about medicine, its sub-disciplines, and related fields Medicine.
Accreditation: Accreditation is self-assessment and external peer review process used by health care organisations to accurately assess their level of performance in relation to established standards and to implement ways to improve thehealthcare systemcontinuously

Calibration: Set of operations that establish, under specified conditions, the relationshipbetween values of quantities indicated by a measuring instrument or measuring system, or values represented by a material measure or a reference material, and the corresponding values realised by standards.
Protocol: A plan or a set of steps to be followed in a study, an investigation or anintervention.
Endocrinology: It is a branch of biology and medicine dealing with the endocrine system, its diseases, and its specific secretions known as hormones.
Oncology: Oncology is a branch of medicine that deals with the prevention, diagnosis, and treatment of cancer. A medical professional who practices oncology is an oncologist

7.18 Self-Assessment Questions

1) Elucidate Medical terminology followed in Hospital
2) Describe the Major diseases and medical specialities in super speciality hospital
3) Define Prefixes and suffixes also explain different suffixes followed in hospitals
4) Explain different words roots
5) write the short notes on the following.
    a) Cardiology
    b) Gastroenterology
    c) Oncology
    d) Hematology

7.19 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-8
COMMON ROOTS
ELEMENT REFERRING TO, USAGE AND DEFINITION; COMMON PREFIXES AND SUFFIXES; COMMON ABBREVIATIONS

OBJECTIVES:

- To understand the medical root
- To know common prefixes and suffixes
- To understand common abbreviations used in hospital

STRUCTURE

8.1 COMMON ROOT

The root of a word is the foundation of a medical term and provides the general meaning of the word. It can be a whole word or part of a word. Medical root words come from many different languages (e.g., Greek, Latin, Arabic, French, and German) and find their way into

English. Some commonly used medical root words in their combining form, their meaning, and examples are listed below.

8.1.1 A – Medical Root Words

Roots	**Meanings**	**Examples (Definitions)**
abdomin(o)-	abdomen	abdominoscopy (an internal examination of the abdomen, usually with an endoscope)
acou-	hearing	acoustics (the science of sounds)
acr(o)-	extremity, peak	acrocyanosis (a blue coloration of the extremities, i.e. the fingers, toes, ears and nose, which is due to poor circulation)
aden(o)-	gland	adenocarcinoma (a malignant tumour of a gland)
adipo-	fat	adiposis (a state where too much fat is accumulated in the body)
andr(o)-	male	androsterone (one of the male sex hormones)
angi(o)-	blood vessel	angiosarcoma (a malignant tumour in a blood vessel)
ankyl	crooked, fusion	ankylosis (a condition in which the bones of a joint fuse together)
arteri(o)-	arteries	arteriopathy (a disease of an artery)
arthr(o)-	joint	arthroplasty (a surgical operation to repair or replace a joint)

8.1.2 B – Medical Root Words

Roots	**Meanings**	**Examples (Definitions)**
bili	bile	biliuria (the presence of bile in the urine)
bi(o)-	life	biocide (a substance which kills living organisms)
blast- or -blast	embryonic state	blastocyst (an early stage in the development of an embryo)
blephar(o)-	eyelid	blepharitis (inflammation of the eyelid)
brachi(o)-	arm	brachialis muscle (a muscle that causes the elbow to bend)

brady-	slow	bradypnoea (unusually slow breathing)

8.21.3 C – Medical Root Words

Roots	Meanings	Examples (Definitions)
calc(i)	heel	calcaneus (the heel bone situated underneath the talus)
carcin(o)-	cancer	carcinogen (a substance which produces a carcinoma or cancer)
cardi(o)-	heart	cardiopathy (any kind of heart disease)
caud-	tail	caudal (toward the tail)
cephal(o)-	head	cephalalgia (pain in the head)
cerebr(o)-	cerebrum	cerebrospinal (referring to the brain and the spinal cord)
chem(o)-	chemical	chemotherapy (treatment with chemicals)
chol(e)-	bile	cholecystitis (acute or chronic inflammation of the gallbladder, causing severe abdominal pain)
chondr(o)-	cartilage	chondritis (inflammation of a cartilage)
col(i)(o)-	colon	colitis (inflammation of the colon)
cost(o)-	rib	costalgia (pain around the chest due to damage to a rib or to one of the intercostal nerves beneath the ribs)
cut-	skin	cutaneous (relating to the skin)
cyan(o)-	blue	cyanosis (a bluish coloration of the skin or mucous membranes due to too much deoxygenated haemoglobin in the blood)
cyst(i)(o)-	bladder	cystitis (inflammation of the urinary bladder, which makes someone pass water often and with a burning sensation)
cyt(o)-	cell	cytodiagnosis (diagnosis after examination of cells)

8.1.4 D – Medical Root Words

Roots	Meanings	Examples (Definitions)
derm- or -derm	skin	dermatitis (inflammation of the skin)
dors(i)(o)-	back	dorsum (the back of any part of the body)

8.1.5 E – Medical Root Words

Roots	Meanings	Examples (Definitions)
encephal(o)-	brain	encephaloma (a tumour of the brain)

enter(o)-	intestine	enterocolitis (inflammation of the colon and small intestine)
erythr(o)-	red	erythrocytes (a mature red blood cell)

8.1.6 F – Medical Root Words

Roots	Meanings	Examples (Definitions)
fasci-	bundle	fasciae (bundles of muscle fibers)
febri-	fever	febrile (feverish or related to fever, as in febrile convulsions)
fil-	threadlike	filariasis (a tropical disease caused by parasitic threadworms in the lymph system, transmitted by mosquito bites)

8.1.7 G – Medical Root Words

Roots	Meanings	Examples (Definitions)
galact(o)-	milk	galactorrhoea (the excessive production of milk)
gastro-	stomach	gastritis (inflammation of the stomach)
ger(o)- or geront(o)-	aging	gerontology (study of aging)
gloss(o)(a)-	tongue	glossitis (inflammation of the surface of the tongue)

8.1.8 H – Medical Root Words

Roots	Meanings	Examples (Definitions)
haeme(a)(o)- or haemato-	blood	haematology (the scientific study of blood, its formation and its diseases)
hepat(o)-	liver	hepatitis (inflammation of the liver through disease or drugs)
hist(i)(o)-	tissue	histogenesis (the formation and development of tissue from the embryological germ layer)
hydro-	water	hydrorrhoea (a discharge of watery fluid)

hyster(o)-	uterus	hysterotomy (a surgical incision into the uterus, as in caesarean section or for some types of abortion)

8.1.9 I – Medical Root Words

Roots	Meanings	Examples (Definitions)
ile(o)-	ileum	ileostomy (a surgical operation to make an opening between the ileum and the abdominal wall to act as an artificial opening for excretion of faeces)
ischi(o)-	hip	ischiopubic (pertaining to the ischium and pubes)

8.1.10 J – Medical Root Words

Root	Meaning	Example (Definition)
jejun(o)-	jejunum	jejunectomy (a surgical operation to cut into the jejunum)

8.1.11 K– Medical Root Words

Roots	Meanings	Examples (Definitions)
kerat(o)-	horny tissue, cornea	keratoma (a hard-thickened growth due to hypertrophy of the horny zone of the skin)
kine(t)(o)-	movement	kinesiology (the study of human movements, particularly with

8.1.12 L – Medical Root Words

Roots	Meanings	Examples (Definitions)
labio-	lips, labia	labioplasty (a surgical operation to repair damaged or deformed lips)
lact(o)-	milk	lactose (a type of sugar found in milk)
laryng(o)-	larynx	laryngology (the study of diseases of the larynx, throat and vocal cords)
leuk(o)-	white	leukocytes (a white blood cell which contains a nucleus but has no haemoglobin)
lip(o)-	fat	lipoma (a benign tumour formed of fatty tissue)
lith(o)-	stone	litholapaxy (the evacuation of pieces of a stone in the bladder after crushing it with a lithotrite)

8.1.13 M – Medical Root Words

Roots	Meanings	Examples (Definitions)
mamm(o)-	breast	mammoplasty (plastic surgery to alter the shape or size of the breasts)
mast(o)-	breast	mastectomy (the surgical removal of a breast)
melan(o)-	black	melanoma (a tumour formed of dark pigmented cells)
meno-	menses	menorrhagia (very heavy bleeding during menstruation)
my(o)-	muscle	myocele (a condition in which a muscle pushes through a gap in the surrounding membrane)
myc(o)-	fungus	mycosis (any disease caused by a fungus, e.g. athlete's foot)
myel(o)-	bone marrow, spinal cord	myelocyte (a cell in bone marrow which develops into a granulocyte)
myx	mucus	myxoma (a benign tumour of mucous tissue, usually found in subcutaneous tissue of the limbs and neck)

8.1.14 N– Medical Root Words

Roots	Meanings	Examples (Definitions)
nas(o)-	nose	nasosinusitis (a condition in which the nose and sinuses swell up)
nephr(o)-	kidney	nephrolithiasis (a condition in which stones form in the kidney)
neur(o)-	nerve or nervous system	neurohormone (a hormone produced in some nerve cells and secreted from the nerve endings)

8.1.15 O – Medical Root Words

Roots	Meanings	Examples (Definitions)
ocul(o)-	eye	oculoplethysmography (measurement of the pressure inside the eyeball)
onc(o)-	tumor (cancerous)	oncogene (a part of the genetic system which causes malignant tumours to develop)

ophthalm(o)-	eye	ophthalmoplegia (paralysis of the muscles of the eye)
orchi(o)-	testes	orchitis (inflammation of the testes, characterised by hypertrophy, pain and a sensation of weight)
Oro	mouth	oropharynx (a part of the pharynx below the soft palate at the back of the mouth)
oste(o)-	bone	osteitis (inflammation of a bone due to injury or infection)
ot(o)-	ear	otorrhoea (the discharge of pus from the ear)

8.1.16 P – Medical Root Words

Roots	Meanings	Examples (Definitions)
paed- or ped(o)-	child	paediatrics (the study of children, their development and diseases.)
path(o)-	disease	pathogen (microorganism which causes a disease)
pharmaco	drugs	pharmacokinetics (the study of how the body reacts to drugs over a period of time)
pharyng(o)-	pharynx	pharyngitis (sore throat)
phleb(o)-	vein	phlebolith (a stone which forms in a vein as a result of an old thrombus becoming calcified)
phot(o)-	light	photopsia (a condition of the eye in which someone sees flashes of light)
plasm(o)-	liquid part of blood	plasminogen (a substance in blood plasma which becomes activated and forms plasmin)
pleur(o)-	pleura, rib, side	pleurisy (inflammation of the pleura)
pneum(o)-	lung	pneumonia (inflammation of a lung, where the tiny alveoli of the lung become filled with fluid)
pod(o)-	foot	podiatry (the study of minor diseases and disorders of the feet)
proct(o)-	anus or rectum	proctoclysis (the introduction of a lot of fluid into the rectum slowly)
psych(o)-	mind	psychiatry (study and treatment of mental disorders)
pyel(o)-	kidney	pyelotomy (a surgical operation to make an opening in the pelvis of the kidney)
pyr(o)-	burning or fever	pyrogen (a substance which causes fever)

8.1.17 R – Medical Root Words

Roots	Meanings	Examples (Definitions)
ren(o)-	kidney	renography (an examination of a kidney after injection of a radioactive substance, using a gamma camera)
rhin(o)-	nose	rhinoplasty (plastic surgery to correct the appearance of the nose)

8.1.18 S – Medical Root Words

Roots	Meanings	Examples (Definitions)
sarc(o)-	flesh	sarcoma (a highly malignant tumour made of connective tissue cells)
scler(o)-	hard	scleroma (a patch of hard skin or hard mucous membrane)
soma- or somat(o)-	body	somatization (psychiatric condition expressed through physical symptoms)
sten(o)-	narrow	stenosis (a condition in which a passage becomes narrow)

8.1.19 T – Medical Root Words

Roots	Meanings	Examples (Definitions)
tachy	Rapid, fast	tachyarrhythmia (a fast irregular heartbeat)
therm(o)-	heat	thermoanaesthesia (a condition in which someone cannot tell the difference between hot and cold)
thorac(o)-	chest	thoracotomy (a surgical operation to remove one or more ribs)
thromb(o)-	clot	thromboangiitis (a condition in which the blood vessels swell and develop blood clots along their walls)
trache(o)-	trachea	tracheobronchitis (inflammation of both the trachea and the bronchi)

8.1.20 U – Medical Root Words

Root	Meaning	Example (Definition)
ur(o)-	urinary, urine	urochesia (the passing of urine through the rectum, due to injury of the urinary system)

8.1.21 V – Medical Root Words

Roots	Meanings	Examples (Definitions)
vas(o)-	Vessel, vas deferens	vasopressor (a substance which increases blood pressure by narrowing the blood vessels), vasoligation (a surgical operation to tie the vasa deferentia to prevent infection entering the epididymis from the urinary system)
ven(i)(o)-	vein	venoclysis (the procedure of slowly introducing a saline or other solution into a vein)
vesic(o)-	bladder	vesicospinal (pertaining to the urinary bladder and spine)

8.2 Most Common Prefixes and suffixes

Prefix	Meaning	Key Word
anti-	against	antifreeze
de-	opposite	defrost
dis-*	not, opposite of	disagree
en-, em-	cause to	encode, embrace
fore-	before	forecast
in-, im-	in	infield
in-, im-, il-, ir-*	not	injustice, impossible
inter-	between	interact
mid-	middle	midway
mis-	wrongly	misfire
non-	not	nonsense
over-	over	overlook
pre-	before	prefix
re-*	again	return
semi-	half	semicircle
sub-	under	submarine
super-	above	superstar

trans-	across	transport
un-*	not	unfriendly
under-	under	undersea

Suffix	Meaning	Key word
-able, -ible	can be done	comfortable
-al, -ial	having characteristics of	personal
-ed*	past-tense verbs	hopped
-en	made of	wooden
-er	comparative	higher
-er,	one who	worker, actor
-est	comparative	biggest
-ful	full of	careful
-ic	having characteristics of	linguistic
-ing*	verb form/ present participle	running
-ion, -tion, -ation, ition	act, process	occasion, attraction
-ity, -ty	state of	infinity
-ive, -ative, -itive	adjective form of a noun	plaintive
-less	without	fearless
-ly*	characteristic of	quickly
-ment	action or process	enjoyment
-ness	state of, condition of	kindness
-ous, -eous, -ious	possessing the qualities of	joyous
-s, -es*	more than one	books, boxes
-y	characterized by	happy

8.3 Common abbreviations:

ANM	:	Auxiliary Nurse Midwife
APL	:	Above Poverty Line
ARSH	:	Adolescent Reproductive And Sexual Health
ASHA	:	Accredited Social Health Activist
BCC	:	Behavior Change Communication
BPL	:	Below Poverty Line
BPMU	:	Block Programme Management Unit
CH	:	Child Health
CHC	:	Community Health Care
DC	:	Disease Control
DP	:	Development Partner
DPMU	:	District Programme Management Unit
FP	:	Family Planning
FRU	:	First Referral Unit
GoI	:	Government Of India
HMIS	:	Health Management Information System
HPD	:	High Priority District
HR	:	Human Resources
HRD	:	Human Resource Development
IEC	:	Information, Education and Communication
JSSK	:	Janani Shishu Suraksha Karyakram

JSY	:	Janani Suraksha Yojana
M&E	:	Monitoring & Evaluation
MAS	:	MahilaArogya Samiti
MCD	:	Municipal Corporation Department
MH	:	Maternal Health
MMU	:	Mobile Medical Unit
MOHFW NHM	: :	Ministry Of Health & Family Welfare National Health Mission
NGO	:	Non Government Organization
NLEP	:	National Leprosy Eradication Programme
NPCC	:	National Programme Coordination Committee
NPCDCS NPCB NMHP NOHP NPPC NPPMBI NPPCF	: : : :	National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke National Programme for Control of Blindness National Mental Health Programme National Oral Health Programme National Programme for Palliative Care National Programme for Prevention and Management of Burn Injuries National Programme for Prevention and Control of Fluorosis
NRHM	:	National Rural Health Mission
RNTCP	:	Revised National Tuberculosis Control Program
NUHM	:	National Urban Health Mission
NVBDCP	:	National Vector Borne Disease Control Programme
OPD	:	Out Patient Department
PHC	:	Primary Health Centre
PIP	:	Program Implementation Plan
PRI	:	Panchayati Raj Institution
RBSK	:	Rashtriya Baal Swasthya Karyakram
RCH		Reproductive Child Health
RKS	:	Rogi Kalyan Samiti

RMNCH+A	:	Reproductive Maternal Neonatal Child Health + Adolescent
ROP	:	Record of Proceedings
SC/ST	:	Scheduled Castes/Scheduled Tribals
SHC	:	Sub Health Centre
SHS	:	State Health Systems
SHSRC	:	State Health Systems Resource Centre
SIHFW	:	State Institute of Health and Family Welfare
SPMU	:	State Programme Management Unit
SRS	:	Sample Registration System
AHS	:	Annual Health Survey
DLHS	:	District Level House Hold Survey
NFHS	:	National Family Health Survey
HMIS	:	Health Management Information System
MCTS	:	Mother and Child Tracking System
IDSP	:	Integrated Disease Surveillance Programme
TFR	:	Total Fertility Rate
UH	:	Urban Health
ULB	:	Urban Local Body
UPHC	:	Urban Primary Health Centre
VHSNC	:	Village Health Sanitation and Nutrition Committee

8.4 SUMMARY

The root of a word is the foundation of a medical term and provides the general meaning of the word. It can be a whole word or part of a word. Medical root words come from many different languages (e.g., Greek, Latin, Arabic, French, and German) and find their way into English. Some commonly used medical root words in their combining form.

8.5 KEY WORDS: ROOT WORD, PREFIXES, SUFFIXES,

Common Root: The root of a word is the foundation of a medical term and provides the general meaning of the word. It can be a whole word or part of a word. Medical root words come from many different languages (e.g., Greek, Latin, Arabic, French, and German) and find their way into English.

Prefixes: prefixes are located at the beginning of a medical term. The prefix alters the meaning of the medical term. It is important to spell and pronounce prefixes correctly.
Suffixes: suffixes are word parts that are located at the end of words. Suffixes can alter the meaning of medical terms. It is important to spell and pronounce suffixes correctly.

8.6 SELF-ASSESSMENT QUESTIONS

1) Define root word also explain diffident types of root words used in hospital
2) Explain different types of common Abbreviations used in Hospital
3) Explain different Common prefixes and suffixes in medical profession.

8.7 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-9

DEPARTMENTS
TIME, GENERAL HEALTHCARE, ROUTES OF MEDICATION AND LABORATORY; SYMBOLS.

OBJECTIVES:

- To know the list of department in Hospital
- To understand clinical and non-clinical departments in hospital
- To know the role of Nutrition in hospital
- To understand the types of Laboratories in hospital
- To study the ENT
- To know the process of Hospital Accreditation

STRUCTURE

9.1 INTRODUCTION

A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. Hospital is having many departments includes

9.2 List of Departments

- Operating Department (Operation theatres)
- Accident & Emergency
- Anaesthesia & Intensive Care
- Biochemistry
- Blood Bank
- Burn Plastic & Maxillofacial
- Cardiology Department
- Cardiothoracic & Vascular Surgery (CTVS)
- CRITICAL CARE MEDICINE (CCM)
- Central Sterile Supply Department (CSSD)
- Dental Department
- Dermatology
- Endocrinology & Metabolism
- ENT Department
- Gastroenterology
- Gynaecology & Obst. Department
- Medical Records
- Microbiology
- Medicine Department
- Neonatology
- Nephrology
- Neurology
- Neurosurgery
- Nursing Department
- Orthopaedics Department
- Pathology
- Paediatrics Surgery
- Paediatrics, Neonatology & Adolescent Medicine
- Physical Medicine & Rehabilitation
- Physiotherapy
- Psychology (clinical)
- Psychiatry, Drug de-addiction and Regional Centre for Tobacco control
- Radiology Department
- Respiratory Medicine
- Surgery
- Urology and Renal Transplant

9.2.1 Admissions department:

At the admission department the patient will be required to provide personal information and sign consent forms before being taken to the hospital unit or ward. If the individual is critically ill, then this information is usually obtained from family members.

9.2.2 ***Operating department*** *(operation theatre):*

An operating theatre, also known as an operating theatre (OT), operating room (OR) or operating suite, is a facility within a hospital where surgical operations are carried out in a sterile environment. Historically, the term "operating theatre" referred to a non-sterile, tiered theatre or amphitheatre in which students and other spectators could watch surgeons perform surgery.

9.2.3 Operation Theatre (OT) Design:

Operating rooms are spacious, easy to clean, and well-lit, typically with overhead surgical lights, and may have viewing screens and monitors. Operating rooms are generally windowless and feature controlled temperature and humidity. Special air handlers filter the air and maintain a slightly elevated pressure. Electricity support has backup systems in case of a black-out.

Rooms are supplied with wall suction, oxygen, and possibly other, anesthetic gases. Key equipment consists of the operating table and the anesthesia cart. In addition, there are tables to set up instruments. There is storage space for common surgical supplies. There are containers for disposables. Outside the operating room is a dedicated scrubbing area that is used by surgeons, anesthetists, technicians and nurses prior to surgery.

Several operating rooms are part of the operating suite that forms a distinct section within a health-care facility. Besides the operating rooms and their wash rooms, it contains rooms for personnel to change, wash, and rest, preparation and recovery rooms(s), storage and cleaning facilities, offices, dedicated corridors, and possibly other supportive units. In larger facilities, the operating suite is climate- and air-controlled, and separated from other departments so that only authorized personnel have access.

9.2.4 Important aspects in designing an OT

- ✓ Promotes high standard of asepsis.
- ✓ Ensures maximum standard of safety.
- ✓ Optimises utilization of OT and staff time.
- ✓ Optimises working conditions.
- ✓ Patient & staff comfort in terms of thermal, acoustic and lighting requirements.
- ✓ Allows flexibility.
- ✓ Facilitate coordinated services.
- ✓ Minimises maintenance.
- ✓ Ensures functional separation of spaces
- ✓ Regulates flow of traffic.
- ✓ Has all its Cavity and joints filled with epoxy to make an OT seamless.
- ✓ Is painted with anti - bacterial & fungal paint.
- ✓ Provides soothing environment

9.3 Emergency Department:

An emergency department (ED), also known as an accident & emergency department (A&E), emergency room (ER) or casualty department, is a medical treatment facility specializing in emergency medicine, the acute care of patients who present without prior appointment; either by their own means or by that of an ambulance. The emergency department is usually found in a hospital. Due to the unplanned nature of patient attendance, the department must provide initial treatment for a broad spectrum of illnesses and injuries, some of which may be life threatening and require immediate attention. In some countries, emergency departments have

become important entry points for those without other means of access to medical care. The emergency departments of most hospitals operate 24 hours a day, although staffing levels may be varied in an attempt to reflect patient volume.

9.4 Clinical Laboratory Department:

A medical laboratory or clinical laboratory is a laboratory where tests are done on clinical specimens in order to get information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease. Laboratory medicine is generally divided into two sections, each of which being subdivided into multiple units. These two sections are:

Anatomic pathology: Units included here are histopathology, cytopathology, and electron microscopy. Academically, each unit is studied alone in one course. Other courses pertaining to this section include anatomy, physiology, histology, pathology, and pathophysiology.

Clinical pathology: It includes •

- **Clinical Microbiology**: This encompasses five different sciences (units). These include bacteriology, virology, parasitology, immunology, and mycology.
- **Clinical Chemistry**: Units under this busy section include instrumental analysis of blood components, enzymology, toxicology and endocrinology.
- **Hematology:** This section consists of automated and manual analysis of blood cells. It includes two subunits, which are coagulation and blood bank.
- Genetics is also studied along with a subspecialty known as cytogenetics.
- **Reproductive biology**: Semen analysis, Sperm bank and assisted reproductive technology.

9.5 **Central Sterile Services Department (CSSD)**:

(Sterile Processing Department (SPD) - Sterile Processing - Central Supply Department (CSD) - Central Supply) - A place in hospitals and other health care facilities that performs sterilization and other actions on medical equipment, devices, and consumables.

9.6 Finance Department:

it performs all works related to budget and ideal use of the items of such budget. Also, it prepares payrolls and monthly wages and concludes contracts of operation and maintenance and purchases. In addition, it makes available all amount of money required for procurement of all materials and equipment.

9.7 Intensive Care Unit (ICU):

(Intensive Therapy Unit, Intensive Treatment Unit (ITU), Critical Care Unit (CCU) - A special department of a hospital or health care facility that provides intensive treatment medicine and caters to patients with severe and life-threatening illnesses and injuries, which require constant, close monitoring and support from specialist equipment and medications.

9.8 Nutrition and Dietetics:

Dieticians and nutritionists provide specialist advice on diet for hospital wards and outpatient clinics.

9.9 ENT Department:

The ENT Department provide comprehensive and specialized care covering both Medical and surgical conditions related not just specifically to the Ear, Nose and Throat, but also other areas within the Head and Neck region. It is often divided into sub-specialties dealing with only one part of the traditional specialty (ontology, rhinology and laryngology).

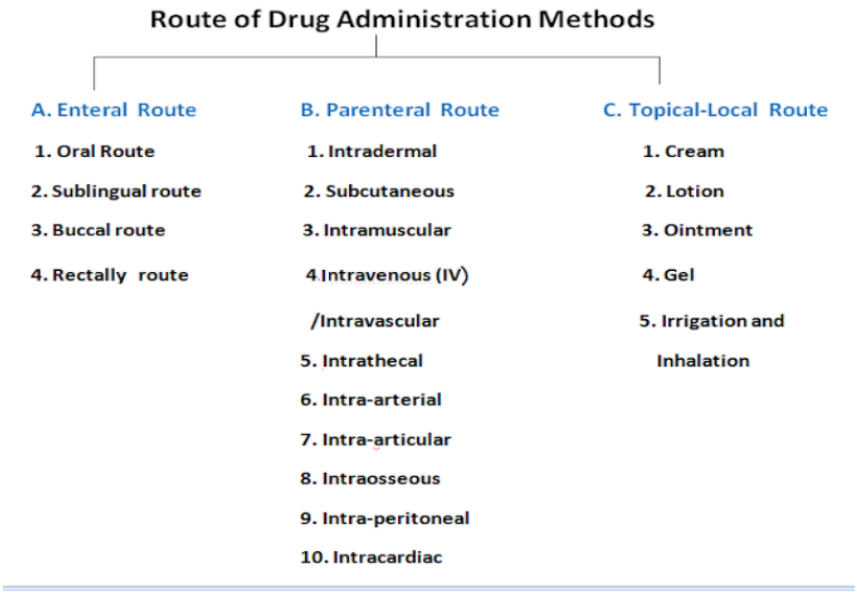
9.10 Rheumatology:
Rheumatologists care for and treat patients for musculoskeletal disorders such as: bones, joints, ligaments, tendons, muscles and nerves.

9.11 Cardiology:
Provides Medical healthcare to the patients who have problems with their heart or circulation.

9.12 Medication:
A dosage form that contains one or more active and/or inactive ingredients. Medications come in many dosage forms, including tablets, capsules, liquids, creams, and patches. They can also be given in different ways, such as by mouth, by infusion into a vein, or by drops that are put into the ear or eye. The form with the active ingredient is used to prevent, diagnose, treat, or relieve symptoms of a disease or abnormal condition. A medication that does not contain an active ingredient and is used in research studies is called a placebo. Also called drug product.

Techniques involved in each route of medication administration are different, and some of the important points are summarized as follows:

- Intravenous Route. ...
- Intramuscular Route. ...
- Subcutaneous Route. ...
- Rectal Route. ...
- Vaginal Route. ...
- Inhaled Route.



9.13 Laboratory:

Introduction: A medical laboratory or clinical laboratory is a laboratory where tests are done on clinical specimens in order to get information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease.

Laboratory medicine is generally divided into two sections, each of which being subdivided into multiple units. These two sections are:

9.13.1 Anatomic pathology:

Units included here are histopathology, cytopathology, and electron microscopy. Academically, each unit is studied alone in one course. Other courses pertaining to this section include anatomy, physiology, histology, pathology, and pathophysiology.

9.13.2. Clinical pathology: It includes

- **Clinical Microbiology**: This encompasses five different sciences (units). These include bacteriology, virology, parasitology, immunology, and mycology.
- **Clinical Chemistry**: Units under this busy section include instrumental analysis of blood components, enzymology, toxicology and endocrinology.
- **Hematology** : This section consists of automated and manual analysis of blood cells. It includes two subunits, which are coagulation and blood bank.
- Genetics is also studied along with a subspecialty known as cytogenetics.
- **Reproductive biology**: Semen analysis, Sperm bank and assisted reproductive technology.

9.14 RESPONSIBILITIES OF EACH UNIT

1. **Microbiology**: It receives almost any clinical specimen, including swabs, feces, urine, blood, sputum, cerebrospinal fluid, synovial fluid, as well as possible infected tissue. The work here is mainly concerned with cultures, to look for suspected pathogens which, if found, are further identified based on biochemical tests. Also, sensitivity testing is carried out to determine whether the pathogen is sensitive or resistant to a suggested medicine. Results are reported with the identified organism(s) and the type and amount of drug(s) that should be prescribed for the patient.
2. **Parasitology**: It is a microbiology unit that investigates parasites. The most frequently encountered specimen here is faeces. However, blood, urine, sputum, and other samples may also contain parasites.
3. **Virology**: It is concerned with identification of viruses in specimens such as blood, urine, and cerebrospinal fluid.
4. **Hematology**: It works with whole blood to do full blood counts, and blood films as well as many other specialised tests. Coagulation requires citrated blood samples to analyze blood clotting times and coagulation factors.
5. **Clinical Biochemistry**: It usually receives serum or plasma. They test the serum for chemicals present in blood. These include a wide array of substances, such as lipids, blood sugar, enzymes, and hormones.
6. **Toxicology**: Here mainly tests for pharmaceutical and recreational drugs. Urine and blood samples are submitted to this lab.
7. **Immunology/Serology:** The concept of antigen-antibody interaction as a diagnostic tool is used here. Compatibility of transplanted organs is also determined.
8. **Immunohaematology or Blood bank**: It determines blood groups, and performs compatibility testing on donor blood and recipients. It also prepares blood components,

derivatives, and products for transfusion. This unit determines a patient's blood type and Rh status, checks for antibodies to common antigens found on red blood cells, and cross matches units that are negative for the antigen.

9. **Urinalysis**: Here urine is tested for many analytes. Some health care providers have a urinalysis laboratory, while others don't. Instead, each component of the urinalysis is performed at the corresponding unit. If measuring urine chemicals is required, the specimen is processed in the clinical biochemistry lab, but if cell studies are indicated, the specimen should be submitted to the cytopathology lab, and so on.
10. **Histopathology**: This lab processes solid tissue removed from the body (biopsies) for evaluation at the microscopic level. • Cytopathology: This lab examines smears of cells from all over the body (such as from the cervix) for evidence of inflammation, cancer, and other conditions.
11. **Electron microscopy**: It prepares specimens and takes micrographs of very fine details. • Genetics: It mainly performs DNA analysis.
12. **Cytogenetics**: It involves using blood and other cells to get a karyotype. This can be helpful in prenatal diagnosis (e.g. Down's syndrome) as well as in cancer (some cancers have abnormal chromosomes).
13. Surgical pathology: This lab examines organs, limbs, tumors, fetuses, and other tissues biopsied in surgery such as breast lumps.

9.15 Laboratory Staff: The staff of clinical laboratories may include:

1. Pathologist
2. Clinical Biochemist
3. Pathologists' Assistant(PA)
4. Medical Laboratory Technician (MLT)
5. Medical Laboratory Assistant (MLA)

9.16 Types of Laboratories

There are two main types of labs that process the majority of medical specimens.

1. Hospital laboratories are attached to a hospital, and perform tests on patients.

2. Private laboratories receive samples from general practitioners, insurance companies, clinical research sites and other health clinics for analysis.

Reference laboratories: There are also reference laboratories where more unusual and obscure tests are performed.

Research laboratories: For extremely specialised tests, samples may go to a research laboratory.

There are mainly three types of Medical Laboratories as per the types of investigations carried out.

• **Clinical Pathology**: Haematology, Histopathology, Cytology, Routine Pathology

• **Clinical Microbiology** : Bacteriology, Mycobacteriology, Virology, Mycology, Parasitology, Immunology, Serology

• **Clinical Biochemistry**. Biochemical analysis, Hormonal assays

General end-User Considerations in laboratories:

- Efficient collection and transportation methods for specimens
- Access to state-of-the-art diagnostic equipment and resources
- Quality control and accuracy of diagnostic tests being performed
- Efficiency of tasks performed including budget consciousness
- Safety including reduction of exposure to bio-hazardous waste

9.17 Functional Areas of Laboratories

Not all laboratory configurations will be the same. Depending on the nature of the work being performed, labs will have specific requirements for personnel, equipment and case work. All hospital labs will generally fall under one of the following categories.

❖ ***Specimen Control****:* This is the central communication hub for all of the other hospital laboratories. This is the point of origin and as well as the final collection point for all data calculated during testing. This area will include multiple computer workstations to both examine and catalog findings and to record physician's notes and patient chart information.

❖ ***Blood Draw*****:** When hospital outpatients require testing they will initially have their blood sample taken in this area. From here samples are distributed by a Phlebotomist for testing.

❖ ***Chemistry***: The chemistry lab performs a variety of different functions but is generally concerned with the analysis and composition of bodily tissues, fluids, and secretions

❖ ***Toxicology*****:** Blood samples are analyzed in the toxicology/chemistry lab to identify and measure specific substances found in the body. The level of narcotics, prescriptions, and other foreign substances found in the body are all recorded by the Toxicologist.

❖ ***Urinalysis***: Patient urine samples are received, prepared, and analyzed in the urinalysis lab.

❖ ***Hematology***: Further testing of blood samples is performed in the hematology lab. Here technicians determine cell counts, identify types of white cells, and research any cell abnormalities.

❖ ***Blood Bank***: The blood bank is the primary storage and preparation area for transfusion materials. This lab will analyze, categorize, and administer various blood samples for transfusions.

❖ ***Immunology***; The immunology lab will perform a variety of tests concerning the human immune system in order to prepare patients for defense and to discover causes of diseases.

❖ ***Microbiology****;* In the microbiology lab specimens are tested for specific disease causing microorganisms including bacteria, fungi, viruses, parasites, and protozoa.

❖ ***Pathology***: Specimens are sent from surgery or the autopsy rooms to the pathology department. Here characteristics such as shape, size, and weight are examined and recorded.

❖ ***Histology***: After specimens have been examined by the Pathologist they are sent to the histology lab. Here slides are prepared so that specimens may be examined microscopically.

❖ ***Cytology***: The cytology department also prepares and analyzes microscope slides but is more concerned with research and discovery of cancerous cell tissue. Pap smear tests will be the primary procedure performed in the cytology department.

❖ ***Satellite Labs****:* As with other hospital departments including pharmacies and nurse stations, laboratories may also be decentralized to increase overall hospital efficiency and to facilitate the execution of STAT orders and testing. These quick response labs will generally support one or more of the following areas:

- Surgery
- Critical Care Units
- Emergency Rooms
- Radioimmunoassay (RIA)
- Off-Site Clinics

9.18 Specimen processing and work flow:

Sample processing will usually start with a set of samples and a request form. Typically a set of vacutainer tubes containing blood, or any other specimen, will arrive to the laboratory in a small plastic bag, along with the form.

The form and the specimens are given a laboratory number. The specimens will usually all receive the same number, often as a sticker that can be placed on the tubes and form. For biochemistry samples, blood is usually centrifuged and serum is separated. If the serum needs to go on more than one machine, it can be divided into separate tubes.

Many specimens end up in one or more sophisticated automated analysers, which process a fraction of the sample and return one or more "results". Some laboratories use robotic sample handlers (Laboratory automation) to optimize the workflow and reduce contamination risk and sample handling of the staff.

Laboratory information system (LIS): Laboratories today are held together by a system of software programs and computers that exchange data about patients, test requests, and test results known as a Laboratory information system or LIS. The LIS is interfaced with the hospital information system.

This system enables hospitals and labs to order the correct test requests for each patient, keep track of individual patient or specimen histories, and help guarantee a better quality of results as well as printing hard copies of the results for patient charts and doctors to check.

Result analysis, validation and interpretation: All pathological results must be verified by a competent professional. Abnormal results are referred to the relevant pathologist.

9.19 ACCREDITATION:

Credibility of medical laboratories is paramount to the health and safety of the patients relying on the testing services provided by these labs. The international standard in use today for the accreditation of medical laboratories is ISO 15189 (Medical laboratories - particular requirements for quality and competence). The accrediting body in India is NABL. Accreditation is an obligation for all clinical laboratories.

9.20 Summary: A hospital is a health care institution providing patient treatment with specialized medical and nursing staff and medical equipment. Hospital is having many departments includes Clinical and Non clinical departments, every department has its important role for the functioning of the Hospital.

9.21 Key Words: Operation Theatre, ER CSSD, ENT, Cardiology Laboratory

Operation theatre: An operating theatre, also known as an operating theatre (OT), operating room (OR) or operating suite, is a facility within a hospital where surgical operations are carried out in a sterile environment.
Emergency Department : An emergency department (ED), also known as an accident & emergency department (A&E), emergency room (ER) or casualty department, is a medical treatment facility specializing in emergency medicine, the acute care of patients who present without prior appointment; either by their own means or by that of an ambulance.
CSSD (Central Sterile Supply Department): A place in hospitals and other health care facilities that performs sterilization and other actions on medical equipment, devices, and consumables.
ENT: The ENT Department provide comprehensive and specialized care covering both Medical and surgical conditions related not just specifically to the Ear, Nose and Throat, but also other areas within the Head and Neck region.
Cardiology: Provides Medical healthcare to the patients who have problems with their heart or circulation.
Laboratory: A medical laboratory or clinical laboratory is a laboratory where tests are done on clinical specimens in order to get information about the health of a patient as pertaining to the diagnosis, treatment, and prevention of disease.

9.22 Self-Assessment Questions

1) What are the various departments in Hospital Functioning?
2) List out Non Clinical Departments and its importance in Hospital?
3) Explain the importance of the CSSD in Hospital
4) Give an overview of Laboratory service in Hospitals
5) Explain the role of medication

9.23 Suggested for Further Readings

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

MBA Hospital Administration	151	Medical Terminology, Clinical...

LESSON-10

SPECIALITY-WISE TERMINOLOGY

OBJECTIVES

- To understand what is Medical speciality
- To know the various List of speciality services in Hospital
- To understand the clinical pathology
- To know different type in pathology
- To understand clinical, diagnostic and therapeutic term sused in hospital

STRUCTURE

10.1 INTRODUCTION TO MEDICAL SPECIALTY

Medical speciality is a branch of medical practice that is focused on a defined group of patients, diseases, skills, or philosophy. Ex: children (paediatrics), cancer (oncology), laboratory medicine (pathology), or primary care (family medicine). After completing MBBS, doctors usually further their medical education in a specific specialty of medicine or surgery by completing a three year post graduate course to become a specialist. Medical specialties can be classified along several axes. These are:

- Surgical or Internal medicine
- Age range of patients (Paediatric, geriatric etc)
- Diagnostic or therapeutic
- Organ-based or technique-based (Nephrology, Cardiology etc)

The **surgical specialties** are those in which an important part of diagnosis and treatment is achieved through major surgical techniques.

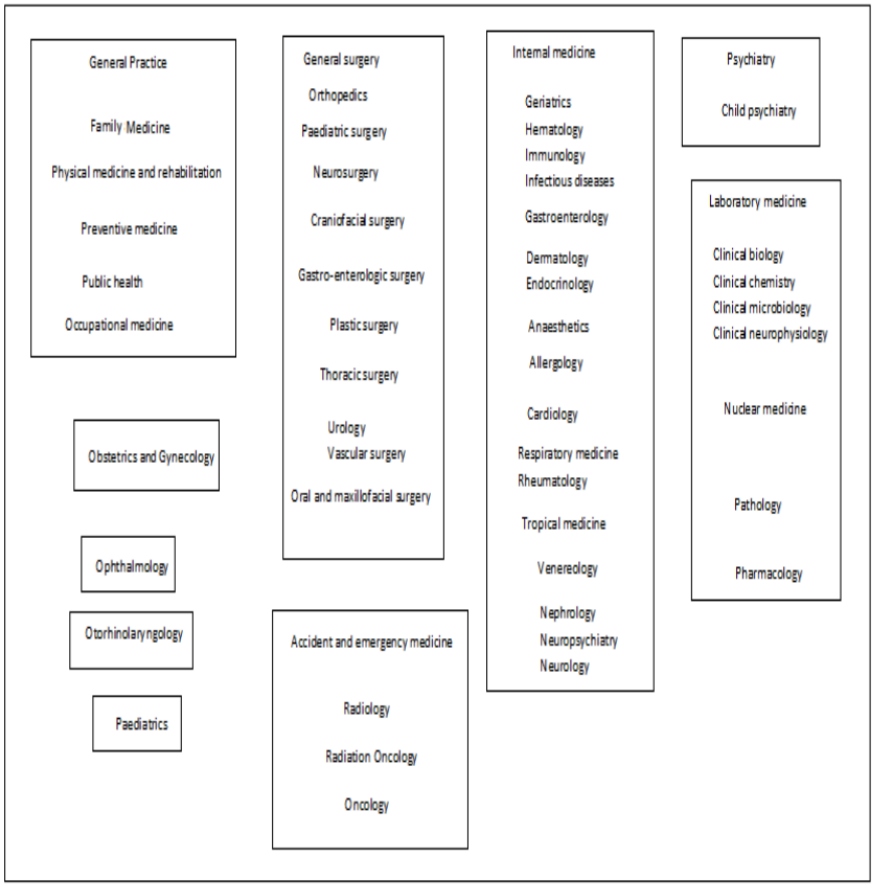
The **internal medicine specialties** are the specialties in which the main diagnosis and treatment is never major surgery. Though Anaesthesiology is vital in the surgical process, anesthesiologists never perform major surgery themselves.

Many specialties are **organ-based**. Many symptoms and diseases come from a particular organ. Others are based mainly around a **set of techniques**, such as radiology, which was originally based around X-rays.

The **age range of patients** seen by any given specialist can be quite variable. Pediatricians handle most complaints and diseases in children that do not require surgery, and there are several subspecialties (formally or informally) in paediatrics that mimic the organ-based specialties in adults. Paediatric surgery may or may not be a separate specialty that handles some kinds of surgical complaints in children.

A further subdivision is **the diagnostic versus therapeutic specialties**. While the diagnostic process is of great importance in all specialties, some specialists perform mainly or only diagnostic examinations, such as pathology, clinical neurophysiology, and radiology. This line is becoming somewhat blurred with interventional radiology, an evolving field that uses image expertise to perform minimally invasive procedures.

10.2 List of specialities:



10.3 Clinical laboratory sciences

- Transfusion medicine is concerned with the transfusion of blood and blood component, including the maintenance of a "blood bank".
- Cellular pathology is concerned with diagnosis using samples from patients taken as tissues and cells using histology and cytology.
- Clinical chemistry is concerned with diagnosis by making biochemical analysis of blood, body fluids, and tissues.
- Hematology is concerned with diagnosis by looking at changes in the cellular composition of the blood and bone marrow as well as the coagulation system in the blood.

- Clinical microbiology is concerned with the *in vitro* diagnosis of diseases caused by bacteria, viruses, fungi, and parasites.
- Clinical immunology is concerned with disorders of the immune system and related body defenses. It also deals with diagnosis of allergy.

10.4 PATHOLOGY

Pathology (from the Greek roots of pathos, meaning "experience" or "suffering", and -logia , "study of") is a significant component of the causal study of disease and a major field in modern medicine and diagnosis.
General pathology is a medical specialty that diagnoses disease through analysis of tissue, cell, and body fluid samples. Pathology can also refer to a disease condition and the affix path is sometimes used to indicate a state of disease example cardiomyopathy or psychopathy. A pathological condition is one caused by disease, rather than occurring physiologically. A physician practicing pathology is called a pathologist.
Pathology addresses four components of disease:

- cause/etiology,
- mechanisms of development (pathogenesis),
- structural alterations of cells (morphologic changes),
- consequences of changes (clinical manifestations)

10.5 Clinical pathology:

Clinical pathology is the diagnosis of disease through the laboratory analysis of bodily fluids and tissues. **Anatomical pathology** is a medical specialty that is concerned with the diagnosis of disease based on the gross, microscopic, chemical, immunologic and molecular examination of organs, tissues, and whole bodies (as in an autopsy). Anatomical pathology is itself divided into subfields, the main divisions being surgical pathology, cytopathology, and forensic pathology. The combination of both anatomical and clinical pathology is known as **general pathology.**

10.6 Cytopathology (cytology)

Cytology is a branch of pathology that studies free cells or tissue fragments to diagnose diseases like cancer etc. Cytopathology tests are sometimes called smear tests because the samples may be smeared across a glass microscope slide and stained for microscopic examination.

10.7 Dermatopathology

It is a subspecialty of anatomic pathology that focuses on the skin as an organ. A skin biopsy is taken to be examined under the microscope. Other tests done maybe immunofluorescence, immunohistochemistry, electron microscopy, flow cytometry etc.

10.8 Forensic pathology

Forensic pathology focuses on determining the cause of death by post-mortem examination of a corpse or partial remains. An autopsy is typically performed by a coroner or medical examiner.

10.9 Histopathology

Histopathology refers to the microscopic examination of various forms of human tissue. Specifically, in clinical medicine, histopathology refers to the examination of a biopsy or surgical specimen by a pathologist, after the specimen has been processed and histological sections have been placed onto glass slides. This contrasts with the methods of cytopathology, which uses free cells or tissue fragments. Histopathological examination of tissues starts with surgery, biopsy, or autopsy. The tissue is removed from the body of an organism and then placed in a fixative that stabilizes the tissues to prevent decay. The most common fixative is formalin, although frozen section fixing is also common. To see the tissue under a microscope, the sections are stained with one or more pigments. The aim of staining is to reveal cellular components; counter stains are used to provide contrast.

10.10 Neuropathology

Neuropathology is the study of disease of nervous system tissue, usually in the form of either surgical biopsies or sometimes whole brains in the case of autopsy. Neuropathology is a subspecialty of anatomic pathology, neurology, and neurosurgery.

10.11 Pulmonary pathology:

Pulmonary pathology is a subspecialty of anatomic pathology that deals with diagnosis and characterization of neoplastic (cancer) and non-neoplastic diseases of the lungs.

10.12 Renal Pathology

Renal pathology is a subspecialty of anatomic pathology that deals with the diagnosis and characterization of disease of the kidneys.

10.13 Surgical pathology

Surgical pathology is one of the primary areas of practice for most anatomical pathologists. Surgical pathology involves the gross and microscopic examination of surgical specimens, as well as biopsies submitted by surgeons

10.14 Hematopathology

Hematopathology is the study of diseases of blood cells (including constituents such as white blood cells, red blood cells, and platelets) and the tissues, and organs comprising the hematopoietic system. The term hematopoietic system refers to tissues and organs that produce and/or primarily host hematopoietic cells and includes bone marrow, the lymph nodes, thymus, spleen, and other lymphoid tissues.

10.15 Immunopathology

Immunopathology is a branch of clinical pathology that deals with an organism's immune response to a certain disease. When a foreign antigen enters the body, there is either an antigen specific or nonspecific response to it. These responses are the immune system fighting off the foreign antigens, whether they are deadly or not. Immunopathology could refer to how the foreign antigens cause the immune system to have a response or problems that can arise from an organism's own immune response on itself.

10.16 Radiation Pathology

It is study of the interaction between human tissues and radiation, as long as the problems and diseases that can arise from the use of radiation. When human tissue is exposed to radiation, it can be genetically altered and deformed; in turn, this could lead to a variety of illnesses that could be minor or deadly.

10.17 Clinical, diagnostic and therapeutic terms

10.17.1 Indication:

A disease, symptom, or particular set of circumstances that make a particular test, medication, procedure, or surgery advisable. For a treatment, an indication refers to the use of that treatment in treating a particular disease.

***10.17.2 Informed consent*:**

Its purpose is to protect the patient. If a person decides to take a particular treatment, he/ she will sign the informed consent form to acknowledge that they understand the details of the trial and consent to participating. The informed consent form is not a contract and the participant can withdraw from the treatment at any time, and for any reason. This information is also written in a document, known as the informed consent form, which is designed to be clear and easy to understand.

10.17.3 Placebo:

Placebos are inactive substances which are given for treating certain conditions which may not require medication.

10.17.4 Allergen:

An exogenous (foreign) antigen, usually a protein that is able to elicit an IgE antibody response and thus activate mast cells. Every allergen is a type of antigen, but not every antigen is an allergen.

Analgesic: A drug that relieves pain.

10.18 Therapy

A **therapy** or **medical treatment** is the attempted remediation of a health problem, usually following a medical diagnosis. As a rule, each therapy has indications and contraindications. There are many different types of therapy. Not all therapies are effective. Many therapies can produce unwanted adverse effects. Treatment and therapy are generally considered synonyms. However, in the context of mental health, the term therapy may refer specifically to psychotherapy.

Care, **therapy**, **treatment**, and **intervention:** The word care tends to imply a broad idea of everything done to protect or improve someone's health (for example, as in the terms preventive care and primary care, which connote ongoing action). It may also sometimes imply a narrower idea (for example, cases of wound care or post-anesthesia care). In contrast, the word intervention tends to be specific and concrete, and thus the word is often countable; for example, one instance of cardiac catheterization is one intervention performed, and coronary care can require a series of interventions.

10.19 Types of therapy: By chronology, priority, or intensity

Levels of care: classify health care into categories of chronology, priority, or intensity, as follows:

- **Emergency care** handles medical emergencies and is a first point of contact or intake for less serious problems, which can be referred to other levels of care as appropriate.
- **Intensive care**, also called **critical care**, is care for extremely ill or injured patients. It thus requires high resource intensity, knowledge, and skill, as well as quick decision making.

- **Ambulatory care** is care provided on an outpatient basis. Typically patients can walk into and out of the clinic under their own power (hence "ambulatory"), usually on the same day.
- **Home care** is care at home, including care from providers (such as physicians, nurses, and home health aides) making house calls, care from care givers such as family members, and patient self-care.
- **Primary care** is meant to be the main kind of care in general, and ideally a medical home that unifies care across referred providers.
- **Secondary care** is care provided by medical specialists and other health professionals who generally do not have first contact with patients, for example, cardiologists, urologists and dermatologists. A patient reaches secondary care as a next step from primary care, typically by provider referral although sometimes by patient self-initiative.
- **Tertiary care** is specialized consultative care, usually for inpatients and on referral from a primary or secondary health professional, in a facility that has personnel and facilities for advanced medical investigation and treatment, such as a tertiary referral hospital.
- **Follow-up care** is additional care during or after convalescence. Aftercare is generally synonymous with follow-up care.
- **End-of-life care** is care near the end of one's life. It often includes the following:
  - **Palliative care** is supportive care, most especially (but not necessarily) near the end of life.
  - **Hospice care** is palliative care very near the end of life when cure is very unlikely. Its main goal is comfort, both physical and mental.

10.20 Lines of therapy

Treatment options can often be ranked or prioritized into lines of therapy: first-line therapy, second-line therapy, third-line therapy, and so on.

First-line therapy (sometimes called **induction therapy**, **primary therapy**, or **front-line therapy**) is the first therapy that will be tried. Its priority over other options is usually either:

(1) Formally recommended on the basis of clinical trial evidence for its best-available combination of efficacy, safety, and tolerability or

(2) Chosen based on the clinical experience of the physician.

If a first-line therapy either fails to resolve the issue or produces intolerable side effects, additional (second-line) therapies may be substituted or added to the treatment regimen, followed by third-line therapies, and so on.

An example is chemotherapy regimens. Because of the great difficulty in successfully treating some forms of cancer, one line after another may be tried.

Often multiple therapies may be tried simultaneously (**combination therapy** or poly therapy). Thus **combination chemotherapy** is also called poly-chemotherapy, whereas chemotherapy with one agent at a time is called single-agent therapy or monotherapy.

Adjuvant therapy is therapy given in addition to the primary, main, or initial treatment, but simultaneously (as opposed to second-line therapy).

Neoadjuvant therapy is therapy that is begun before the main therapy. Thus one can consider surgical excision of a tumor as the first-line therapy for a certain type and stage of cancer even though radiotherapy is used before it; the radiotherapy is neo adjuvant (chronologically first but not primary in the sense of the main event).

10.21 By intent

Curative therapy: A therapy with *curative intent*, that is, one that seeks to cure the root cause of a disorder.

Definitive therapy: A therapy that may be final, superior to others, curative, or all of those.

Empirical Therapy: A therapy given on an empiric basis; that is, one given according to a clinician's educated guess despite uncertainty about the illness's causative factors. For example, empiric antibiotic therapy administers abroad-spectrum antibiotic immediately

Investigational Therapy: An experimental therapy.

Preventive or Prophylactic therapy: therapy that is intended to prevent a medical condition from occurring (also called prophylaxis). For example, many vaccines prevent infectious diseases.

10.22 Supportive therapy:

A therapy that does not treat or improve the underlying condition, but instead increases the patient's comfort, also called symptomatic treatment(see there for more information)

Systemic therapy: Therapy that is systemic. In the physiological sense, this means affecting the whole body (rather than being local or loco regional).

10.23 By the method of treatment:

- By drugs: pharmacotherapy, chemotherapy
- By medical devices: implantation
- by specific molecules: molecular therapy
- by specific chemical elements: heavy metals like gold – aurotherapy, by biometals like lithium: lithium therapy
- by non metals: oxygen therapy, hyperbaric oxygen therapy (hyperbaric medicine)
- by water: hydrotherapy, oral rehydration therapy
- by genes: gene therapy in epilepsy, osteoarthritis, Parkinson's disease
- by proteins: protein therapy
- by hormones: hormone therapy, hormone replacement therapy
- by stem cells: stem cell therapy
- by food and dietary choices: medical nutrition therapy

10.24 Concepts related to diagnosis

Sub-types of diagnoses include:

10.24.1 Clinical diagnosis:

A diagnosis made on the basis of medical signs and patient-reported symptoms, rather than diagnostic tests

10.24.2 Laboratory diagnosis:

A diagnosis based significantly on laboratory reports or test results, rather than the physical examination of the patient. For instance, a proper diagnosis of infectious diseases usually requires both an examination of signs and symptoms, as well as laboratory characteristics of the pathogen involved.

Radiology diagnosis: A diagnosis based primarily on the results from medical imaging studies. Green stick fractures are common radiological diagnoses.

Principal diagnosis: The single medical diagnosis that is most relevant to the patient's chief complaint or need for treatment. Many patients have additional diagnoses.

Admitting diagnosis: The diagnosis given as the reason why the patient was admitted to the hospital; it may differ from the actual problem or from the *discharge diagnoses*, which are the diagnoses recorded when the patient is discharged from the hospital.

Differential diagnosis: The process of identifying all of the possible diagnoses that could be connected to the signs, symptoms, and lab findings, and then ruling out diagnoses until a final determination can be made.

10.25 Diagnostic criteria:

Designates the combination of signs, symptoms, and test results that the clinician uses to attempt to determine the correct diagnosis. They are standards, normally published by international committees, and they are designed to offer the best sensitivity and specificity possible, respect the presence of a condition, with the state-of-the-art technology.

10.26 **Prenatal diagnosis:** Diagnosis work done before birth

10.27 **Diagnosis of exclusion:**

A medical condition whose presence cannot be established with complete confidence from history, examination or testing. Diagnosis is therefore by elimination of all other reasonable possibilities.

10.28 Dual diagnosis:

The diagnosis of two related, but separate, medical conditions or co-morbidities; the term almost always refers to a diagnosis of a serious mental illness and a substance addiction.

10.29 Self-diagnosis:

The diagnosis or identification of a medical conditions in oneself. Self-diagnosis is very common.

10.30 Remote diagnosis:

A type of telemedicine that diagnoses a patient without being physically in the same room as the patient.

10.31 Nursing diagnosis:

Rather than focusing on biological processes, a nursing diagnosis identifies people's responses to situations in their lives, such as a readiness to change or a willingness to accept assistance.

10.32 **Computer-aided diagnosis:**

Providing symptoms allows the computer to identify the problem and diagnose the user to the best of its ability. Health screening begins by identifying the part of the body where the symptoms are located; the computer cross-references a database for the corresponding disease and presents a diagnosis.[17]

10.33 Over diagnosis:

The diagnosis of "disease" that will never cause symptoms, distress, or death during a patient's lifetime

10.34 Wastebasket diagnosis:

A vague, or even completely fake, medical or psychiatric label given to the patient or to the medical records department for essentially non-medical reasons, such as to reassure the patient by providing an official-sounding label, to make the provider look effective, or to obtain approval for treatment. This term is also used as a derogatory label for disputed, poorly described, overused, or questionably classified diagnoses, such as pouchitis and senility, or to dismiss diagnoses that amount to over medicalisation, such as the labelling of normal responses to physical hunger as reactive hypoglycaemia.

10.35 Retrospective diagnosis: The labelling of an illness in a historical figure or specific historical event using modern knowledge, methods and disease classifications.

10.36 Summary

Medical speciality is a branch of medical practice that is focused on a defined group of patients, diseases, skills, or philosophy. Ex: children (paediatrics), cancer (oncology), laboratory medicine (pathology), or primary care (family medicine). After completing MBBS, doctors usually further their medical education in a specific specialty of medicine or surgery by completing a three year post graduate course to become a specialist.

A further subdivision is **the diagnostic versus therapeutic specialties**. While the diagnostic process is of great importance in all specialties, some specialists perform mainly or only diagnostic examinations, such as pathology, clinical neurophysiology, and radiology. This line is becoming somewhat blurred with interventional radiology, an evolving field that uses image expertise to perform minimally invasive procedures.

10.37 Key Words: Medical Speciality, Pathology, clinical pathology, Cytopathology, Neuropathology, Indication, Therapy

Medical speciality: Medical speciality is a branch of medical practice that is focused on a defined group of patients, diseases, skills, or philosophy. Ex: children (paediatrics), cancer (oncology), laboratory medicine (pathology), or primary care (family medicine).
Pathology : Pathology (from the Greek roots of pathos, meaning "experience" or "suffering", and -logia , "study of") is a significant component of the causal study of disease and a major field in modern medicine and diagnosis.
Clinical Pathology: Clinical pathology is the diagnosis of disease through the laboratory analysis of bodily fluids and tissues.
Cytopathology: Cytology is a branch of pathology that studies free cells or tissue fragments to diagnose diseases like cancer etc.
Neuropathology: Neuropathology is the study of disease of nervous system tissue, usually in the form of either surgical biopsies or sometimes whole brains in the case of autopsy. Neuropathology is a subspecialty of anatomic pathology, neurology, and neurosurgery.
Indication: A disease, symptom, or particular set of circumstances that make a particular test, medication, procedure, or surgery advisable. For a treatment, an indication refers to the use of that treatment in treating a particular disease.

Therapy: A therapy or medical treatment is the attempted remediation of a health problem, usually following a medical diagnosis. As a rule, each therapy has indications and contraindications.

10.38 Self-Assessment Questions.
1) Write the notes on the following
   a) Clinical pathology
   b) Forensic pathology
   c) Histopathology

2) Briefly explain Clinical, diagnostic and therapeutic terms used in hospitals

10.39 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-11

PAEDIATRICS AND ENT

OBJECTIVE

To understand about Paediatrics and ENT
To know different types of sub specialties in Paediatrics
To know treatment in ENT
To understand some key facts about ENT in India

Structure of the lesson

11.1 Introduction to Paediatrics

It is the branch of medicine that involves the medical care of infants, children, and adolescents. A medical practitioner who specializes in this area is known as a **pediatrician**, or **paediatrician**. The word *pediatrics* mean "healer of children"; they derive from two Greek words :(*pais* "child") and (*iatros*" doctor, healer"). Pediatricians work both in hospitals, particularly those working in its subspecialties such as neonatology, and as primary care physicians.

Pediatricians are doctors who look at specific health issues, diseases and disorders related to stages of growth and development. This is an area of medicine where the doctor

works closely with the patient and their family. Paediatrics is a diverse, stimulating and hugely rewarding specialty. A paediatrician can work in:

- General paediatric units seeing a wide range of conditions affecting children
- Community-based settings managing long-term care of children and young people
- Highly specialised units working in a wide range of sub-specialties such as neonatal medicine

Paediatrics is a broad-based specialty which allows doctors to be generalists and see children and young people with a wide range of illnesses and disease or to become very specialised in certain areas.

11.2 Differences between adult and pediatric medicine

- The smaller body of an infant or neonate is substantially different physiologically from that of an adult.
- Congenital defects, genetic variance, and developmental issues are of greater concern to pediatricians than they often are to adult physicians. A common adage is that children are not simply "little adults". The clinician must take into account the immature physiology of the infant or child when considering symptoms, prescribing medications, and diagnosing illnesses.
- A major difference between the practice of pediatric and adult medicine is that children, in most jurisdictions cannot make decisions for themselves. The issues of guardianship, privacy, legal responsibility and informed consent must always be considered in every pediatric procedure.
- Pediatricians often have to treat the parents and sometimes, the family, rather than just the child.
- Adolescents are in their own legal class, having rights to their own health care decisions in certain circumstances. The concept of legal consent combined with the non-legal consent (assent) of the child when considering treatment options, especially in the face of conditions with poor prognosis or complicated and painful procedures/surgeries, means the pediatrician must take in to account the desires of many people, in addition to those of the patient.

11.3 Subspecialties of pediatrics include:

- Adolescent medicine
- Child abuse pediatrics
- Clinical informatics
- Developmental-behavioural pediatrics
- Electrophysiology
- Genetics
- Headache medicine
- Hospice & palliative care
- Neonatology
- Pain medicine
- Pediatric allergy and immunology
- Pediatric cardiology
- Pediatric critical care
- Pediatric emergency medicine
- Pediatric endocrinology
- Pediatric gastroenterology

- Pediatric hematology
- Pediatric infectious disease
- Pediatric nephrology
- Pediatric neuropsychology
- Pediatric oncology
- Pediatric neuro-oncology
- Pediatric pulmonology
- Pediatric rheumatology
- Sleep medicine
- Social pediatrics
- Sports medicine
- Transplant hepatology

11.4 Other specialties that care for children include:

- Child neurology, a specialty in its own right
  - Epilepsy
  - Neuro critical Care
  - Pediatric neuro-oncology
- Child psychiatry, subspecialty of psychiatry
- Pediatric anesthesiology, subspecialty of anesthesiology
- Pediatric dermatology, subspecialty of dermatology
- Pediatric neurosurgery, subspecialty of neurosurgery
- Pediatric ophthalmology, subspecialty of ophthalmology
- Pediatric orthopedic surgery, subspecialty of orthopedic surgery
- Pediatric otolaryngology, subspecialty of otolaryngology
- Pediatric rehabilitation medicine, subspecialty of physical medicine and rehabilitation
- Pediatric surgery, subspecialty of general surgery
- Pediatric urology, subspecialty of urology

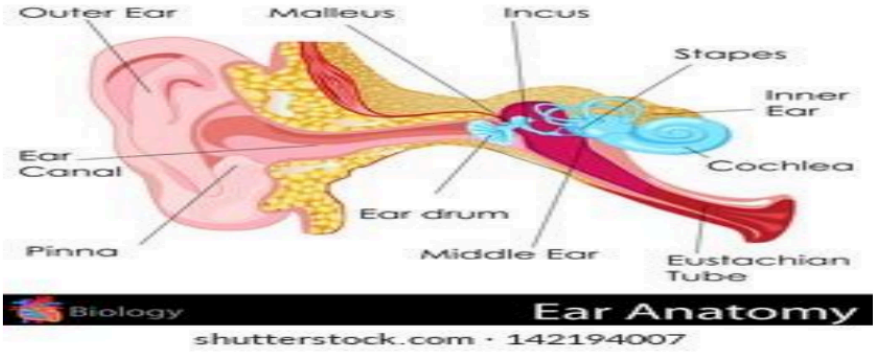
11.5 Requirements of a good pediatrician

- Committed to promoting the welfare of children
- able to be patient, sensitive and empathetic
- approachable and diplomatic
- comfortable with an informal and flexible environment
- good at communicating with a wide range of people
- someone who thrives in a team situation
- fun-loving with a good sense of humor

11.6 E: Ear, Nose and Throat Medical Illustrations

11.6.1 Ear anatomy

The ear is made up of three areas, the external visible portion of the outer ear, also called the pinna. This part is responsible for collecting the vibrations of the air by which sound is produced. There is also the middle ear or tympanic cavity and the inner ear. These parts are not only responsible for detecting sound but they also aid balance and body position.

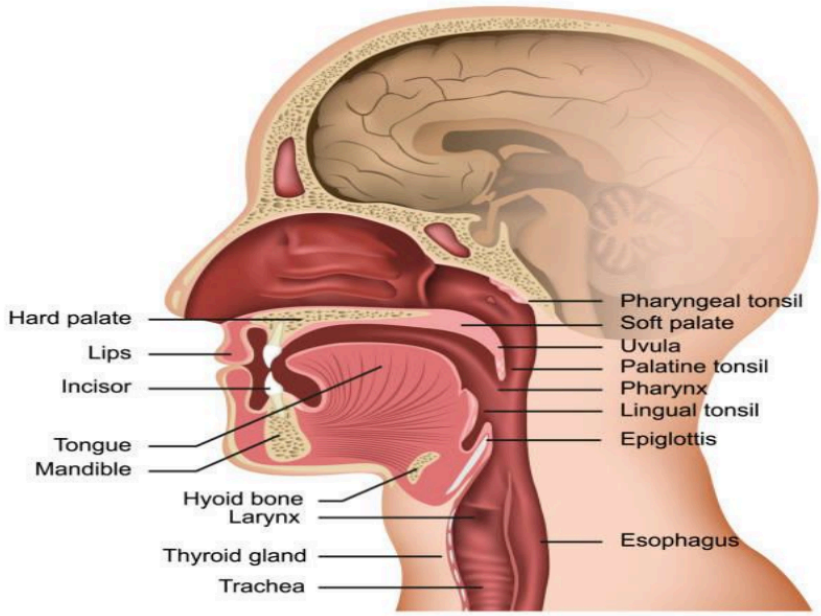


11.7 Nose Anatomy

The nose acts as a respiratory tract and contains the olfactory organ. Made up of parts the visible portion is called the external meatus. Containing two nostrils divided by the septum, these are the chambers from which the air enters into the nose. As the air enters the nose it enters the turbinates and nasal passages. The turbinates help trap particles entering the nasal passages. The sinuses are air-filled cavities which surround the nose.

11.8 Throat Anatomy

The throat is the muscular and cartilage tube that acts as the passageway for air, food and liquid and also helps in forming speech. The throat consists of the larynx, responsible for producing sound; these muscles also allow food to pass down into the oesophagus. The pharynx is considered part of both the respiratory system and the digestive system. The epiglottis is a piece of cartilage that lies above the vocal cords. The adenoids and tonsil are situated here and as they are lymphatic tissues they are part of immune system.



11.9 What Does an ENT do

ENTs deal with anything that has to do with the head, neck, and ears in adults and children, including:

- Hearing
- The adenoids and tonsils
- The thyroid
- The sinuses

- The larynx
- The mouth
- The throat
- Ear tubes
- Ear surgeries
- Cancers of the head, neck, and throat
- Reconstructive and cosmetic surgery on the head and neck

11.10 Treatments:

- Allergic rhinitis
- Cleft palates
- Deafness or age-related hearing loss
- Deviated septum
- Ear deformities
- Eardrum perforation
- Meniere's disease
- Nasal airway obstruction
- Sinusitis
- Snoring and sleep apnea
- Sore throat
- Swollen adenoids
- Throat tumors
- Tinnitus
- Tonsillitis
- Vocal cord and airway disorders

11.11 Some of the most common procedures performed by the ENT Department

- ✓ Cochlear implants
- ✓ Endoscopic nasal surgeries
- ✓ Head and neck cancer surgeries
- ✓ Reconstructive surgeries
- ✓ Skull base surgeries
- ✓ Tonsillectomy
- ✓ Transoral Endoscopic Thyroidectomy
- ✓ Tympanoplasty

11.12 Major ENT Equipment:

- Pure tone and impedance audiometer
- BERA and OAE screening machine
- High end Nasal Endoscopes with camera and recording system for diagnostic and therapeutic nasal endoscopic procedures
- State of the art microscope with camera and recording facility suitable for all microsurgeries of ear and larynx

- Nerve stimulator for intraoperative nerve monitoring
- Adult and paediatric flexible bronchoscopes
- Sonicision for major head neck surgeries
- Highend Microdrill for all ear surgeries

11.13 Some Facts about ENT:

The World Health Organization (WHO) has estimated that unless action is taken, by 2030 there will be nearly 630 million people with disabling hearing loss and by 2050, the number could rise to over 900 million. Currently 466 million people worldwide suffer from disabling hearing loss, 34 million of whom are children. This is up from 360 million people five years ago.1 Symptoms in relation to Ear, Nose and Throat condition usually constitute the major load at Out-Patient Department (OPD) services of any health facility.

In India, the estimated significant auditory impairment reaches up to 6.3% prevalence (moderate to severe hearing loss) out of the total population of 1.25 billion. Common ear problems include ear wax (18.7%), Chronic Suppurative Otitis media (5.4%), dry perforation of Tympanic Membrane (0.6%), Congenital deafness (0.2%) and agerelated hearing loss i.e. presbycusis (10.5%)2. Very limited data is available on the prevalence of nose and throat diseases.

11.14 Summary: It is the branch of medicine that involves the medical care of infants, children, and adolescents. A medical practitioner who specializes in this area is known as a pediatrician, or paediatrician. The word pediatrics mean "healer of children"; they derive from two Greek words :(pais "child") and (iatros" doctor, healer"). Pediatricians work both in hospitals, particularly those working in its subspecialties such as neonatology, and as primary care physicians.

Pediatricians are doctors who look at specific health issues, diseases and disorders related to stages of growth and development. This is an area of medicine where the doctor works closely with the patient and their family. Paediatrics is a diverse, stimulating and hugely rewarding specialty. The Department of Otolaryngology (ENT) deals with a broad spectrum of medical as well as surgical treatments for ear, nose and throat related problems.

11.15 Key Words: ENT, Paediatrics,

Paediatrics: It is the branch of medicine that involves the medical care of infants, children, and adolescents. A medical practitioner who specializes in this area is known as a pediatrician, or paediatrician.

ENT: ENTs deal with anything that has to do with the head, neck, and ears in adults and children,

11.16 Self-Assessment Questions

1) Write in detail about ENT
2) Explain the Paediatrics services available in super speciality Hospital
3) Write the short notes on Differences between adult and pediatric medicine

11.17 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-12
OPHTHALMOLOGY, ORTHOPAEDICS,

OBJECTIVES:

- To understand the ophthalmology
- To know the orthopaedics
- To understand different types of orthopaedic practices
- To study the conditions of the Eyes

Structure

12.1 Introduction to Ophthalmology:

Ophthalmology is the specialized field of medicine that focuses on the health of the eye. It includes the anatomy, physiology and diseases that may affect the eye. Historically, the science of ophthalmology encompassed all aspects of visual function, both in health and in illness.

An ophthalmologist is a specialist physician who is involved with the prevention, diagnosis and medical treatment of the eyes. This may include surgical procedures and pharmaceutical interventions and, as such, ophthalmologists have training in both fields

12.2 History of Ophthalmology:

The known history of ophthalmology dates back to the early days of written history, in which initial observations and speculations about the eye were recorded. Over the ages, the understanding of the anatomy and physiology of the eye continued to develop, and several major breakthroughs took place. This has led to our present state of knowledge of the eyes and ocular health.

12.2.1 Ancient History

In 800 BC, an Indian surgeon named Sushruta described 76 ocular diseases, as well as several ophthalmological techniques and instruments. He was particularly interested in cataract surgery, and has been referred to as the first cataract surgeon.

In ancient times, the anatomical conceptions of the eye were primarily speculatory. The sclera and cornea were understood to form part of the outer layer of the eye, with the pupil and ocular fluid occupying the middle part. This fluid was thought to flow to the brain via a tube. Aristotle introduced empiricism to these fancied structures by dissecting the eyes of animals, and he thus discovered three layers within the eye.

Rufus of Ephesus put forward the concept of a fourth layer, the epithelial layer that covers the eye. He also noted that the eye has two chambers, one filled with water extending from the cornea to the lens, and one filled with viscous fluid occupying the space between the lens and the retina. Galen's studies also made an impact on our understanding of the eye, as he described the anatomy of the cornea, lens and optic nerve. Vesalius further advanced the knowledge of eye structure, with the discovery of the layers of the sclera, retina, choroid and cornea, which meet at a point.

12.2.2. Contemporary History

Throughout the Middle Ages, hand lenses and microscopes were used to study the structure and function of the eye, advancing scientific perception of the organ's anatomy significantly. However, it remained unclear why the pupil changes in size, and what was the nature of the retina. Additionally, the posterior chamber of the eye had not yet been discovered. Some landmarks of this period include:

- Georg Joseph Beer introduced Beer's operation as a treatment for cataract.
- Baron Michael Johann Baptist de Wenzel, who was the oculist of King George III, had remarkable skill at removing cataracts and legitimized the field.
- Ernst Abbe is renowned for the development of various optical instruments used in the field of ophthalmology.
- Hermann von Helmholtz invented the ophthalmoscope in 1851.

The first hospital dedicated to the practice of ophthalmics opened in 1805 in London. It still exists, and is known as Moorfields Eye Hospital. Sir Stewart Duke Elder founded the Institute of Ophthalmology there, which made the hospital the largest eye hospital worldwide.

12.2.3. Modern History

The introduction of the ophthalmoscope in the 19th century brought about a period of consolidation and deepened knowledge of the eye, and treatment of various ocular diseases. This increased the level of precision that was possible in the diagnosis and treatment of ophthalmologic conditions. In particular, the operative treatment of glaucoma was refined at this time, and has helped greatly to improve patient outcomes.

Throughout the 20th century, the investigations in the field of ophthalmology were further expanded. Several subspecialties were introduced to focus on particular areas or diseases of the eye. These include cataract, glaucoma, pediatrics, cornea and oncology subspecializations, among others.

12.3 Conditions of the Eyes

Health conditions that affect the eyes are a core part of practice for most ophthalmologists. Some of the common conditions include.

- Age-related macular degeneration usually affects individuals over the age of 50 and may lead to loss of vision due to damage to the macula.
- Cataracts are the number one cause of vision impairment throughout the world, and cataract surgery is the second most common procedure performed
- Diabetic retinopathy involves damage to the blood vessels in the eyes due to excessive glucose levels in the blood. This can lead to vision impairment.
- Glaucoma is a condition that involves damage to the optic nerve in the eye, which can gradually worsen vision.

OPHTHALMOLOGY in India has a long history. From the days of Sushruta (considered the first surgeion of the world as well as the father of cataract surgery) to the present time, the evolution has been arduous, given all the constraints in which health care has to be delivered. India is a country of a billion people, 70% of whom live in rural areas. The per capita income is only around US $350. More than 10 million Indians are blind. Health care receives less than 2% of the budgetary allocation, and health insurance is virtually nonexistent. The challenge of providing quality eye care under these circumstances is daunting, to say the least. However, Indian ophthalmology has risen to this challenge admirably and today ophthalmic care in India is among the best in the world.

12.4 What is an ophthalmologist?

An ophthalmologist is a medical doctor who specializes in diagnosing and treating eye-related conditions. Three types of eye care specialists have rather similar-sounding names and overlapping job descriptions. It can be confusing at first glance. Here's the difference:

12.4.1 Opticians:

Optician can help you choose frames for your glasses and provide information about types of lenses and lens coatings. They cannot give eye exams, write prescriptions, or diagnose or treat eye problems.

12.4.2. Optometrists:

Optometrists can examine your eyes, test your vision, prescribe glasses or contacts, and diagnose and treat many eye disorders and diseases. They are not medical doctors or surgeons but can prescribe certain eye-related medications.

12.4.3. Ophthalmologists:

Ophthalmologist also provides eye exams, vision testing, and prescriptions for glasses or contact lenses. As medical doctors, they can diagnose and treat any and all eye problems. They can perform eye surgery and provide follow-up care.

12.5 What Does an Ophthalmologist Do?

When giving a comprehensive eye exam, an ophthalmologist will assess your vision and, if needed, find your eyeglass/contact lens prescription. They will test how your pupils respond to light, check the alignment of your eyes, and make sure the muscles that move your eyes are working properly. They will look for any early signs of eye problems such as cataracts or glaucoma and examine the back of your eye (retina) and optic nerve. Ophthalmologists diagnose and treat injuries, infections, diseases, and disorders of the eye. Treatments can include medication taken orally (by mouth) or topically (in the eye), surgery, cryotherapy (freeze treatment), and chemotherapy (chemical treatment).

12.6. Orthopaedics

Orthopaedics is a branch of medicine that focuses on the care of the musculoskeletal system. This system is made up of muscles and bones, as well as joints, ligaments, and tendons. A person who specializes in orthopaedics is known as an orthopaedist. Orthopaedists use both surgical and nonsurgical approaches to treat a variety of musculoskeletal issues, such as sports injuries, joint pain, and back problems. The terms orthopaedics was coined in **1741 by Nicholas Andre** the term orthopedia is composite of 2 Greek words.

"Orthos means straight and paidios means child" orthopaedics literally means "Straight child."

Orthopaedics is a branch of medicine that focuses on the care of the skeletal system and its interconnecting parts. These parts include the:

- bones
- muscles
- joints
- tendons
- ligaments

An orthopedist often works as part of a larger orthopedic treatment team. This team may include:

- physician assistants
- nurse practitioners
- occupational and physical therapists
- athletic trainers

Orthopedists treat a wide variety of musculoskeletal conditions. These conditions may be present from birth, or they may occur as a result of injury or age-related wear and tear.
Below are some of the most common conditions that an orthopedist may treat:

- joint pain from arthritis
- bone fractures
- soft tissue (muscle, tendon, and ligament) injuries
- back pain
- neck pain
- shoulder pain and problems, such as bursitis
- carpal tunnel syndrome
- overuse and sports injuries, including tendinitis, meniscus tears, and anterior cruciate ligament (ACL) tears
- congenital conditions, such as clubfoot and scoliosis

Sub-Specialties in orthopedic include : General ,Pediatric Orthopedic ,Sport and ,Reconstructive Orthopedic, Orthopedic Trauma, Arthroplasty (Joint Replacement), Spinal Surgery ,Foot and Ankle surgery, Oncology, Hand Surgery, Upper Limb.

12.7 Diagnosis:

In order to help diagnose a person's condition, the orthopedist will:

- ask about the person's symptoms
- review the person's medical record to gather more information about their medical history and overall health
- carry out a physical examination
- review any X-rays conducted before the appointment

The orthopedist may also order additional diagnostic tests. These may include:

- an MRI scan
- a CT scan
- a bone scan
- an ultrasound
- nerve conduction studies
- blood tests

12.8. Types of orthopedic practices

An orthopedist may specialize in a particular branch of orthopedic medicine. These branches are called subspecialties. Some orthopedic subspecialties include:

- hand and upper extremity
- foot and ankle
- musculoskeletal oncology (tumor)
- pediatric orthopedics
- sports medicine
- spine surgery
- trauma surgery
- joint replacement surgery

12.9 Types of operations performed by the orthopaedic surgeons

1. **Total joint replacement:** A total joint replacement (TJR), or arthroplasty, is a surgical procedure that replaces the damaged joint with a prosthesis, which usually consists of some combination of metal and plastic. Total Joint Replacement surgery is one of the most commonly performed elective surgeries in the United States.

2. **Arthroscopic surgery:** Arthroscopic surgery is a minimally invasive procedure that uses a device called an arthroscope to diagnose joint problems. An arthroscope is a long, thin camera that an orthopedic surgeon will insert into a person's joint, most commonly the knee or shoulder. The camera is connected to a video monitor that allows them to see the inside of the joint. By making small additional incisions, the surgeon can use a number of small, thin instruments to fix a wide variety of problems.
3. **Fracture repair surgery:** Sometimes, an orthopedic surgeon needs to perform an operation to repair a more severely broken bone. To stabilize the bone, they can use a number of different types of implants. These include rods, plates, screws, and wires.
4. **Bone grafting surgery:** In bone grafting surgery, an orthopedic surgeon uses bone from elsewhere in the body to repair and strengthen diseased or damaged bones. They may also source this bone from another person.
5. **Spinal fusion:** Spinal fusion is a surgical procedure that fuses together adjoining vertebrae of the spine. This procedure allows the vertebrae to heal into a single, solid mass of bone. An orthopedic spine surgeon may perform a spinal fusion for a number of back and neck problems, including injuries to the vertebrae or intervertebral disks and scoliosis.

12.10 Summary: Orthopedics is a medical specialty that focuses on treating injuries and diseases of the musculoskeletal system. Some of these conditions are present at birth, while others may occur as a result of injury or age-related wear and tear. Orthopedists often work as part of a broader orthopedic team that may include physician assistants, nurse practitioners, athletic trainers, and occupational or physical therapists. Together, they help diagnose, treat, and rehabilitate people with musculoskeletal conditions or injuries. All Orthopedists must undergo extensive training in order to obtain their medical license. They must continue ongoing education and training to maintain it.

12.11 Key Words: Ophthalmology, Optician, Optometrists Orthopaedics,

Ophthalmology: Ophthalmology is the specialized field of medicine that focuses on the health of the eye. It includes the anatomy, physiology and diseases that may affect the eye.
Optician: Optician can help you choose frames for your glasses and provide information about types of lenses and lens coatings.
Optometrists: Optometrists can examine your eyes, test your vision, prescribe glasses or contacts, and diagnose and treat many eye disorders and diseases.
Orthopaedics: Orthopaedics is a branch of medicine that focuses on the care of the musculoskeletal system. This system is made up of muscles and bones, as well as joints, ligaments, and tendons. A person who specializes in orthopaedics is known as an orthopaedist.

12.12 Self-Assessment Questions

1) Explain the Ophthalmology services in multispecialty Hospitals
2) Explain different types of operations performed by the orthopaedic surgeons
3) Define Ophthalmology? Explain history of Ophthalmology

12.13 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001

2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-13
DERMATOLOGY, CARDIOLOGY

OBJECTIVES:

- To study the dermatology
- To understand the cosmetic dermatology
- To know about cardiology
- To understand different tests related to cardiology
- To know cardiac care equipment

STRUCTURE

13.1 Dermatology:

Dermatology is the branch of medicine dealing with the skin, nails, hair and its diseases. It is a specialty with both medical and surgical aspects. A dermatologist treats diseases, in the widest sense, and some cosmetic problems of the skin, scalp, hair, and nails.

13.2 Cosmetic dermatology:

Dermatologists have been leaders in the field of cosmetic surgery. This includes the use of botulinum toxin, fillers, and laser surgery. Some dermatologists perform cosmetic procedures including liposuction, blepharoplasty, and face lifts. Most dermatologists limit their cosmetic practice to minimally invasive procedures.

13.3 Dermatopathology:

He is one who specializes in the pathology of the skin. This field is shared by dermatologists and pathologists.

13.4 Immunodermatology:

This field specializes in the treatment of immune-mediated skin diseases such as lupus, bullous pemphigoid, pemphigus vulgaris, and other immune-mediated skin disorders.

13.5 Mohs surgery:

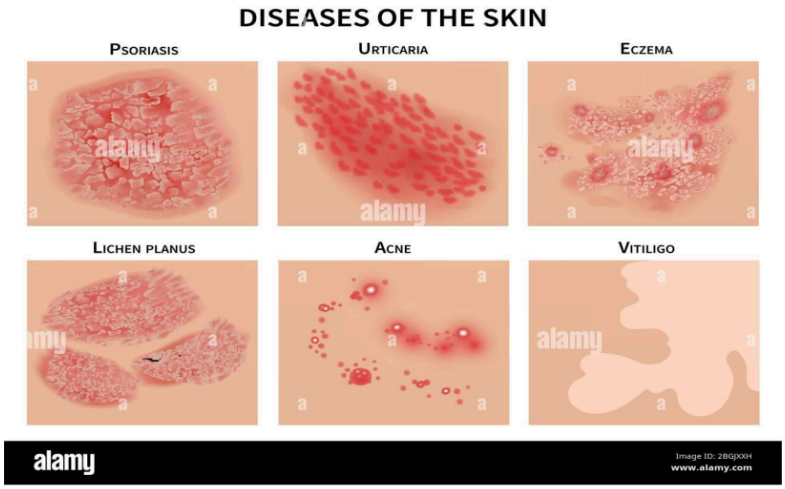
Developed in the 1930s by Dr. Frederic E. Mohs, this dermatologic subspecialty focuses on the excision of skin cancers using a technique that allows intra-operative assessment of 100% of the peripheral and deep tumor margins.

13.6 Pediatric dermatology:

This field encompasses the complex diseases of the neonates, hereditary skin diseases or genodermatoses, and the many difficulties of working with the pediatric population.

13.7 Teledermatology:

It a form of dermatology where telecommunication technologies are used to exchange medical information via all kinds of media (audio, visual and also data communication, but typically photos of dermatologic conditions) usually made by non-dermatologists for evaluation off-site by dermatologists). This subspecialty deals with options to view skin conditions over a large distance to provide knowledge exchange, to establish second-opinion services for experts or to use this for follow-up of individuals with chronic skin conditions. Teledermatology can reduce wait times by allowing dermatologists to treat minor conditions online while serious conditions requiring immediate care are given priority for appointments.



13.8 Dermatoepidemiology:

Dermatoepidemiology is the study of skin disease at the population level. One aspect of dermatoepidemiology is the determination of the global burden of skin diseases.

13.9 Therapies

Therapies provided by dermatologists include, but are not restricted to the following:

- Cosmetic filler injections
- Hair removal with laser or other modalities
- Hair transplantation – a cosmetic procedure practiced by many dermatologists.
- Intralesional treatment – with steroid or chemotherapy.
- Laser therapy – for both the management of birth marks, skin disorders (like vitiligo), tattoo removal, and cosmetic resurfacing and rejuvenation.
- Photodynamic therapy – for the treatment of skin cancer and precancerous growths
- Phototherapy – including the use of narrowband UVB, broadband UVB, psoralen and UVB.
- Tattoo removal with laser.
- Tumescent liposuction – liposuction was invented by a gynecologist. A dermatologist (Dr. Jeffrey A. Klein) adapted the procedure to local infusion of dilute anesthetic called tumescent liposuction. This method is now widely practiced by dermatologists, plastic surgeons and gynecologists.
- Cryosurgery – for the treatment of warts, skin cancers, and other dermatosis
- Radiation therapy – although rarely practiced by dermatologists, many dermatologist continue to provide radiation therapy in their office.
- Vitiligo surgery – Including procedures like autologous melanocyte transplant, suction blister grafting and punch grafting.
- Allergy testing – 'Patch testing' for contact dermatitis.

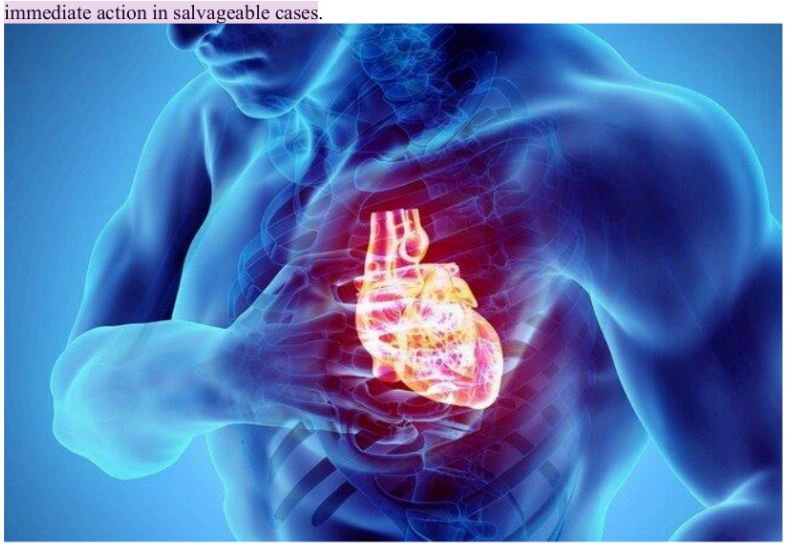
- Systemic therapies – including antibiotics, immunomodulators, and novel injectable products.
- Topical therapies – dermatologists have the best understanding of the numerous products and compounds used topically in medicine.

13.10 Cardiology:

A branch of medicine that specializes in diagnosing and treating diseases of the heart, blood vessels, and circulatory system. These diseases include coronary artery disease, heart rhythm problems, and heart failure. Cardiology is the study and treatment of disorders of the heart and the blood vessels. A person with heart disease or cardiovascular disease may be referred to a cardiologist.

13.11. Cardiac arrest:

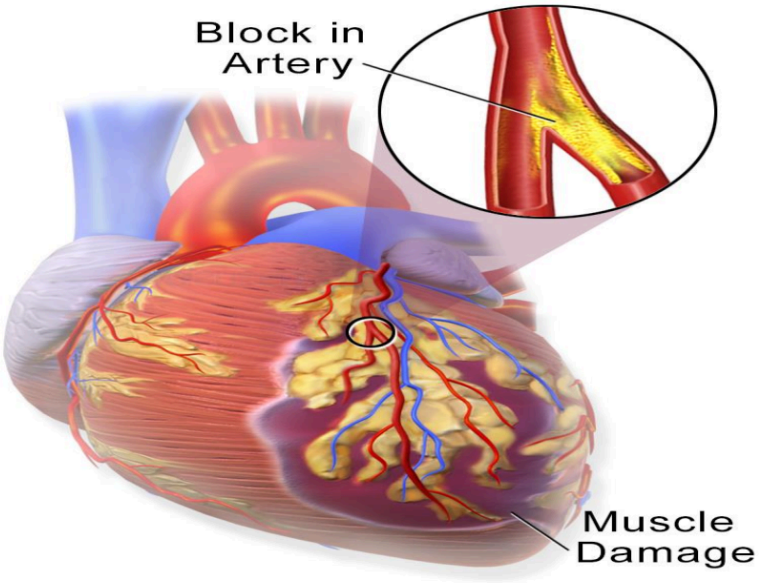
Cardiac arrest may occur in the ED/A&E or a patient may be transported by ambulance to the emergency department already in this state. Treatment is basic life support and advanced life support as taught in advanced life support and advanced cardiac life support courses. This is an immediately life-threatening condition which requires immediate action in salvageable cases.



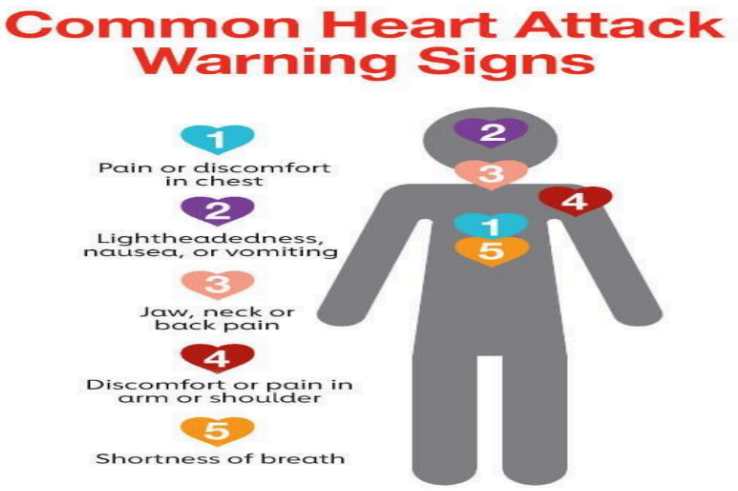
13.12 Heart attack:

Patients arriving to the emergency department with a myocardial infarction (heart attack) are likely to be triaged to the resuscitation area. They will receive oxygen and monitoring and have an early ECG;

An ECG that reveals ST segment elevation or new left bundle branch block suggests complete blockage of one of the main coronary arteries. These patients require immediate reperfusion (re-opening) of the occluded vessel by thrombolysis (clot-busting medication) or Percutaneous Transluminal Coronary Angioplasty (PTCA). This may involve transfer to a nearby facility with facilities for angioplasty.



Heart Attack



13.13 Symptoms that can indicate a heart problem include:

- shortness of breath
- dizziness
- chest pains
- changes in heart rate or rhythm
- high blood pressure

A cardiologist can carry out tests for a heart murmur or an abnormal heart rhythm.

They often treat patients who have had a heart attack, heart failure, or other heart problems. They help make decisions about heart surgery, heart catheterization, and angioplasty and stenting.

Heart diseases that a cardiologist can help with include:

- atherosclerosis
- atrial fibrillation
- arrhythmias
- congenital heart disease
- coronary heart disease
- congestive heart disease
- high blood cholesterol and triglycerides
- hypertension
- pericarditis
- ventricular tachycardia
- high blood pressure, or hypertension

The cardiologist can give advice about preventing heart disease.

A person may need to see a cardiologist even without symptoms, if they have a family history of heart disease or high cholesterol, if they are or have been a smoker, if they have diabetes, or if they are starting a new exercise program.

A woman who has had pre-eclampsia may be at higher risk of heart problems in a later pregnancy or during the menopause.

13.14 Tests: They may also carry out or order tests as listed below:

- **Electrocardiogram (ECG or EKG)**: this records the electrical activity of the heart.
- **Ambulatory ECG**: this records heart rhythms while the person carries out exercise or their regular activities. Small metal electrodes are stuck on to the chest, and these are connected by wires to a Holter monitor, which records the rhythms.
- **An exercise test, or stress test**: this shows the changes of heart rhythm when resting and exercising. It measures the performance and limitations of the heart.
- **Echocardiogram**: this provides an ultrasound picture that shows the structure of the heart chambers and surrounding areas, and it can show how well the heart is working. Echocardiography can measure how well the heart is pumping blood, known as cardiac output. It can detect inflammation around the heart, known as pericarditis. It can also identify structural abnormalities or infections of the heart valves.
- **Cardiac catheterization**: a small tube in or near the heart collects data and may help relieve a blockage. It can take pictures and check the functioning of the heart and the electrical system. Catheter-based techniques with fluoroscopy can be used to treat congenital cardiac, valvular, and coronary artery diseases.
- **Nuclear cardiology**: nuclear imaging techniques use radioactive materials to study cardiovascular disorders and diseases in a noninvasive way.

13.15 Cardiac care Equipment

- Patient Monitors
- EKG Machine

- Cath Lab/Angio
- Tables – Fluoroscopy
- C-Arm Fluoroscopy Machines
- Cardiac ultrasound
- Defibrillators
- Ballon Pumps
- Heart-Lung Bypass
- Stress test system
- Infusion Pumps
- Diagnostics
- Vascular Doppler
- AEDs
- Surgical Equipment
- Operation theatre table

13.16 Qualities of a Good Cardiologist

1. **Knowledge-Based Confidence:** When it comes to something as potentially serious as your cardiovascular care, you don't want your healthcare providers to be timid or overly cautious. Confidence is a key characteristic to seek in your cardiologist, but there is a caveat to that quality. Arrogance and cockiness are not admirable qualities in any professional, let alone in the person to whom you trust your heart health. There's a fine line between those negative qualities and comforting confidence, so look for a cardiologist who has the knowledge to support and justify confidence.

2. **Compassion:** Compassion is a key quality in any healthcare provider, as it takes a special sort of person to help heal others and shoulder their burdens in what may be a difficult time. It's even more important for those who practice cardiology, as often those who are seeking cardiological care are doing so under adverse and potentially life-threatening circumstances. Look for a caring cardiologist who has a vested interest in the continuing health and positive outcomes of his or her patients and can understand the challenges faced by those who suffer from cardiovascular disease and stroke

3. **Specialized Skills:** Have you ever heard the phrase that someone is a jack of all trades but a master of none? That maxim can apply to cardiological services, as there are several sub-specialties that fall beneath the banner of cardiology as a discipline. Some cardiologists may attempt to offer too many lines of service without being a master of any single one. It's better to find a team of cardiologists who each have a specialty or area of focus. That narrowed focus allows the physician to become a true expert and provide you with a higher level of care.

4. **A Doctor and a Teacher**: While the chief responsibility of your cardiologist is to provide you with preventive and reactive care related to the heart, to accomplish that goal, your physician should also be an educator. Many aspects of a heart-healthy lifestyle revolve around lifestyle amendments such as moving more, managing one's weight, giving up tobacco, mitigating high stress levels, and eating the right kinds of nutrients from natural sources. The cardiologist, therefore, must not simply be a

dispenser of care, but also a teacher who instructs patients how to adopt healthier lifestyles and secure better future health.

13.17. Summary: Dermatology is the branch of medicine dealing with the skin, nails, hair and its diseases. It is a specialty with both medical and surgical aspects. A dermatologist treats diseases, in the widest sense, and some cosmetic problems of the skin, scalp, hair, and nails.

Cardiology is **a medical specialty and a branch of internal medicine concerned with disorders of the heart**. It deals with the diagnosis and treatment of such conditions as congenital heart defects, coronary artery disease, electrophysiology, heart failure and valvular heart disease

13.18 Key Words:, Dermatology, Immunodermatology, Cardiology Echocardiogram

Dermatology: Dermatology is the branch of medicine dealing with the skin, nails, hair and its diseases. It is a specialty with both medical and surgical aspects. A dermatologist treats diseases, in the widest sense, and some cosmetic problems of the skin, scalp, hair, and nails.

Immunodermatology: This field specializes in the treatment of immune-mediated skin diseases such as lupus, bullous pemphigoid, pemphigus vulgaris, and other immune-mediated skin disorders.

Cardiology: Cardiology is the study and treatment of disorders of the heart and the blood vessels. A person with heart disease or cardiovascular disease may be referred to a cardiologist.

Echocardiogram: this provides an ultrasound picture that shows the structure of the heart chambers and surrounding areas, and it can show how well the heart is working. Echocardiography can measure how well the heart is pumping blood, known as cardiac output

13.19 Self-Assessment Questions

1) Explain the cardiology services available in Hospital
2) Briefly explain the symptoms of Cardiac arrest
3) write the short notes on the following
   a) Cosmetic dermatology
   b) Dermatopathology
   c) Immunodermatology

13.20 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.

4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-14

Principles and methods of organizing, clinical and support services for Hospitals

OBJECTIVES:

- To understand the concept of Health
- To know about Hospital
- To understand list of departments in Hospitals
- To know the principles and methods of organizing clinical and non-clinical departments

STRUCTURE

14.1 Definition of Health:

Health is the one of those terms which most people find it difficult to define, although they are confident of its meaning. Therefore, many definitions of health have been offered from time to time.

14.2 WHO definition:

The widely accepted definition of health is that given by the world health organization (WHO in 1948) in the preamble to its constitution, which is as follows "Health is state of complete physical, mental, and social well-being". And nor is it "merely the absence of disease or infirmity

14.3 About Hospital:

Hospital is an organization of public health. It is an institution which takes care of the health and diseases of people with the help of sophisticated equipment and instruments, by a group of specially trained persons.

As many people think hospital is not only a place where sick people are taken care off; it also looks after the health or wellbeing of the people and maintains it. It tries to keep them in good health and disease free by undertaking immunization, educational program and by teaching personal and social hygienic practices.

14.4 List of Departments in a Hospital

Hospital is an integration of several departments such as clinical departments, nursing departments, supportive departments, technical departments and administrative departments.

Each department has a different purposes and requirements in hospital. The lists of different departments in a hospital are as follows……

14.4.1. Clinical Departments in a Hospital

- Casualty department
- Operating theatre(OT)
- Intensive care unit(ICU)
- Anaesthesiology department
- Cardiology department
- ENT department
- Geriatric department
- Gastroenterology department
- General surgery
- Gynaecology department
- Haematology department
- Paediatrics department
- Neurology department
- Oncology department
- Ophthalmology department
- Orthopaedic department
- Urology department
- Psychiatry department
- Inpatient department(IPD)
- Outpatient department(OPD)

14.4.2. List of Supportive (Non Clinical) Departments in Hospital

- Pharmacy department
- Radiology department
- Clinical pathology department
- Nutrition and dietetics
- Catering and food services
- CSSD
- Housekeeping
- Technical Departments in a Hospital
- Clinical engineering department
- Information technology and communication
- Engineering services
- Administrative Departments in a Hospital
- Medical records department (MRD)
- Bio Medical waste management (BMW)
- Fire and safety
- Bio Medical Engineering (BME)
- Hospital stores
- Marketing and Branding
- Information Technology (IT)
- Human resources department
- Finance department
- Administrative department

14.5 Principles and methods of organizing clinical and non-clinical departments in hospital

High-quality health services involve the right care, at the right time, responding to the service users' needs and preferences, while minimizing harm and resource waste. Quality health care increases the likelihood of desired health outcomes and is consistent with seven measurable characteristics: effectiveness, safety, people centeredness, timeliness, equity, integration of care and efficiency. Quality does not come automatically; it requires planning, and should be a clearly identified priority of universal health coverage, along with access, coverage and financial protection.

In any Hospital to achieve quality healthcare the clinical and nonclinical (supportive) departments playing very vital role, hence systematic organizing clinical and non-clinical departments and its integration is very much important in hospital

Nonclinical and clinical-support personnel serve patients on the front lines of care. Their service interactions have a powerful influence on how patients perceive their entire care experience, including the all-important interactions with clinical staff. Ignoring this reality means squandering opportunities to start patients out on the right foot at each care visit. Medical practices can improve the overall care they provide by focusing on nonclinical and clinical-support services in 5 crucial ways:

- creating strong first impressions at every care visit by prioritizing superb front-desk service;
- thoroughly vetting prospective hires to ensure that their values and demeanor align with the organization's;
- preparing hired staff to deliver excellent service with a commitment to ongoing training and education at all staff levels;
- minimizing needless delays in service delivery that can overburden patients and their families in profound ways; and
- prioritizing the services that patients consider to be most important. Apart from this the following methods are more suitable for effective management of clinical and non-clinical departments in hospitals.

➢ **Patient Focus**: In any healthcare system in 21st century patient is very prominent person, therefore when patient comes to hospital both clinical and non-clinical departments together in providing healthcare to the patient as it leads to patient satisfaction. "justification integrated delivery systems is to meet patients' needs rather than providers'". Organizations that fail to place the patient at the centre of their integration efforts are unlikely to succeed. Patient focus is reflected by population-based needs assessments that drive service planning and information management and the desire to redesign internal processes to improve patient satisfaction and outcomes. Services demonstrate market sensitivity and responsiveness to changing needs of the population, ensuring the patient receives the "right care at the right place at the right time". This requires a thorough understanding of the way in which patients move within and between different health and social care providers integrated health systems should be easy for patients to navigate, and the importance of involving and being representative of the communities served has been stressed. Patient engagement and participation is desired, and consumers are presented with opportunities for input on various levels. It may be challenging for large integrated systems to retain a patient focus, prompting one author to recommend that smaller systems may have better chances at success.

➢ **Training of Hospital Staff:** New staff and existing staff introduced to the hospital must be competent hospital managers. Hospital staff should be encouraged to participate in

ongoing training to enhance their skills. Current staff should, therefore, be trained in both management and technology, with training also being offered in-house

- **Organizational Culture and Leadership**: Implementation and operation of an integrated health system requires leadership with vision as well as an organizational culture that is congruent with the vision. Clashing cultures, such as differences between providers of medical services and long-term care services, or between physicians and other service providers, is one of the reasons named for failed integration efforts. Another cultural barrier to integration is an acute care mindset, which places the hospital at the centre of the integration process. This runs counter to the concept of integrated, population-based health-care delivery. Bringing different cultures together demands committed and visible leadership with clear communication processes. Leaders need to promote the new vision and mission of integration among their staff to help them take ownership of the process. Successful leaders recognize the importance of learning and how it contributes to the overall integration goal. They ensure opportunities, resources, incentives and rewards for staff learning and enable providers to take the time to obtain additional training.

- **Performance Management**: The success of integrated health systems is felt to depend on well-developed performance monitoring systems that include indicators to measure outcomes at different levels. Performance management involves a structured approach to analysis of performance issues and how they might be addressed. There are protocols and procedures that reflect the importance of measuring care processes and outcomes and using the information for service improvement. The focus is often on cost-effectiveness. Ongoing measurement of care outcomes and reporting are important parts of the quality improvement process. Some integrated health systems have mechanisms in place that link compensation to indicator-based performance; reward systems may be redesigned to identify, measure and reinforce achievement of organizational priorities and promote the delivery of cost-effective high-quality care.

- **Standardized Care Delivery through Interprofessional Teams**: Standardized care delivered by interprofessional teams promotes continuity of the care process. Within effective interprofessional teams, all professionals are considered equal members; professional autonomy is maintained, and incentives are provided to meet performance and efficiency standards. Roles and responsibilities of all team members are clearly identified to ensure smooth transitions of patients from one type of care to another. Shared protocols based on evidence, such as best practice guidelines, clinical care pathways and decision making tools, are essential to the functioning of interprofessional teams and help to standardize care across services and sites, thus enhancing quality of care. While an interprofessional team approach is considered a basic tenet of integration, barriers to team collaboration are plentiful. Confusion or lack of role clarity, professional self-interest, competing ideologies and values, lack of mutual trust and conflicting views about client interests and roles challenge the collaborative process. Closely related to the issue of interprofessional collaboration is communication. Barnsley et al. emphasize the importance of "an organic structure with diverse communication channels that efficiently transfer information across organizational boundaries". Frequent team meetings and the use of electronic information systems facilitate effective communication.

- **Comprehensive Services across the Continuum of Care**: One principle of integrated health systems is the comprehensive scope of clinical and health related services covered. Integrated health systems assume the responsibility to plan for, provide/purchase

and coordinate all core services along the continuum of health for the population served. This includes services from primary through tertiary care as well as cooperation between health and social care organizations.

- **Governance Structure**: Bringing clinical and non-clinical departments together organizations and services into an integrated health system through contractual relationships or networks typically requires development of governance structures that promote coordination. Governance must be diversified, ensuring representation from a variety of stakeholder groups that understand the delivery of healthcare along its continuum, including physicians and the community.

14.6 Summary: In any Hospital to achieve quality healthcare the clinical and nonclinical (supportive) departments playing very vital role, hence systematic organizing of clinical and non-clinical departments and its integration is very much important in hospital. Nonclinical and clinical-support personnel serve patients on the front lines of care. Their service interactions have a powerful influence on how patients perceive their entire care experience, including the all-important interactions with clinical staff. Ignoring this reality means squandering opportunities to start patients out on the right foot at each care visit. Many hospital just positioning them self as Patient centred hospital, if the hospital wants to achieve patient satisfaction certainly the hospital should maintain clinical and non-clinical departments in a systematic manner.

14.7 Key Words: Hospital Clinical Practice, non-clinical Practices

Hospital: Hospital is an organization of public health. It is an institution which takes care of the health and diseases of people with the help of sophisticated equipment and instruments, by a group of specially trained persons.
Clinical practice: Any work undertaken by a doctor that relates to the care of an individual patient
Non-clinical practice: Any work undertaken by a doctor that does not relate to the care of an individual patient

14.8 Self-Assessment Questions

1) Give an account of role of Supportive (non clinical) departments
2) What methods should you recommend for organizing clinical and non-clinical departments in hospital?
3) explain the role of Mio medical waste and CSSD in Hospital

14.9 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.

4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

LESSON-15
ROLE OF SUPPORT SERVICES IN HOSPITAL FUNCTIONING

OBJECTIVE:

- To understand the role of Non-clinical departments in hospital
- To know about Housekeeping
- To study about CSSD
- To understand the role of security in Hospital

Structure of the lesson

15.1 About Hospital:

Hospital is an organization of public health. It is an institution which takes care of the health and diseases of people with the help of sophisticated equipment and instruments, by a group of specially trained persons. As many people think hospital is not only a place where sick people are taken care off; it also looks after the health or wellbeing of the people and maintains it. It tries to keep them in good health and disease free by undertaking immunization, educational program and by teaching personal and social hygienic practices.

15.2. List of Departments in a Hospital

Hospital is an integration of several departments such as clinical departments, nursing departments, supportive departments, technical departments and administrative departments.

Each department has a different purposes and requirements in hospital. The lists of different departments in a hospital are as follows……

15.2.1. List of Clinical Departments in a Hospital

- Casualty department
- Operating theatre(OT)
- Intensive care unit(ICU)
- Anaesthesiology department
- Cardiology department
- ENT department
- Geriatric department
- Gastroenterology department
- General surgery
- Gynaecology department
- Haematology department
- Paediatrics department
- Neurology department
- Oncology department
- Ophthalmology department
- Orthopaedic department
- Urology department
- Psychiatry department
- Inpatient department(IPD)
- Outpatient department(OPD)

15.2.2. List of Supportive (Non Clinical) Departments in Hospital

- Pharmacy department
- Radiology department
- Clinical pathology department
- Nutrition and dietetics
- Catering and food services
- CSSD
- Housekeeping
- Technical Departments in a Hospital
- Clinical engineering department
- Information technology and communication
- Engineering services
- Administrative Departments in a Hospital
- Medical records department (MRD)
- Bio Medical waste management (BMW)
- Fire and safety
- Bio Medical Engineering (BME)
- Hospital stores
- Marketing and Branding
- Information Technology (IT)
- Human resources department
- Finance department
- Administrative department

15.3 Role of supportive or (non-clinical) service in Hospital

Support services in hospital are the services which are not directly related to patient care, but indirectly contribute in patient management or auxiliary service in a hospital are activities which are neither directly related to care, no support care, but contribute to facilitate the services. they have a crucial role in **mitigation of infection and delivery of safe care to the patients**. The spectrum of hospital supportive services encompasses linen & laundry, dietary, Central Sterile Supply Department (CSSD), transport hospital stores, mortuary and engineering services

The spectrum of supportive services in hospital

- Radiology services
- Laboratory services
- Central Sterile Supply Department (CSSD),
- linen and laundry,
- Dietary,
- Transport,
- Hospital stores,
- Bio Medical Waste (MBW)
- Bio Medical Engineer
- Blood Bank
- Quality
- Mortuary and engineering
- Pharmacy
- Medical records
- Administrative services
- Housekeeping services
- Fire and Safety services
- Information Technology
- Human Resource
- Hospital back office
- Marketing and branding
- Insurance etc.

15.3.1 CSSD

The Central Sterile Supply Department in a hospital is an integral part of infection control. Every hospital should follow the standard sterilisation practices for all hospital supplies.

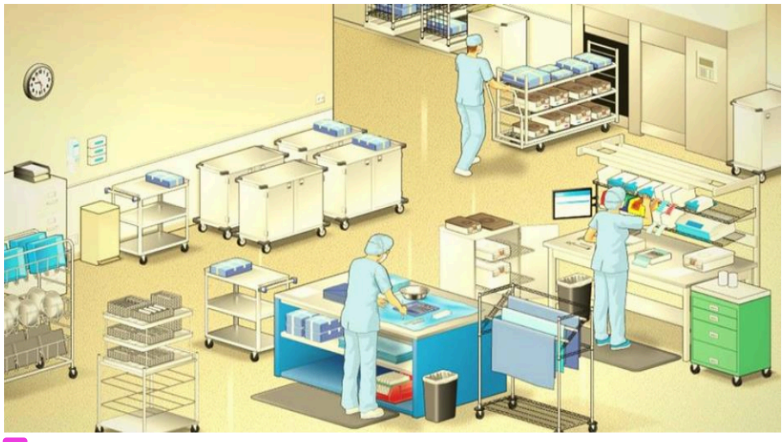
Disinfection: It is the process of reducing the number of pathogenic micro organisms to the point where they no longer cause diseases.

Sterilisation: It is an absolute process where even the spores are also eliminated.

Disinfectant: Applied to inanimate objects

Antiseptic: Applied to living tissue.

Sanitization: Use of chemical agents on food handling equipment to meet public health standards and minimize chances of disease transmission.



Infection control is the discipline concerned with preventing nosocomial or healthcare-associated infection. It is an essential, though often under recognized part of the infrastructure of health care. Infection control addresses factors related to the spread of infections within the healthcare setting:

- Whether patient-to-patient, from patients to staff and from staff to patients, or among-staff
- Including prevention (via hand hygiene / hand washing, cleaning / disinfection / sterilization, vaccination, surveillance
- Monitoring/investigation of demonstrated or suspected spread of infection within a particular health-care setting (surveillance and outbreak investigation)
- Management (interruption of outbreaks)

Infection control in hospitals: Aseptic technique is a key component of all invasive medical procedures. Similarly, infection control measures are most effective when Standard Precautions (health care) are applied because undiagnosed infection is common.

Hand hygiene: Independent studies established a link between the hands of health care workers and the spread of hospital-acquired disease. It is well documented that the most important measure for preventing the spread of pathogens is effective hand washing.

Employers must provide readily accessible hand washing facilities, and must ensure that employees wash hands and any other skin with soap and water or flush mucous membranes with water as soon as feasible after contact with blood or other potentially infectious materials.

Drying is an essential part of the hand hygiene process. Comparing the bacteria levels present after the use of paper towels, warm air hand dryers, and modern jet-air hand dryers, only paper towels reduced the total number of bacteria on hands.

Sterilization: Sterilization is a process intended to kill all microorganisms and is the highest level of microbial kill that is possible. Sterilizers may be heat only, steam, or liquid chemical. Effectiveness of the sterilizer (e.g., a steam autoclave) is determined in three ways.

- First, **mechanical indicators** and gauges on the machine itself indicate proper operation of the machine.
- Second **heat sensitive indicators** or tape on the sterilizing bags change color which indicate proper levels of heat or steam. And,
- Third (most importantly) is biological testing in which a microorganism that is highly heat and chemical resistant (often the bacterial endospore) is selected as the **standard challenge**. If the process kills this microorganism, the sterilizer is considered to be effective. It should be noted that in order to be effective, instruments must be cleaned, otherwise the debris may form a protective barrier, shielding the microbes from the lethal process. Similarly care must be taken after sterilization to ensure sterile instruments do not become contaminated prior to use.

Sterilization, if performed properly, is an effective way of preventing bacteria from spreading. It should be used for the cleaning of the medical instruments or gloves, and basically any type of medical item that comes into contact with the blood stream and sterile tissues.

There are four main ways in which such items can be sterilized:

- autoclave(by using high-pressure steam),
- dry heat(in an oven),
- by using chemical sterilants such as glutaraldehydes or formaldehyde solutions or
- by radiation(with the help of physical agents)

The first two are the most used methods of sterilizations mainly because of their accessibility and availability.

Steam sterilization is one of the most effective types of sterilizations, if done correctly which is often hard to achieve. Instruments that are used in health care facilities are usually sterilized with this method. The general rule in this case is that in order to perform an effective sterilization, the steam must get into contact with all the surfaces that are meant to be disinfected.

Steam sterilization is done at a temperature of 121 C (250 F) with a pressure of 106 kPa (15 lbs / in^2). In these conditions, unwrapped items must be sterilized for 20 minutes, and wrapped items for 30 minutes. The time is counted once the temperature that is needed has been reached. Steam sterilization requires four conditions in order to be efficient:

1. adequate contact,
2. sufficiently high temperature,
3. correct time and
4. sufficient moisture

Sterilization using steam can also be done at a temperature of 132 C (270 F), at a double pressure.

Dry heat sterilization, which is performed with the help of an oven, is also an accessible type of sterilization, although it can only be used to disinfect instruments that are made of metal or glass. The very high temperatures needed to perform sterilization in this way are

able to melt the instruments that are not made of glass or metal. Dry heat sterilization is performed at 170 C (340 F) for one hour or two hours at a temperature of 160 C (320 F). Dry heat sterilization can also be performed at 121 C, for at least 16 hours.

Chemical sterilization, also referred to as cold sterilization, can be used to sterilize instruments that cannot normally be disinfected through the other two processes described above. The items sterilized with cold sterilization are usually those that can be damaged by regular sterilization. Commonly, glutaraldehydes and formaldehyde are used in this process, but in different ways. When using the first type of disinfectant, the instruments are soaked in a 2-4% solution for at least 10 hours while a solution of 8% formaldehyde will sterilize the items in 24 hours or more. Chemical sterilization is generally more expensive than steam sterilization and therefore it is used for instruments that cannot be disinfected otherwise.

After the instruments have been soaked in the chemical solutions, they are mandatory to be rinsed with sterile water which will remove the residues from the disinfectants. This is the reason why needles and syringes are not sterilized in this way, as the residues left by the chemical solution that has been used to disinfect them cannot be washed off with water and they may interfere with the administered treatment. Although formaldehyde is less expensive than glutaraldehydes, it is also more irritating to the eyes, skin and respiratory tract and is classified as a potential carcinogen.

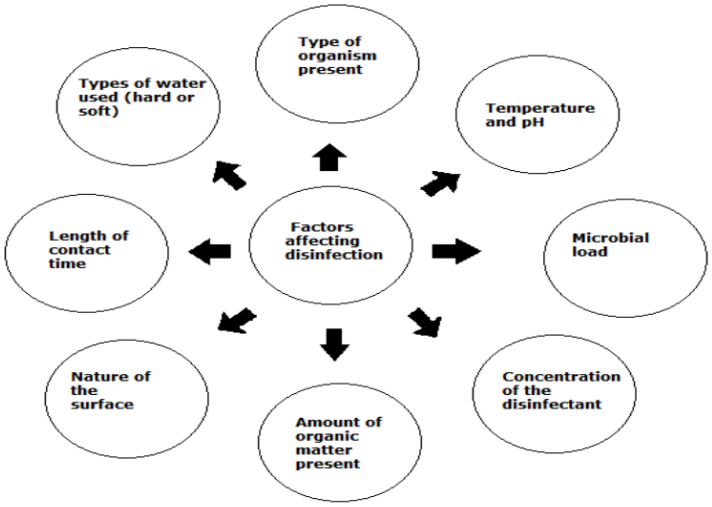
Other sterilization methods exist, though their efficiency is still controversial. These methods include gas, UV, gas plasma, and chemical sterilization with agents such as peroxyacetic acid or para formaldehyde.

Cleaning: Infections can be prevented from occurring in homes as well. In order to reduce their chances to contract an infection, individuals are recommended to maintain a good hygiene by washing their hands after every contact with questionable areas or bodily fluids and by disposing of garbage at regular intervals to prevent germs from growing.

15.3.2 Disinfection:

Disinfection uses liquid chemicals on surfaces and at room temperature to kill disease causing microorganisms. Ultraviolet light has also been used to disinfect the rooms of patients infected with *Clostridium difficile* after discharge. Disinfection is less effective than sterilization because it does not kill bacterial endospores.

Factors affecting disinfection:



15.4 HOUSEKEEPING:

It may be simply be defined as "Provision of clean, comfortable, safe & aesthetically pleasing environment". "Housekeeping is a support service department in a hospital, which is responsible for cleanliness, maintenance & aesthetic upkeep of patient care areas, public areas and staff areas". It is also known as sanitation department/ sanitation section/ sanitation services etc.

No environment requires more cleanliness than that of a hospital. The scare of germs from hospital waste and other sources is enough to force a hospital's administration to hire many people for housekeeping services. Hospital housekeepers maintain a sterile environment throughout the hospital that they are working for. They make beds, handle waste management duties and replenish linen along with a bevy of other housekeeping duties.

Hospital housekeeping services: The hospital housekeeping services comprises of activities related to cleanliness, maintenance of a healthy environment and good sanitation services, keeping the hospital premises free from pollution. In short it is the service directed towards a clean, safe and mentally comfortable environment.

- To impart hygienic environment
- To meet expectations of the community
- To maintain a high reputation of the hospital

AIMS OF HOUSE KEEPING: To provide a Happy, Healthy, Safe and Pollution free environment built on a strong and sustainable programme to the customers who visits the hospital, specially the patients & their relatives.

15.4.1 OBJECTIVES OF HOUSEKEEPING

- To attain and maintain high standards of cleanliness and general upkeep.
- To train, control and supervise staff under its establishment.
- To attain good relations with other departments.
- To ensure safety and security of all staff under its department and to keep superior authorities informed about day to day activities.
- Control and issue of cleaning materials and equipment.
- To maintain official records on staffing, cleaning materials and equipment.
- General Sanitation, cleanliness and comfortable environment.
- Developing courteous, reliable and congenial atmosphere.
- Adequate support of motivated staff.
- Good interdepartmental cordial relation.
- Ensuring safety of staff, patient and relatives.
- Quality control of sanitary equipments and cleaning agents.

15.4.2 COMPONENTS OF HOUSEKEEPING

- Greenery
- Comfort
- Adequate Water Supply
- Clean & Appealing Toilets
- Sanitation & Cleanliness
- Proper Disposal Of Bio medical wastes
- Hospital Infection Control
- Pest & Rodent Control
- Odor Control
- Appealing Interior (Indicators, Lighting, Designing)
- Proper Sewerage Disposal

15.4.3 OUT COME OF GOOD HOUSEKEEPING

- Great Patient Satisfaction
- More Visit Of Patients
- Increase Popularity
- Prevent & Control Infection
- Enhances Public Relation
- Reduce Average Length Of Stay
- Reduction In Cost Of Medical Care
- Reduce Patient Suffering

15.4.4 TYPES OF HOUSEKEEPING

IN HOUSE SERVICES

- Hospital Employed Staff on regular basis.
- Services managed by hospital sanitation staff.
- Hospital Resources

OUT SOURCING OF HOUSEKEEPING

- Consultant Expertise
- Service on contract
- Facility consultant
- Hospital Supervision
- Sanitation Expertise
- Better Service
- Cost Containment

STAFFING REQUIREMENTS

One housekeeping staff for 1400 sq ft floor area, One Supervisor for 10 HK staff, One HK for 10 hospital bed/ 1200-1500 sq ft.

15.4.5 TRAINING NEEDS TRAINING NEED OF CLEANING PERSONAL

- Hygiene & Health Examination
- Method of Equipments
- Maintenance of Equipment
- Use of Reagents
- Benefit of Cleaning
- Personal Protection

SELECTION OF CLEANING AGENT

- Mild in Nature
- Pleasant Odour
- Good Quality
- Non Corrosive
- Bactericidal
- Wide Microbe Spectrum

15.4.6. AREAS TO BE CLEANED

1. Floor Cleanser - 3 in each shift/ week
2. Fans - Wet Mopping One in two weeks
3. AC - Vacuum Cleaning Once in two weeks/ once a week
4. Refrigerator - 2% Gluteraldehyde Defrost cleaning with soap Once in two weeks
5. Sinks - Clean so Daily Once
6. Buckets - Soap Water Daily
7. Window panes - Mopping Daily
8. Doors/ Pelmets - Mopping Daily
9. Toilets Mirror, Basin Pots - Cleaning with detergent Three times daily
10. Machine Cleaning Scrubbing Once a week

15.4.7. RECENT TREND IN HOUSEKEEPING

- Mechanized Cleaning
- Closed, Leak Proof Bio Medical Waste Transport System
- Elimination of Unpleasant Odour
- Control of Noise
- Control of Infection Through CSSD
- Appealing Colors of Walls & Corridors

- Evaluation of Detergents
- Facility Consultant

Challenges:

- Low priority activity
- Overcrowding
- Financial constraints
- Manpower shortage
- Unwilling supervision
- Lack of awareness

15.5 Kitchen and dietary department

Hospital diets are hygienic healthy and nutritious with quality and quantity. The diets are framed and prepared freshly and served in timely manner according to the disease condition of the patient as it is an essential part of medical and surgical treatments. Hospital diets containing right amount of essential nutrients improves physical and mental well-being of patients thus preventing long stay in the hospital.

The dietary department is responsible for ensuring quality food service to patients according to their needs and as prescribed by doctors. It guides patients about the diet they must take after discharge. One dietary staff member is required for 15 to 20 patients. Dietician, food storekeeper, cook, cook helpers and dish washer are engaged in this department. One dietician can look after up to 200 beds. One cook one cook helper, one bearer and one

dishwasher are sufficient to prepare meals for 20 patients and staff members. The food service department functions round the year.

15.6 Cleaning and Laundry Department

The cleaning and laundry department takes care of the entire linen used in the hospital. It has the following functions:

- washing dirty linen
- repairing torn linen
- replacing condemned linen

One laundry operator can wash linen of 25–30 beds. One laundry orderly can assist in washing the linen of 50– 60 beds. The appointment of laundry supervisor, mechanic and clerk, and the number of staff employed depends upon the size of a hospital. One supervisor, one laundry mechanic and one laundry clerk are required in each shift. One washerman can take care of 150–200 kg linen per day. Each operation in an Operation Theatre produces 7–8 kg of soiled linen. Each delivery in a labour room produces 7–8 kg of soiled linen. Each ward patient produces about 5–6 kg of bed linen.

15.7 Purchasing Department

The purchasing department has the responsibility of purchasing all supplies, (excluding food), a equipment for the hospital.

The main goal of any hospital purchasing department is to deliver high-quality goods and solutions at the best price. They play a central role in negotiating, soliciting bids, and creating purchase orders. They also review requisitions for goods and services from various departments. A hospital purchasing agent will spend a significant amount of time analysing price proposals, financial reports, and other data to determine fair market pricing.

- Day-to-day activities and responsibilities include:
- Negotiating or renegotiating contracts
- Administering contracts with suppliers and vendors
- Monitoring shipments of purchased goods
- Executing sales or other financial transactions
- Analyzing data to maintain budgetary restraints

15.8 Medical Record Department:

Medical Records is a systematic documentation of a patient's medical history and care given. It serves as a basis for planning patient care, documenting communication between the health care provider and any other health professionals contributing to the patient care, assisting in protecting the legal interest of the patient and the health care providers responsible for the patients care. It is an essential part of a hospital or a healthcare setup which primarily stores records of the patients who have been either treated in the OPD (Out Patient Department), IPD (Inpatient Patient Department) or Emergency Unit of the hospital.

s.no	Color	Type of transaction
1	Green	Aarogyasri
2	Yellow	Insurnace & Credit
3	Pink	Cash transactions

5.9 Security

Unlike other health care employees, the Hospital Security Officer makes no product and provides no treatment to patients. However, the Security Officer is a very visible hospital employee. Most people entering a hospital for the first time feel uneasy, if not scared. This fear can be lessened considerably when they are greeted by professional Security Officers who offer help, clear directions, and, most importantly, a safe environment where they can receive care.

- He often greets patients when they enter the facility.
- His main duty is to protect people, property, information, and reputation.
- He responds rapidly to security emergencies within the hospital or health care setting.
- He also may help people into and out of their cars, receive hospital deliveries at night, and escort patients as needed.
- He has typically completed a basic security officer's program covering subjects from laws of arr to weapon safety.
- He reports to a shift supervisor, operations chief, or hospital security supervisor.
- He usually becomes involved with patients when assistance is requested by medical or nursing staff, or when patients or their families ask for assistance or information.

Functions: The Hospital Security Officers are charged with protecting:

- people
- property
- information
- reputation
- **Preventive patrol or inspectional service** is the method employed by Security Officers to determine that conditions are normal in a given area and to provide a visible deterrent factor. This function takes on greater importance at night by providing a feeling of safety for staff, patients, and visitors. While on patrol, Security Officers routinely turn lights off as an energy conservation measure. They also check windows and doors to afford better protection to building occupants and to safeguard unoccupied buildings.
- **Rapid response to security emergencies within the hospital**: This is an especially important function of Security Officers with respect to hospital staff is their rapid response to security emergencies within the hospital. Whether for psychiatric or medical reasons, patients sometimes become violent or threaten medical or nursing staff. Resident medical doctors and staff should never put themselves or other staff at risk in these situations but should immediately call for Security Officers' assistance in subduing or restraining such patients.
- **External emergencies**: Security Officers may also be called upon for external emergencies, such as assisting in providing aid for disaster victims.
- **Giving directions and assistance:** Security Officers give directions to hospital patients and visitors. They may also help people into and out of their cars, or assist them with dead car batteries. Security Officers may also be involved in receiving hospital deliveries at night and escort duties.

Security Officers spend a good deal of their time enforcing the rules and regulations of the hospital, which is one of their primary responsibilities.

Training: Most Hospital Security Officers complete at least a basic security officer's program. These programs can run as long as 24 hours and cover subjects ranging from laws of arrest to weapon safety. Many of the basic training courses are tailored to individual hospital needs. In recent years, a number of states have mandated requirements for Security Officers, and most states have mandated requirements for weapon training.

Supervision: The Hospital Security Officer may report to a shift supervisor, operations chief, or hospital security supervisor. All security staff ultimately report to a hospital's security director.

A typical day at the hospital for a Security Officer will include:

Post/patrol duty:

- providing protection, assistance, and control
- monitoring activity in and around an assigned area
- being alert for suspicious activity
- enforcing access to the property and regulating removal of equipment
- patrolling the hospital and reporting findings
- Information reporting:
- gathering, compiling, recording, and reporting information
- reporting security or safety hazards
- treating all information as confidential and respecting everyone's right to privacy

Situation response:

- responding appropriately to routine and emergency situations in a timely manner
- evaluating a situation and taking appropriate steps to resolve it in a professional manner
- using only necessary force, as appropriate to the situation
- providing traffic control, when necessary
- monitoring a given situation until completed
- acting with restraint, not allowing emotions to dictate actions and/or reactions

Licensing: No licensing is required for the Hospital Security Officer. However, any type of weapon used by that Security Officer must be licensed, and the Officer must be certified to carry that weapon (baton, firearm, etc.).

Security Officers become involved with patients when their assistance is requested by medical or nursing staff or when patients or their families approach them for some form of assistance or information.

Hospital security guard job description: A hospital security guard ensures the safety of the hospital within the hospital premises. He helps in evacuation drives in times of fire and other threats. The job involves checking the incoming and outgoing vehicles to curb illegal transport of drugs and other hospital paraphernalia.

Hospital security guard duties and responsibilities: The duties and responsibilities of a hospital security guard are:

- Patrolling the hospital premises and identifying suspicious activity
- Ensuring that the security arrangements in the hospital like computers, alarm systems and close circuit cameras are functioning properly
- Researching new methods of hospital security and recommending upgrading of the existing system
- Placing miscreants under citizen's arrest until he can be handed over to the law enforcement officials
- Interact with hospital staff of all divisions with special emphasis on drug storage areas, infant care units, ward for mentally ill patients and trauma care
- In case of fire or bomb threats, taking charge of evacuating the hospital

- Forming a liaison between the hospital and law enforcement agency

The skills and specifications of a hospital security guard are:

- Should be alert and have excellent observation skills
- Ability to take swift and efficient action in times of emergency
- Should be bold and courageous to deal with miscreants
- Should have a thorough knowledge of the floor plan of the hospital including all the normal and emergency entry and exit points
- Should have good communication and analytical abilities
- Should have a good knowledge about the rules and regulations of the hospital
- Hospital security guard education and qualification
- A high school diploma is necessary to obtain the job of a hospital security guard along with a security guard and weapon-handling license from the state.

15.20 Finance and accounts department

The finance and accounts department has the responsibility of collecting money, paying for the supplies and equipment, handling all records pertaining to hospital finance, keeping records of assets and liabilities, and assist in budget preparation. The business manager is responsible for the functions of the department and the accountants help the business manager. A GDA serves as the missing link between all supporting departments, in addition to her/his main duty of patient care.

15.21 Personnel Department

It is responsible for individual care of the staff and this department is headed by an officer who is qualified in personal administration

Functions of Personnel Department:

a) Recruitment: Seeking of new job or an appointment to fill the vacant post in an organization
b) Interviewing: personal one to one communications between the employer and the employee
c) Promotion or transfers
d) Termination of employees
e) Safety
f) Remuneration and incentives
g) Health programmes
h) Recreation: a source for relaxation

15.22 Bio-Medical Waste:

The waste produced in the course of health-care activities carries a higher potential for infection and injury than any other type of waste. Therefore, it is essential to have safe and reliable method for its handling. Inadequate and inappropriate handling of health-care waste may have serious public health consequences and a significant impact on the environment. Appropriate management of health-care waste is thus a crucial component of environmental health protection, and it should become an integral feature of health-care services.

Definition: According to Bio-Medical Waste (Management and Handling) Rules, 1998 of India, "Bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or in research activities pertaining thereto or in the production or testing of biologicals.

27

Between 75 to 90 per cent of the waste produced by the health-care providers is non-risk or "general" health-care waste, comparable to domestic waste. It comes mostly from administrative and housekeeping functions of the health-care establishments, and may also include waste generated during maintenance of health-care premises. The remaining 10-25 per cent health-care waste is regarded as hazardous and may create a variety of health risk

103

Average composition of hospital waste in India: (wet-weight basis)
Paper 15%, Plastics 10%, Rags 15%, Metal (sharps etc.) 1%, Infectious waste 1.5%
Glass 4.0 %, General waste (food waste, sweepings from hospital premises etc.) 53.5%

27

A survey done in Bangalore revealed that the quantity of solid wastes generated in hospitals and nursing homes generally varies from 1/2 to 4 kg per bed per day in Govt. hospitals, 1/2 to 2 kg per bed per day in private hospitals, and 1/2 to 1 kg per bed per day in nursing homes. The total quantity of hospital wastes generated in Bangalore is about 40 tonnes per day. Out of this nearly 45 to 50 per cent is infectious. Segregation of infectious wastes from non-infectious wastes is done only in about 30 per cent of hospitals

Colour codes of Bio Medical Waste Management

Without the supportive departments in a hospital providing quality healthcare is not possible, therefore the role of supportive departments playing very important role in creating patient satisfaction in any hospital.

15.23 Summary: The role of the Support services in hospital are the services which are not directly related to patient care, but indirectly contribute in patient management or auxiliary service in a hospital are activities which are neither directly related to care, no support care, but contribute to facilitate the services. they have a crucial role in **mitigation of infection and delivery of safe care to the patients**. The spectrum of hospital supportive services encompasses linen & laundry, dietary, Central Sterile Supply Department (CSSD), transport hospital stores, mortuary and engineering services, without these service it is not the possible to the hospital.

15.24 Key Words: Non clinical department, Disinfection, infection control, sterilization

Non-Clinical or Supportive or auxiliary Department: Support services in hospital are the services which are not directly related to patient care, but indirectly contribute in patient management or auxiliary service in a hospital are activities which are neither directly related to care, no support care, but contribute to facilitate the services.

Disinfection: It is the process of reducing the number of pathogenic microorganisms to the point where they no longer cause diseases.

Infection control is the discipline concerned with preventing nosocomial or healthcare-associated infection. It is an essential, though often under recognized part of the infrastructure of health care. Infection control addresses factors related to the spread of infections within the healthcare setting

Sterilization: Sterilization is a process intended to kill all microorganisms and is the highest level of microbial kill that is possible.

15.25 Self-Assessment Questions

1) Describe the role of Central sterile supply department in Hospitals

2) List out few supportive department in hospital and explain its role in hospital functioning

3) Elucidate the importance of dietary services in hospitals

15.26 Suggested for Further Readings:

1. **Mogli GD**: Medical Records, Organization and Management, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2001
2. **Francis CM, Mario C de Souza**: Hospital Administration, Jaypee brothers Medical Publishers (P) Ltd., New Delhi, 2000.
3. **GD Mogli**: Health Records Paper to Paper less, Jaypee Brothers Medical Publishers (p) ltd, New Delhi, 2015.
4. **Rambabu D**, Reality of Hospital Administration, Jaypee Brothers Medical Publishers (P) Ltd., New Delhi, 2014.
5. **BM Sakharkar**, Principles of Hospital Administration and Planning –Jaypee brothers Publications.

105HA26

ORIGINALITY REPORT

30%	29%	8%	23%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	en.wikipedia.org Internet Source	5%
2	www.medicalnewstoday.com Internet Source	2%
3	www.thailandmedical.news Internet Source	1%
4	makehealthyindia.in Internet Source	1%
5	anucde.info Internet Source	1%
6	ecfmg.org Internet Source	1%
7	dunuasidafajatmi.blogspot.com Internet Source	1%
8	www.slideshare.net Internet Source	1%
9	www.pbmchealth.org Internet Source	1%
10	insuranceflag.com Internet Source	1%
11	www.eiilmuniversity.co.in Internet Source	1%
	www.webmd.com	

12	Internet Source	1 %
13	www.nursesclass.com Internet Source	<1 %
14	www.bestsamplejobdescription.com Internet Source	<1 %
15	www.uniteforsight.org Internet Source	<1 %
16	elispot.biz Internet Source	<1 %
17	www.bspublications.net Internet Source	<1 %
18	www.medical-artist.com Internet Source	<1 %
19	www.nagarjunauniversity.ac.in Internet Source	<1 %
20	Submitted to Mercer University Student Paper	<1 %
21	www.flu.ofertyseks.kutno.pl Internet Source	<1 %
22	Submitted to RMIT University Student Paper	<1 %
23	Leonard L. Berry, Katie A. Deming, Tracey S. Danaher. "Improving Nonclinical and Clinical-Support Services: Lessons From Oncology", Mayo Clinic Proceedings: Innovations, Quality & Outcomes, 2018 Publication	<1 %
24	Submitted to Western Governors University Student Paper	<1 %

25	studyres.com Internet Source	<1 %
26	kontactr.com Internet Source	<1 %
27	archive.org Internet Source	<1 %
28	meddic.jp Internet Source	<1 %
29	dictionnaire.sensagent.leparisien.fr Internet Source	<1 %
30	Submitted to DeVry, Inc. Student Paper	<1 %
31	Kavya Sharma, Sanjay Zodpey. "Demand and Supply Analysis of Human Resource Capacity for Hospital Management in India", Journal of Health Management, 2011 Publication	<1 %
32	ab-hwc.nhp.gov.in Internet Source	<1 %
33	www.scribd.com Internet Source	<1 %
34	www.craighospital.org Internet Source	<1 %
35	www.thehansindia.com Internet Source	<1 %
36	Submitted to Kaplan University Student Paper	<1 %
37	Gullapalli N. Rao. "Ophthalmology in India", Archives of Ophthalmology, 2000	<1 %

	Publication	
38	Submitted to 76830 Student Paper	<1 %
39	www.ruralhealthweb.org Internet Source	<1 %
40	Danielle C. Ompad, Sandro Galea, David Vlahov. "Urban Health Systems: Overview", Elsevier BV, 2017 Publication	<1 %
41	pt.scribd.com Internet Source	<1 %
42	ayurvedhatips.blogspot.com Internet Source	<1 %
43	courseware.cutm.ac.in Internet Source	<1 %
44	www.rcpch.ac.uk Internet Source	<1 %
45	www.aiu.edu.sy Internet Source	<1 %
46	idoc.pub Internet Source	<1 %
47	www.ncbi.nlm.nih.gov Internet Source	<1 %
48	www.apollohospitals.com Internet Source	<1 %
49	Submitted to Southern New Hampshire University - Continuing Education Student Paper	<1 %
50	www.heliosderm.com Internet Source	<1 %

51	trumpmdmsadmissions.blogspot.com Internet Source	<1 %
52	mohfw.gov.in Internet Source	<1 %
53	Submitted to M S Ramaiah University of Applied Sciences Student Paper	<1 %
54	www.npr.org Internet Source	<1 %
55	www.ijic.info Internet Source	<1 %
56	Submitted to University of Venda Student Paper	<1 %
57	www.apollospectra.com Internet Source	<1 %
58	Submitted to Aligarh Muslim University, Aligarh Student Paper	<1 %
59	docshare01.docshare.tips Internet Source	<1 %
60	coverlettersandresume.com Internet Source	<1 %
61	www.coursehero.com Internet Source	<1 %
62	Submitted to Delta Career Education Corporation (Master) Student Paper	<1 %
63	medical.dpu.edu.in Internet Source	<1 %

64	Submitted to Republic of the Maldives Student Paper	<1 %
65	jsshospital.in Internet Source	<1 %
66	Submitted to American Intercontinental University Online Student Paper	<1 %
67	fathermuller.edu.in Internet Source	<1 %
68	www.news-medical.net Internet Source	<1 %
69	Submitted to Universiti Sains Malaysia Student Paper	<1 %
70	N Fitria, E Damanhuri, I R S Salami. "Evaluation of hospital infectious waste management in Bandung region", IOP Conference Series: Earth and Environmental Science, 2018 Publication	<1 %
71	Submitted to Grand Canyon University Student Paper	<1 %
72	wikivisually.com Internet Source	<1 %
73	apfinance.gov.in Internet Source	<1 %
74	Submitted to Saint Francis University Student Paper	<1 %
75	Submitted to Savitribai Phule Pune University Student Paper	<1 %

76	www.omicsonline.org Internet Source	<1 %
77	Submitted to Sioux City Community School District Student Paper	<1 %
78	www.naukribatao.com Internet Source	<1 %
79	Submitted to Jawaharlal Nehru Technological University Student Paper	<1 %
80	Submitted to Higher Education Commission Pakistan Student Paper	<1 %
81	www.tubbyclub.com Internet Source	<1 %
82	Submitted to Brigham Young University Student Paper	<1 %
83	bikehike.org Internet Source	<1 %
84	www.hinfoways.com Internet Source	<1 %
85	Rajmohan. "Phyto-Pharmacognostic and Antihyperlipidemic Activity of Vateria Indica Linn.Seed", Rajiv Gandhi University of Health Sciences (India), 2023 Publication	<1 %
86	lalmatihospital.com Internet Source	<1 %
87	Submitted to Ecole Hoteliere de Lausanne Student Paper	<1 %

88	www.surgicalsci.org Internet Source	<1 %
89	Submitted to Florence-Darlington Technical College Student Paper	<1 %
90	Submitted to Central Christian College Student Paper	<1 %
91	Submitted to University of Auckland Student Paper	<1 %
92	Submitted to Pioneer Pacific College Student Paper	<1 %
93	Submitted to University of South Australia Student Paper	<1 %
94	www.bsesme.com Internet Source	<1 %
95	avantehs.com Internet Source	<1 %
96	dev.tbh.org Internet Source	<1 %
97	Submitted to CSU, Dominguez Hills Student Paper	<1 %
98	en.unionpedia.org Internet Source	<1 %
99	lacliniquitabymenacare.com Internet Source	<1 %
100	www.studentshangout.com Internet Source	<1 %
101	Submitted to CollegeAmerica Services, Inc. Student Paper	<1 %

102	rankly.com Internet Source	<1 %
103	M., Shindhe Maheshkumar. "A Study of Health Care Waste Management in Nagamanagala Taluka of Mandya District", Rajiv Gandhi University of Health Sciences (India), 2023 Publication	<1 %
104	slidetodoc.com Internet Source	<1 %
105	Submitted to Purdue University Student Paper	<1 %
106	"Cancer and Chronic Conditions", Springer Science and Business Media LLC, 2016 Publication	<1 %
107	Submitted to Brown Mackie College Student Paper	<1 %
108	careersdocbox.com Internet Source	<1 %
109	Cornelia Butler Flora, Jan L. Flora, Stephen P. Gasteyer. "Rural Communities - Legacy and Change", Routledge, 2018 Publication	<1 %
110	ebooks.lpude.in Internet Source	<1 %
111	"Antimicrobial Materials for Medical Devices", Kirk-Othmer Encyclopedia of Chemical Technology, 2015. Publication	<1 %
112	Submitted to Hamilton Southeastern Schools Student Paper	<1 %

113	lifelinepanvel.com Internet Source	<1 %
114	raw.githubusercontent.com Internet Source	<1 %
115	K.G. Ramawat. "The Indian Herbal Drugs Scenario in Global Perspectives", Bioactive Molecules and Medicinal Plants, 2008 Publication	<1 %
116	Submitted to North West University Student Paper	<1 %
117	Submitted to Keller Graduate School of Management Student Paper	<1 %
118	Submitted to hcpc Student Paper	<1 %
119	Submitted to International Health Sciences University Student Paper	<1 %
120	www.maitreyahospitals.com Internet Source	<1 %
121	sodel.jnujaipur.ac.in Internet Source	<1 %

Exclude quotes	On	Exclude matches	< 14 words
Exclude bibliography	On		

105HA26

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13

PAGE 14

PAGE 15

PAGE 16

PAGE 17

PAGE 18

PAGE 19

PAGE 20

PAGE 21

PAGE 22

PAGE 23

PAGE 24

PAGE 25

PAGE 26

PAGE 27

PAGE 28

PAGE 29

PAGE 30

PAGE 31

PAGE 32

PAGE 33

PAGE 34

PAGE 35

PAGE 36

PAGE 37

PAGE 38

PAGE 39

PAGE 40

PAGE 41

PAGE 42

PAGE 43

PAGE 44

PAGE 45

PAGE 46

PAGE 47

PAGE 48

PAGE 49

PAGE 50

PAGE 51

PAGE 52

PAGE 53

PAGE 54

PAGE 55

PAGE 56

PAGE 57

PAGE 58

PAGE 59

PAGE 60

PAGE 61

PAGE 62

PAGE 63

PAGE 64

PAGE 65

PAGE 66

PAGE 67

PAGE 68

PAGE 69

PAGE 70

PAGE 71

PAGE 72

PAGE 73

PAGE 74

PAGE 75

PAGE 76

PAGE 77

PAGE 78

PAGE 79

PAGE 80

PAGE 81

PAGE 82

PAGE 83

PAGE 84

PAGE 85

PAGE 86

PAGE 87

PAGE 88

PAGE 89

PAGE 90

PAGE 91

PAGE 92

PAGE 93

PAGE 94

PAGE 95

PAGE 96

PAGE 97

PAGE 98

PAGE 99

PAGE 100

PAGE 101

PAGE 102

PAGE 103

PAGE 104

PAGE 105

PAGE 106

PAGE 107

PAGE 108

PAGE 109

PAGE 110

PAGE 111

PAGE 112

PAGE 113

PAGE 114

PAGE 115

PAGE 116

PAGE 117

PAGE 118

PAGE 119

PAGE 120

PAGE 121

PAGE 122

PAGE 123

PAGE 124

PAGE 125

PAGE 126

PAGE 127

PAGE 128

PAGE 129

PAGE 130

PAGE 131

PAGE 132

PAGE 133

PAGE 134

PAGE 135

PAGE 136

PAGE 137

PAGE 138

PAGE 139

PAGE 140

PAGE 141

PAGE 142

PAGE 143

PAGE 144

PAGE 145

PAGE 146

PAGE 147

PAGE 148

PAGE 149

PAGE 150

PAGE 151

PAGE 152

PAGE 153

PAGE 154

PAGE 155

PAGE 156

PAGE 157

PAGE 158

PAGE 159

PAGE 160

PAGE 161

PAGE 162

PAGE 163

PAGE 164

PAGE 165

PAGE 166

PAGE 167

PAGE 168

PAGE 169

PAGE 170

PAGE 171

PAGE 172

PAGE 173

PAGE 174

PAGE 175

PAGE 176

PAGE 177

PAGE 178

PAGE 179

PAGE 180

PAGE 181

PAGE 182

PAGE 183

PAGE 184

PAGE 185

PAGE 186

PAGE 187

PAGE 188

PAGE 189

PAGE 190

PAGE 191

PAGE 192

PAGE 193

PAGE 194

PAGE 195

PAGE 196

PAGE 197

PAGE 198

PAGE 199

PAGE 200

PAGE 201

PAGE 202

PAGE 203

PAGE 204

PAGE 205

PAGE 206

PAGE 207

PAGE 208

PAGE 209

PAGE 210

PAGE 211

PAGE 212

PAGE 213

PAGE 214

PAGE 215

PAGE 216

PAGE 217